

MEETING ABSTRACTS

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I1 Proceedings of the 4th World Conference on Research Integrity

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The 4th World Conference on Research Integrity was held in Rio de Janeiro, Brazil, May 31-June 1, 2015. The World Conferences were established as global forums for discussion of ideas, policies and empirical findings related to the responsible conduct of research. The Conferences aim to galvanise the global effort to strengthen the trustworthiness and reliability of research and encourage researchers worldwide to be accountable for their findings. Earlier conferences were held in Lisbon (2007), Singapore (2010) and Montréal (2010).

The Rio conference attracted over 470 delegates from 42 countries, including leaders of research institutions and funding agencies, policy makers, editors and publishers, legal experts, researchers and graduate students. The theme of the conference was *Research Rewards and Integrity: Improving Systems to Promote Responsible Research*.

These Proceedings contain the abstracts of the presentations given at the 4th World Conference in concurrent sessions, partner symposia, and poster sessions. Also included are summaries of the discussions in three focus tracks, which allowed delegates to consider and work on questions about the roles of funders, institutions, and countries in improving research systems and strengthening research integrity. Videos of the plenary presentations are available at the conference website (www.wcri2015.org).

The 5th World Conference will be held in Amsterdam, The Netherlands, May 28-31, 2017 (www.wcri2017.org).

Concurrent Sessions

1. Countries' systems and policies to foster research integrity

Chair: Nils Axelsen, Staten Serum Institute, Denmark

CS01.1

Second time around: Implementing and embedding a review of responsible conduct of research policy and practice in an Australian research-intensive university

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS01.1**

The University of Queensland (UQ) is one of the leading research-intensive universities in Australia. UQ first developed formal policy and procedure relating to responsible conduct of research in 2011. The ongoing practical application of the first iteration of these policies identified lack of clarity in procedure with challenges arising from unintended consequences. A significant case of research misconduct in 2013 was a catalyst to commission a comprehensive external review of policy, procedure and practice relevant to research integrity, ethics and compliance in line with the Australian Code for Responsible Conduct of Research (2007). This presentation will

describe the comprehensive strategy arising from this review to improve our policies, our resources, our systems and to ensure the practice of responsible conduct of research sits at the heart of UQ.

Additional funds have enabled us to increase the number and seniority of staff in the Research Integrity Office, to purchase a purpose built complaints management system and the Epigeum online Research Integrity training tool. With a team of experienced research leaders and other key staff we are revising our responsible research policies and developing an education and communication plan to ensure senior staff such as Executive Deans and Heads of Schools are confident in working collaboratively with the Research Integrity Office and that all staff understand their responsibilities under the Australian Code and university policy. We have appointed a team of 16 senior researchers to the roles of Research Integrity Advisors embedded within each Faculty and Institute as a first triage point for people with concerns about the responsible conduct of research.

This is a two year process. We are learning from the past to continuously improve our practice. It is important to maintain the focus on why this is important: our goal is to ensure that research at The University of Queensland is undertaken in an environment in which the key values of the Australian Code, such as honesty and integrity, are embedded within our research culture and practiced as a matter of course. Susan O'Brien leads the Research Integrity Office at The University of Queensland. Her principal role is to promote implementation and practice of responsible conduct of research and a positive research culture and to investigate claims of research misconduct where they arise. In 2015-16 she is Chair of the Group of Eight (Australia's leading research intensive universities) Research Integrity Group.

CS01.2

Measures to promote research integrity in a university: the case of an Asian university

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As a world-class comprehensive university with research activities spanning all major disciplines, the University of Hong Kong realises the vital importance of research integrity. As specified in the Policy on Research Integrity, all members of the University should uphold the highest standard of professional conduct and abide by the University's rules, policies and guidelines, and also by relevant laws.

This presentation reports some of the University's efforts in promoting responsible conduct of research (RCR). Since March 2010, the University has organised regular RCR seminars, which are now mandatory for new staff for the award of internal research support and research postgraduate (RPG) student supervision. The programme covers important research integrity issues including conflict of interest and questionable research practices, existing rules and regulations on ethical compliance, and group discussion of case studies. Fourteen RCR seminars attended by over 1,370 staff have been held to date. To ensure that all staff are

aware of the latest developments in this area, the mandatory requirement has been extended to existing staff in February 2015.

A research integrity (RI) funding scheme was established by the University to encourage Faculties to tailor RI education and training programmes/activities to promote RI awareness. Since 2012/13, the scheme has supported thirteen projects, and the deliverables include faculty retreats, public forums and an RI case booklet. In addition, the University maintains a number of online RCR materials for reference by staff and students. The University is also active in participating in international networks on RI, and it hosted the U21 Workshop on "Dealing with Research Misconduct" in December 2012. To promote RI among RPg students, a compulsory research ethics course for all MPhil and PhD students has been in place since September 2009. A booklet for RPg students on this subject has also been published.

Starting from October 2008, a dedicated senior academic has been appointed by the University Research Committee (URC) to oversee RI education and development. With the increasing work in this area, another senior academic has been appointed by the URC in January 2015 to assist with the work. To strengthen communication with Faculties, since 2009 each Faculty has nominated a liaison person to deal with RI matters.

The presentation concludes by raising some of the challenges faced by the University including disciplinary differences, increasing international research collaboration activities, and the changing international scene of research.

2. Examples of research integrity education programmes in different countries

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CS02.1

Development of a state-run "cyber education program of research ethics" in Korea

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These days, as research and publication of research paper have increased, research misconducts raised constantly. Since 2007, Korea government and academic societies have been tried to enhance research integrity. Government has built up infrastructure that enacted guideline for the establishment of research ethics and launched a center for research ethics information(CRE) to promote voluntary efforts of researchers. Also they have been expanding the opportunities of research ethics education. As part of an ongoing effort, NRF(National Research Foundation of Korea) and KIRD(Korea Institute of Human Resources Development in Science & technology) develop 'Cyber education program of research ethics' step by step.

To promote effectiveness of education, this program is designed by specialized curriculum that classified principal investigator and collaborative researcher individually. And each curriculum consist of basic and advanced courses. In addition, this education will be provide to researcher who supported by NRF Humanities grant. 'Cyber education program of research ethics' will be a special challenge to promote standard of research integrity in Korea.

CS02.3

Responsible conduct of research teachers' training courses in Germany: keeping on drilling through hard boards for more RCR teachers

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS02.3**

As a continuation of our "good scientific practice" courses for doctoral students and postdocs, we developed a teachers' training programme to train academic staff of German universities and research institutions. The major aim is to raise the number of teachers because the enormous demand for RCR courses is obviously going along with a lack of skilled teachers who could provide them. The effect of such a training programme should be twofold: academic teachers become more competent as RCR mentors in their institutions; and there will be more teachers who can offer in-house courses. Furthermore, it could also be a step forward to the development of organization ethics.

We started with three RCR teachers' trainings in 2013 and one in 2014. All trainings were based on the German Research Foundation Memorandum [1], on the local regulations for Safeguarding Good Scientific Practice and on the German Curriculum for Teaching Good Scientific Practice [2]. The main contents were: good scientific practice and scientific misconduct in managing data, in the process of publication and authorship, in mentoring and research cooperation; dealing with conflicts and scientific misconduct; national and local structures for support (ombudssystem); investigative commissions and procedures; and consequences of confirmed scientific misconduct, including potential sanctions.

During the three training modules we trained the participants' didactic skills: development and discussion of cases, problem based learning, small group teaching, plenary discussions, involvement of experts (ombudspersons), and knowledge input. Discussing the roles, interests, duties and temptations of students in the different stages of their education, and of their understanding of the scientific process was always an important issue. A crucial part was a reflexion of the motivations for becoming a scientist, about causes for scientific misconduct, and about the stakeholders in the system of science with their own perspectives.

After the trainings the participants felt encouraged to start designing their own programmes. Yet some doubts about teaching loads and acceptance in their universities remained. The participants' follow-up feedback in 2015 was very reassuring: most of the participants had developed their own programmes in a creative way. The trainings had encouraged them to start teaching and adapt their instruction to the needs and possibilities of their organization.

References

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2. Sponholz G (2012). Curriculum für Lehrveranstaltungen zur Guten wissenschaftlichen Praxis. <http://www.ombudsman-fuer-die-wissenschaft.de>

3. The research environment and policies to encourage research integrity

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CS03.1

Challenges and best practices in research integrity: bridging the gap between policy and practice

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS03.1**

Despite policies and systems that support the promotion of responsible research, there is continued evidence that unethical research practices occur on a fairly regular basis within most organisations. Such practices pose a number of challenges for those responsible for the promotion of responsible research practices. The first and second challenges concern: i) the need for policies and directives that inculcate compliance and ii) education and awareness raising to support adherence to aspects of the directives. The third challenge concerns the monitoring and reporting of unethical research practices, while the fourth challenge concerns the lack of deterrents that

tend to be applied when unethical research practices are found to be deliberate, rather than unintended. Given the latter situation is often preceded by a great deal of effort to uncover a 'chain of evidence', those involved in attempting to inculcate a culture of ethical research within their organisations could well be forgiven for developing an attitude of 'why bother?' Consequently, this presentation focused on how the University of Technology Sydney (UTS) is currently endeavouring to overcome the challenges outlined here by instilling a culture of compliance through policy, systems, processes and education in order to bridge the policy - practice gap. The presentation included a scenario that illustrated several research integrity issues and the ways that institutions could address those issues. It also outlined the research integrity challenges, such as the protection of institutional reputation, minimising harm and avoiding subjectivity, reporting research misconduct, etc. that are likely to be transferable across cultures. From the feedback and discussion following the presentation, it is clear that endeavours to promote ethical research practices need to be ongoing and constant in order to cover both depth and breadth in the quest to instil ethical research cultures within institutions.

CS03.2

The Slovenian initiative for better research: from national activities to global reflections

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The basic postulate of the paper is that the reflections on research/scientific integrity on the national level enrich the understanding and dimensions of this strategic field by introducing historical, gendered, functional, conceptual/linguistic, and governmentality perspectives. As there are differences among national research environments and bodies, and also intellectual traditions, we contribute to the development of the field in diversified ways.

The Slovenian Commission for Women in Science (CWS) – an autonomous expert body at the Slovenian Ministry for Science, Education and Sport took the initiative on the national level to implement and promote the "scientific/research ethics and accountability". The CWS was the force driver in organization of the first international conference entitled »Ethical, Accountability, and Gender Perspectives: New Relations in Science«, which took place on the 19th Sept. 2014 in Ljubljana. We have succeeded to connect STEM and SSH disciplines as regards experiences, knowledge and visions in thematizations of ethics/accountability/integrity in science. The scientific misconduct and unacceptable practices taking place in the Slovenian research environments have been for the first time openly presented and discussed. The important outcome of the conference is the translation of the "Singapore statement" in Slovene and its dissemination at the press conference. In addition, since June 2014 the CWS is representing Slovenia – as an observer in the European network of research integrity offices (ENRIO). The CWS is proactive in formulating the national guidelines on ethics, in organizing the educational courses, and in constituting the research integrity body on the national level.

We have accompanied the Slovenian translation of the Singapore statement by a foreword. It embeds the statement in the Slovenian scientific environment and considers the possible improvements / proliferations. When reflecting the conditions of the contemporary globalized sciences, dominant power relations are exposed: they are construed on the axes of capital, gender, age, scientific disciplines and professional positions, and are detrimental to "scientific integrity". The implementation of gender perspective in the approach to ethical and responsible science reveals the destructive tension between systemic (socio-political ordering) and structural (institutional) options, and the personal inclinations to behave with ethical integrity. Societal power relations are integrated in the mainstream terminology, which could be seen also in the Singapore statement. The

terminological pair "research integrity" would be misleading if there was the common understanding that the principal target are individual researchers, and not those on power positions, whereby behavioural norms are formed.

CS03.3

Organizational climate assessments to support research integrity: background of the Survey of Organizational Research Climate (SOuRCe) and the experience with its use at Michigan State University

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At least since the 2002 Institute of medicine report, "Integrity in Scientific Research: Creating an Environment That Promotes Responsible Conduct," the importance of local research environments as factors influencing behaviors in research has been recognized. Yet until recently, there have been no gold standard measures of local organizational environments and therefore little data has been available to help guide efforts at developing and sustaining local institutional environments that support research integrity.

The recent creation and validation of the Survey of Organizational Research Climates (SOuRCe) has made it possible for the first time to implement a reporting and feedback process that can be used as an integral part of efforts on the part of research organizations to build and sustain organizational climates that foster research integrity. Separate from approaches based on regulation and accreditation or on use of financial incentives (carrots or sticks), the reporting and feedback approach uses data generated from the local environment to inform local leaders of the quality and variability of their local organizational climates.

While some threats to research integrity operate at a systemic level affecting many research organizations in similar ways, other threats are unique to the local situation and are better identified and addressed through processes of organizational introspection. Through providing organizational leaders with such baseline assessments and metrics of organizational features that can be targeted for organizational change efforts, locally tailored initiatives to support and sustain research integrity become possible.

UIUC, in collaboration with Carol Thrush and Brian Martinson, has recently developed a web-based solution usable by research organizations to field the SOuRCe in a cost-effective way among their organizational members. Automated data collection, processing and report generation are designed to minimize the cost hurdles to implementing a quality assessment of organizational climates, while also developing a norming database against which organizational leaders can compare their climates.

Recent developments and activities pertaining to the SOuRCe will be presented, as will specific advice for successfully administering the SOuRCe, understanding SOuRCe results, their application to university units and implications for leaders.

4. Expressions of concern and retractions

Chair: Veronique Kiermer, *Nature*, US

CS04.1

Proposed guidelines for retraction notices and their dissemination

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Retraction notices are an important way by which the scientific literature corrects itself, and in which researchers, journals, and institutions can transparently describe what went wrong. However, many notices are unhelpful and opaque, leaving readers frustrated and often obscuring cases of research misconduct.

While several organizations, including the ICMJE and COPE, provide guidelines for retraction notices, the recent growth in the rates of retraction, particularly among journals that have never retracted papers before, strongly suggests a need for updated and more specific guidelines. The highly variable interpretation of key parts of existing guidelines is a reminder of this.

Drawing on more than four years of experience cataloging in excess of 1,000 retraction notices, the co-founders of Retraction Watch proposed their own guidelines for such notices, including such criteria as:

- What should be included, for example “the reason for retraction using clear, unambiguous language that differentiates misconduct from honest error and avoids euphemisms (e.g., for plagiarism)”What should be avoided, particularly vague and unhelpful language
- Who should write the text
- Appropriate uses of retractions, as opposed to expressions of concern and corrections
- How the retraction should be made available and publicized

CS04.2

Watching retractions: analysis of process and practice, with data from the Wiley retraction archives

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When Wiley works at the request of journal editors to consider and then publish a retraction notice, we follow a standard process. During this process we collect data at various points, including but not limited to: The date that the Wiley team was alerted to the potential need for a retraction; the reason why the retraction is needed; the communication process between the journal editors, publisher, authors and complainants, and the other stakeholders (eg, one or more institutions, another publisher); and the date of publication for the retraction.

In this presentation, we will review and present data collected during investigation and publication of recent retractions at Wiley. As an example of the kind of data we will analyze, on 19 May 2014, a colleague submitted a retraction request on behalf of a journal's editor-in-chief, on grounds of serious error (scientific, ethical, technical), to the retraction review team at Wiley. The article to be retracted was first published on 26 May 2009, the editor-in-chief had agreed with the proposed action (ie, retraction) following investigation by the authors' institution; the authors were informed and had agreed with the proposed action; and the draft retraction statement was written and approved. The retraction was published online on 9 July 2014 [<http://onlinelibrary.wiley.com/doi/10.1111/cei.12398/abstract>].

Examination of how our process performs will yield useful insights. Our aim is to shed light on retraction processes that happen at Wiley, in order to: Enhance transparency around the processes we follow; illustrate the inherent complexity and look for ways to simplify; highlight areas for improvement that might perhaps result in greater speed without loss of the careful examination that retractions require; and draw conclusions that might inform other processes earlier in the life of a research report and therefore which might reduce the need for retractions. Our ultimate goal is to share our lessons with other members of the research integrity community, so that together we can better manage retractions and promote publication of responsible research.

CS04.3

An exploratory content analysis of Expressions of Concern

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Research Integrity and Peer Review 2016, **1(Suppl 1):**CS04.3

Introduction

Evidence indicates that most retractions are due to misconduct (Fang, et al 2012), but that some retraction notices are not specific as to the factors (often misconduct) that led to the retraction (Resnik & Dinse, 2013). In addition, the structure of retraction notices has also been found to differ widely across journals (Billbrey, et al 2014). Because articles that receive Expressions of Concern (EoCs) are sometimes later retracted and because there is no analogous literature on the characteristics of EoCs, it was felt that exploring this form of scientific communication was a worthwhile pursuit.

Method

The search term 'expression of concern' was entered in the PubMed database (N = 275 items as of May 10th, 2015) of which 123 were of some type of EoC. Only 'editorial' EoCs were selected, that is, only those entries with headings, such as 'expression of concern' and 'statement of concern' that were published by the journal's editor (N = 95) were included. Of the 95 EoCs, 3 were behind a pay wall, but only one could not be freely obtained for inclusion in the analysis.

Results

The earliest editorial EoC appearing in PubMed was published in 1977. It must be noted, however, that many biomedical journals have, since their inception, published letters to the editor whose purpose is often to indicate problematic issues with published articles. The 95 EoCs covered a total of 124 individual journal articles and averaged 283.96 words in length (Sd = 420.6; Mdn = 154). The time interval between publication of article and EoC ranged from 0 to 21 years (M = 4.78; Sd = 4.07; Mdn = 4). Approximately 42 % of the EoCs concerned issues with methodology, data analysis, including issues with data samples and tissues, or with problematic conclusions and/or interpretations. Plagiarism accounted for a mere 5 % of the cases, whereas self-plagiarism/duplication accounted for 15 %. Image manipulation/duplication problems accounted for 26 % of the sample. IRB issues were identified in 11 % of the EoCs. Other less frequent concerns included publishing data without permission, failure to share data/samples or failure to register a clinical trial.

Conclusions and Recommendations

The analysis indicated wide variability in the degree of detail conveyed in EoCs and, as with notices of retractions, there does not appear to be a standard template for publishing these important communications. It is recommended that such a template be developed following guidelines similar to those proposed for retractions (see <http://retractionwatch.com/?s=idea+retraction+notice>)

CS04.4

An ethics researcher in the retraction process

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Research Integrity and Peer Review 2016, **1(Suppl 1):**CS04.4

Summary: Ethics researchers are only rarely involved in taking administrative actions following incidents of research misconduct. In this report, an ethics researcher will describe the events arising in the retraction and/or correction of multiple articles appearing in one preeminent journal, *The Leadership Quarterly*, from the perspective of both an ethics researcher and an administrative principal in the retraction process. Implications will be drawn with respect to the investigators (e.g., lack of awareness of guidelines, reliance on political behavior, stonewalling, bullying of editors), journal publishers (e.g., long timelines, over-protection of privacy rights, inadequate centralization), and responsible

editors (e.g., concerns with public image, friendships, assumptions about motives of whistleblowers). Based on these observations, some promising directions for future research are discussed. In addition, aspects of the retraction process which proved beneficial (e.g., collaboration among decision-makers) will be examined with regard to their implications for future research.

5. Funders' role in fostering research integrity

Chair: Karen Wallace, Canadian Secretariat on Responsible Conduct of Research

CS05.1

The Fonds de Recherche du Québec's institutional rules on the responsible conduct of research: introspection in the funding agency activities

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In September 2014, the "Fonds de recherche du Québec" (FRQ), which regroup the three major public funding agencies for research [1] in the Province of Québec, Canada, launched their *Policy on the responsible conduct of research* (the *Policy*). Through this *Policy*, the FRQ reaffirmed their commitment to promoting and supporting responsible conduct of research (RCR) within Québec research institutions. Echoing other RCR policies (starting with the Canadian funding agencies Secretariat), the *FRQ Policy* applies to anyone benefiting from FRQ funding: researchers, awardees, institutions and their research staff or managers. It describes best practices, a list of research misconducts (including 'FFP' but also: inadequate acknowledgement, mismanagement of conflict of interest, mismanagement of public funds, etc.) and a process by which an allegation should be managed by the institutions hosting researchers and their activities. As a condition to funding, institutions must adopt internal policies in accordance with the *FRQ Policy*.

The definition of what constitutes a 'research activity' in the *Policy* is broad: encompassing the whole life cycle of knowledge development. Although the *FRQ* does not conduct scientific research itself, some of our internal activities are part of the life-cycle of a research project, such as peer review, grant program development and funding process, dissemination, etc.

In view of ensuring consistency between what is expected from the research community and our own internal activities, the *FRQ* developed their own internal rules on RCR, mapped on the *RCR Policy*. It applies to *FRQ* employees, consultants (including scientific advisors), peer review panel members, and funding partnerships. The internal rules identify key activities of a funding agency and propose best practices based on the same values and principles described in the *FRQ RCR Policy*. They address questions such as appropriate management of conflict of interest, appropriate acknowledgement of sources, etc... Finally, they include a process to manage internal allegation of research misconducts.

This approach allows us to be consistent with the *Policy* and to promote a culture of RCR throughout Québec by leading through example. In their scientific career, researchers and awardees will most likely play different roles: sometimes as researchers, sometimes as peer reviewers, or even as advisors (or employees) to a funding agency. By using the *Policy* as a common ground for what constitute RCR (irrespective of the role played or location), we hope to send a clear signal about our expectations with respect to RCR and ensuring similar process of managing allegation throughout the province, including within a funding agency. For our employees, it has brought the employee code of ethics to a more 'applied level', providing examples of responsible conduct in the specific context of a funding agency.

References

1. Fonds de recherche du Québec Santé, Fonds de recherche du Québec – Société et culture, Fonds de recherche du Québec – Nature et technologies

CS05.2

U.S. Public Health Service funds in an international setting: research integrity and compliance

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Non-U.S. institutions receive a significant amount of U.S. Public Health Service (PHS) funds every year and play an increasingly important role in U.S.-affiliated research. Between 1991 and 2014, the National Institutes of Health—a major component of the U.S. Public Health Service that funds biomedical and behavioral research, research training, and other activities related to research on a global scale—awarded about \$11 billion to non-U.S. institutions (NIH Research Portfolio Online Reporting Tools, <http://report.nih.gov/award/index.cfm>; accessed 5/12/2015). In 2014, NIH awarded about \$1.28 billion out of \$30.1 billion (about 4.25 %) research funds for non-U.S. institutions (<http://www.nih.gov/about/almanac/appropriations/part2.htm>, and <http://report.nih.gov/award/index.cfm>; accessed 5/12/2015).

Recipients of PHS research funds, including non-U.S. institutions, are required by U.S. regulation (42 CFR Part 93) to maintain an assurance with ORI as well as submit aggregate information on research misconduct allegations, inquiries, and investigations. The ORI assurance program ensures that institutions receiving PHS funds have policies and procedures for handling allegations of research misconduct, including falsification, fabrication, and plagiarism. The volume of PHS funds appropriated for non-U.S. institutions has increased over the years, along with the number of non-U.S. institutions receiving such funds and concurrently maintaining assurances with ORI.

Between 1991 and 2014, Africa (excluding South Africa) received about forty percent of NIH funds appropriated for non-U.S. institutions, followed by Europe (21 %), South Africa (14 %) Asia and the Pacific Rim (9 %), Canada (8 %), South and Central America and the Caribbean (7 %), and the Middle East (1 %). In 2014, approximately 4,700 U.S. and 300 non-U.S. institutions received PHS research funds and maintained assurances with ORI. Overall, non-U.S. institutions receiving PHS research funds are maintaining assurances and reporting misconduct activities to ORI. The incidence of reporting alleged cases of research misconduct to ORI or the ORI receiving queries/allegations on possible research misconduct involving non-U.S. institutions from various domestic and international sources, however, does not necessarily correlate to the level of funding for non-U.S. institutions that maintain assurances with ORI. To address this critical need, ORI is enhancing its outreach activities to non-U.S. institutions to improve the handling of research misconduct allegations and help foster a global environment that promotes the responsible conduct of research.

CS05.3

Analyzing decision making of funders of public research as a case of information asymmetry

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS05.3

Research question

This paper asks what can be learned by analyzing the decision problem for funders of public research by the framework of informational economics

Background and theory

Publicly funded research aims at producing knowledge as a public good: freely available for everyone. The increasing amounts spent on research has led to an interest in increasing cost efficiency, in order to have most possible quality per spend \$. Thus, many funding agencies allocate their funding through free competition between applicants. Ideally, this should create a market for competition in quality.

However, the decision making is affected of information asymmetry. Funding agencies has less information about the actual quality than applicants. The uncertainty involved in assessing quality of research makes funding agencies vulnerable to risk of getting poor quality, and in worst case, being subject of fraud in the sense of scientific misconduct.

Information economics points at two sorts of solutions: signaling and screening. Signaling in this case involves that applicants (and their affiliation institutions) seek to make available sign of their good quality and trustworthiness. Screening in this case involves various attempts of designing the decision procedure in order to make applicants reveal relevant information. However, the theory also points out that that these solutions may be vulnerable to moral hazard, i.e. that applicants cannot be trusted to represent honestly the relevant information without incentives to do so.

Analysis

The analysis is mainly conceptual. Many academic institutions can be used in signaling: use of academic titles, peer review for publications, citation indexes and other bibliometric parameters, performance descriptions, cv's etc. Screening is involved in requiring this kind of information of applicants, but also by using external reviewing of applications, and by making funding step-wise, where each step is dependent of renewed evaluation. The main incentive to avoid the worst case of moral hazard, i.e. scientific fraud, is to have strong sanctions against scientific misconduct.

Going into more detail, however, there are many ways to undermine the attempts to break the asymmetry of information in the "grey zone": overstatement of the importance of results, use of so-called salami publication, forming of collaborative coalitions (which is often required of applicants, but which undermines the effect of competition), mutual gift-authorships, etc.

The paper seeks to give a systematical account of the information asymmetries and ways to meet them. The weight is on analyzing the various mechanisms and assessing their strengths and weaknesses.

Implications

Apart from the risk of the extreme case of scientific fraud or misconduct, the interesting question is to which extent the funding system, like the market for lemons described by Akerlof, is subject to the risk of experiencing a general decline in the average quality of research, and if so, what can be done about it.

CS05.4**Research integrity management: Empirical investigation of academia versus industry**

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Research Integrity and Peer Review 2016, 1(Suppl 1):CS05.4

Research question: There is a lack of empirical data on how managers and biomedical researchers active in both the academic and the industrial context address, evaluate, and experience research integrity and misconduct. What are their perspectives, behaviors and attitudes? What is the current research integrity management and how is it applied?

Methods: We conducted semi-structured interviews with biomedical researchers and managers active in both the academic and industrial context in Belgium. Within industry, we included large international and small companies (until data saturation was reached). Interviews were conducted in English, French and Dutch. We took an explorative,

qualitative approach because to date no thorough research has been conducted aimed at this population. Because of the explorative approach and the unique insight of this population, we opted for semi-structured interviews, where the structuring elements came from our previous research findings (Godecharle, S., Nemery, B., Dierickx, K. (2013). Guidance on research integrity: no union in Europe. *The Lancet*, 381 (9872), 1097-1098). Due to the sensitivity of the topic, interviews were preferred over focus groups. All interviews were fully transcribed. The results were processed using the software NVivo. We performed a narrative and inductive content analysis.

Results: Clear discrepancies were shown between the private and academic sector. Diverse strategies to manage research misconduct and to stimulate research integrity were observed. Different definitions of research misconduct were given. Within academia for example, different perspectives were advocated on for example what is necessary to be considered as an author.

Implications: Despite an increasing collaboration between academia and industry, and the impact of (applied) biomedical research on society, strong diversity exists both between academia and industry, and between individual researchers. The management of research integrity proves to be a difficult exercise, due to many diverse perspectives on several essential elements connected to research integrity and misconduct. A management policy that is not in line with the vision of the actual researchers is inefficient. More research is needed to map the attitudes, behaviors and perspectives of researchers and managers of our target population on research integrity and misconduct.

5A: Education: For whom, how, and what?

Chair: Farida Lada, City University of New York, US

CS05A.1**Research integrity or responsible conduct of research? What do we aim for?**

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The terms *research integrity* and *responsible conduct of research* are often used interchangeably in discussions of what it means to be a "good researcher". However, we would argue that there are crucial differences between talking about the "integrity" and the "conduct" of a researcher. Researcher A, who has integrity, might doubt how to act in a complex situation, but wishes to promote the values implicit in e.g. good authorship practice. She therefore turns to guidelines such as the Singapore Statement or the European Code of Conduct for Research Integrity, which she sees as tools to support her good intent. Researcher B, on the other hand, might live up to the responsibilities laid out in various rules and guidelines, but only in order to avoid punishment. She does not necessarily have integrity, or a deeper understanding of the values the guidelines promote.

For instance, a situation of questionable co-authorship might be subject to many different interpretations. Researcher A's and B's manner of handling such a complex situation will depend on the motives that drive them. A attempts to act in accordance with the values behind the authorship guidelines, while B might interpret the authorship guidelines to as much advantage to herself as possible.

Based on this distinction between research integrity and responsible conduct of research, we argue that RCR guidelines and courses should aim more explicitly at promoting research integrity rather than mere compliance to rules. The distinction is helpful to didactical considerations when designing courses in Responsible Conduct of Research and Research Integrity for PhD-students. Finally, the distinction can serve as a guide when setting up reward systems for research communities if it is reflected directly in the guidelines and reward criteria set up.

CS05A.2**Teaching and learning about RCR at the same time: a report on Epigeum's RCR poll questions and other assessment activities**Nicholas H. Steneck^{1,2}¹University of Michigan, Ann Arbor, MI, USA; ²Epigeum, London, UK
Research Integrity and Peer Review 2016, **1(Suppl 1):CS05A.2**

In 2012, Epigeum, an eLearning spin-out company from Imperial College London now owned by Oxford University Press, launched two versions of a research integrity/responsible conduct of research (RI/RCR) course: one for the "global" research community and the other for US students and researchers. Each version contained five tracks, with learning material appropriate to students and researchers in 1) the biomedical sciences, 2) the physical and natural sciences, 3) the social sciences, 4) engineering and technology and 5) the arts and humanities. A year later, Epigeum edited the global version of the course to create an Australian version. By the end of 2014, the course had been used by over 50 universities in 15 countries.

As a way to promote interest in learning about research integrity and to challenge learners to engage difficult issues, the course contained 15 poll questions. The poll questions give learners an opportunity to indicate how they would respond to challenging situations and also to provide feedback on the responses given by others who have taken the course. They were included in the course for two primary reasons: 1) to help learners understand that there are differences of opinion on proper behavior in research and 2) to provide discussion material for instructors using the online course in blended (web to classroom) approaches to learning.

The poll questions embedded in the Epigeum RI course also provide a tool for institutions to gather information about their learners and their research climate. As examples:

- One poll question asked learners: "If you had good reason to suspect a colleague (or even your mentor) of serious misconduct, to whom would you first report your suspicions?" Over half of those responding checked: "To the person in question," less than one third checked: "Your institutional misconduct representative."
- When asked if they would list an article on their resume that had been retracted due to plagiarized text in a section written by a co-author, roughly half said they would but would also mention that the article had been retracted. About 5 % indicated they would list and say nothing about the retraction. Learners taking the US version of the course were more likely to list the article than those taking the global version.
- When asked first whether they and then their colleagues lived up to the standards set in the *Singapore Statement*, responses followed the distribution identified by Anderson et al [1], ranking their own behavior as less than ideal but better than the behavior of their colleagues.

As illustrated by these examples, gathering feedback from learners as they are learning could help institutions refine and focus their efforts to promote integrity in research.

- Knowing that there seems to be a strong professional desire to keep responses to misconduct in-house, institutions might do more to make the presence of and services offered by their misconduct office better known.
- The tendency to list articles on resumes, even if they have been retracted, might suggest that how publications are evaluated and counted should be changed.
- Finally, both research institutions and research as a whole might be well advised to explore the consequences of a professional climate that fosters suspicion, if not distrust, of the behavior of colleagues. What impact does this have on the openness and sharing that is in principle so widely encouraged in research?

To encourage further use of assessment as a component of online learning, Epigeum is currently developing a comprehensive *Impact program* for implementation in a number of courses. A report on the implementation and results of this new program will be proposed for presentation at the 5th World Conference on Research Integrity.

References

1. Anderson, MS, et al. Normative dissonance in science: results from a national survey of U.S. Scientists. *J Empir Res Hum Res Ethics*. 2007; 2(4): 3-14.

CS05A.4**Minding the gap in research ethics education: strategies to assess and improve research competencies in community health workers/promoters**Camille Nebeker¹, Michael Kalichman¹, Elizabeth Mejia Booen¹, Blanca Azucena Pacheco¹, Rebeca Espinosa Giacinto², Sheila Castaneda²¹University of California San Diego, San Diego, CA, USA; ²San Diego State University, San Diego, CA, USA**Correspondence:** Camille Nebeker (nebeker@ucsd.edu) – University of California San Diego, San Diego, CA, USA*Research Integrity and Peer Review* 2016, **1(Suppl 1):CS05A.4****Research question**

Community Health Workers (CHWs) are increasingly involved in planning, implementing and disseminating research. While engaging community members as research facilitators is an effective model for accessing underserved communities, research integrity is threatened because few of these key personnel have received formal academic training in research methods or human research ethics. To address this problem, we are developing and testing an educational intervention called Building Research Integrity and Capacity or BRIC. BRIC is designed to increase research literacy and the responsible conduct of collaborative and community-engaged research. Our research questions are:

- What competencies do *research* CHWs/promoters need to carry out their work?
- How should these competencies be assessed in our BRIC Inventory?
- Does BRIC training improve learning about research as measured by the BRIC inventory when compared to a control condition (i.e. wellness training)?

Data and methods

The response to Research Questions 1 and 2 will be reported in the presentation. Formative research was initiated to assess the extent to which Research Support Staff (RSS) were involved in the planning, conduct or reporting of research. We defined RSS as individuals with critical research responsibilities yet, nevertheless, have received minimal, formal academic research training to prepare them to implement scientific research. Principal Investigators/Project Managers (PI/PMs) who are responsible for training Research Support Staff (RSS) were recruited (n = 36) to provide guidance on essential competencies needed to improve accountability in the conduct of research. Participants completed a survey to clarify how RSS were involved in their respective research studies, what training was provided and priorities for skills and knowledge needed to perform research-related tasks. Of the 36 participants, 19 attended one of four focus group sessions to inform development of an instrument to assess research competencies. In addition, we conducted one focus group with 9 Latino participants who self-identified as "promotores/community health workers (CHWs)" to better understand: 1- their role on research studies, 2- training received, 3- education needed to develop research competencies, 4- barriers and facilitators to professional development; and, 5- assessment preferences. This formative research informed the development and testing of the BRIC Inventory.

Results

Results of formative research revealed the PI/PMs engage RSS (e.g., CHW/promotores, Patient Navigators, Peer Educators) primarily in the implementation of research with a minority reporting involvement in the planning or reporting of research. The majority placed priority on CHW/promotores being able to think critically on the job and less importance on knowing about the ethical review process or historical facts leading to human research protections. PI/PMs tend to train RSS in the specific disease that undergirds the study (e.g., physical activity and nutrition interventions) and tasks specific to what the RSS will do as part of that project. Few believed it was important to provide a bigger picture about the study as part of training. Nearly all PI/PMs use the English-language human research protection training offered by the local university or via web-based tutorials (e.g., CITI) for training RSS. The majority expressed that training designed for academic researchers was not appropriate for RSS training. To assess research competencies, PI/PMs recommended a self-assessment followed by short problem-based scenarios depicting realistic challenges faced in the field. To reduce burden to PI/PMs who may administer the BRIC Inventory, all preferred multiple-choice responses to open ended answers.

Implications

The surveys and focus groups with PI/PMs indicated both the need for and preferred approaches to developing and assessing of research responsibilities and competencies. Given the increase in health disparities research, we are developing the BRIC Inventory for use with both English and Spanish-speaking trainees. Next steps involve pilot-testing the instrument to establish validity and reliability. In 2015, we will use the BRIC Inventory to compare different educational interventions designed to improve accountability in community-engaged research. The overarching goal of our research is to foster the integrity of scientific research by empowering these key personnel to improve their research skills and knowledge through education.

6. Country examples of research reward systems and integrity

Chair: Ana Marusic, University of Split School of Medicine, Croatia

CS06.1

Improving systems to promote responsible research in the Chinese Academy of Sciences

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS06.1

A survey was made by Chinese Academy of Sciences (CAS) at the end of 2011, for identifying major problems and weak links in research integrity, and the main factors influencing research integrity, with 4167 scientists and administrative staff responded in the survey. It was found that the primary factor influencing research integrity is the guiding role of research assessment, followed by levels of scientific culture and management, social environment, exemplary role of academic leaders, and self-discipline of researchers. Based on the analysis of the research community, the research misconduct and its causes, some actions have been taken to promote responsible research in CAS. The training and supervision for graduates and young researchers have been strengthened by various means. For example, two books commissioned by CAS, "Scientific Research Ethics Handbook" and "Research Integrity: Thought-provoking Cases of Scientific Research Misconduct" have been published respectively in 2009 and 2013. However, it is shown that the prevention and control of research misconduct are still underway in CAS, and some difficulties and challenges were encountered in the process of formulating the Regulation to Investigate and Handle Scientific Misconduct. For example, how to prescribe practical procedures for 12 branches and 104 institutes of CAS to play major roles in dealing with research misconduct associated with people at different levels and with different severity, how to develop effective methods to identify and investigate the complex and hidden research misconduct cases, and how to take different

actions, including academic penalty, organizational punishment, and disciplinary sanction etc.. Recently, CAS has initiated the restructuring of its institutions into different categories, including innovation Institute, excellence innovation center, big science research center, and characteristic institute, in order to enhance the core competitiveness of CAS. Accordingly, research assessment will be improved based on different standards for different kinds of institutes and researchers. A few examples will also be given on how to take advantage of the CAS corruption risk prevention and control mechanism to improve the supervision of research funds and to handle allegations related to their misappropriation.

CS06.3

Research rewards and integrity: systems and setbacks in Saudi Arabia

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS06.3

With the growing number of higher learning centers, cutting edge research facilities and availability of funding in Saudi Arabia, there is growing interest and participation in research. I would like to present my report and discuss the background of research and reward system in Saudi Arabia, especially university funding mechanism in Saudi Arabia, where almost all research proposals approved by the Deanship of Scientific Research are being supported by through university funding. There are concerns that reward and incentive system drive research but not the quality and integrity. I will discuss the gaps in evaluation and assessment of research proposals, interim and final reports. University also support, pay for peer review and publication costs and reward of 5000 SR for publishing in a high impact factor Journal, tenure and promotion reviews. According to national regulation the oversight mechanism is available but not implemented fully. In addition, I will briefly discuss few cases during my presentation on research integrity in relation to transparency and quality in research, decision-making /approval process, University measures to monitor the progress in responsible research.

CS06.4

Exploring the perception of research integrity amongst public health researchers in India

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Background

In Indian system, till very recently when some exclusive public health schools started opening, public health had primarily remained a department in medical colleges, where research had been a neglected aspect. In recent years, Medical Council of India has made research publications mandatory for career progress of medical teachers and for renewal of registration for medical practitioners. Since then, there is a compulsive interest in research and publication in the medical colleges and institutions. On the other hand the exclusive public health institutions are grossly dependant on research fund for their sustainability. With this "compulsive research" scenario, the issue of integrity in research assumes higher significance as compulsion is known to dilute integrity

Objectives:

- Explore the perception of the participant about the concept of integrity in research and its components
- Assess their ability to relate the practices followed by them or their colleagues to the concept of research integrity

- Suggest measures to promote research integrity in their organizations, as perceived by them

Methodology

The study involved qualitative methodology with interpretivist approach. The sample of respondents consisted wide variation in terms of parameters like experience, seniority, institution, background education. In depth interviews with the respondents were conducted with the help of a carefully drafted topic guide to facilitate a free discussion. The interviews were recorded, transcribed and coded. The coded data was analyzed with Framework analysis method.

Results

Overall, the concept of integrity was hazy and widely varying among the respondents. Many respondents mentioned that borrowing others' idea or just duplicating others' work is quite common among their fellow researchers. Majority of the respondents voiced their concern about integrity issues in data collection and mentioned that malpractices like data fudging, data duplication, using others' data, etc are not uncommon. Some respondents mentioned that occasions of breach in integrity happens in analysis phase in the form of hiding negative results or modifying to show more desired effects. Almost all the respondents mentioned about varied forms of violation of integrity in publication. Majority respondents felt that though the knowledge of integrity is present among the researchers, practice of integrity varies due to factors like basic values of the researcher, pressure to do research and publish, universalization of research and lack of fund and time.

Implications

We hope that these findings will improve awareness about research integrity not only in public health researchers but overall in health researcher community in India. It is expected to make them introspect to promote more ethical conduct in research.

7. Education and guidance on research integrity: country differences

Chair: Edson Watanabe, Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil

CS07.1

From integrity to unity: how research integrity guidance differs across universities in Europe.

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS07.1

Research integrity is imperative to good science and to the development of useful knowledge. Nevertheless, the past few years have shed light on an impressive number of research misconduct cases which suggest that the occurrence of undetected misconduct may be alarmingly high. In an attempt to frame and control the issue, many institutions and national organisations developed guidance documents that aim to promote research integrity and discourage misconduct. Nonetheless, in the hype and apparent urgency of the situation, most universities and research establishments developed distinct guidance specific to their institution, thereby risking incompatibilities with guidance of collaborating institutions. In the present project, we retrieved guidance for academic integrity and misconduct from 18 universities (members of the League of European Research Universities) spread across ten European countries and investigated their accessibility, general content, the principles they endorse, and the way they define academic misconduct. Accessibility and content differed substantially between institutions: while some offered series of extensive documents accessible in local language and English, others offered a single short document only available in local language. Although many documents explicitly listed select principles of research integrity, there was no consensus on the principles endorsed. Definitions and descriptions of misconduct also varied between institutions and documents. Parallel with previous research, we distinguished two overall approaches to guidance on research integrity: value based

and norm based approaches. Value-based approaches highlighted general moral values as principles of research integrity and tended to describe misconduct as a socially disruptive behaviour that could harm research and society. Norm-based approaches phrased principles as specific and finite sets of good and bad behaviours and tended to discourage misconduct by emphasising sanctions and personal damage. Terminology used to describe misconduct also tied in with this dichotomy. We propose that value-based approaches may help researchers understand the importance of research integrity and the extended harms of misconduct, but that a balanced approach using both values and norms may be necessary to support and promote the culture of integrity and to allow adaptation of recommendations and principles to diverse contexts of ethical dilemmas.

CS07.2

Can education and training develop research integrity? The spirit of the UNESCO 1974 recommendation and its updating

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS07.2

The General Conference of UNESCO in 2013, decided to begin a process to revise the 1974 UNESCO Recommendation on the Status of Scientific Researchers (R74).

This Recommendation deals with the integrity of researchers as a contract between them and society: researchers will benefit from a particular status of freedom and resources for their work and in exchange they are selected according to their high intellectual and moral values. The requested qualities mentioned in R74 are both an intellectual integrity (respect of the truth) and a moral integrity (awareness of the consequences of research, i.e. doing research for a better future of mankind, as described in Article 14 of the Singapore Statement). To fulfill these two criteria in order to be eligible as part of the research community, R74 mentions the necessary additional education and training of researchers to develop these qualities and make sure researchers have the level of responsibility and awareness requested by society in order to trust them. To-day, the threats against the respect of these criteria are stronger than ever even if the reasons are somewhat different, given the evolution of the research context and its constraints since 1974.

Specifically, the UNESCO General Conference resolution foresees that the revised Recommendation should "reflect the contemporary ethical and regulatory challenges relating to the governance of science and science-society relationship". As a consequence, education and tools of control about integrity have to be adapted.

We will describe how the Ethics Committee of CNRS (COMETS) has been active on both aspects of integrity: on *intellectual* integrity : it has published in 2014 a report entitled "*For a responsive integrity research*" and these "*French Guidelines*" will be a part of the discussion. On *moral* integrity, COMETS has published advices and organized summer schools for researchers dealing with their responsibility, for instance in nanotechnologies.

We will finally take the opportunity of this conference to discuss ways to teach integrity today in research.

CS07.3

The education and implementation mechanisms of research ethics in Taiwan's higher education: an experience in Chinese web-based curriculum development for responsible conduct of research

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS07.3

Without adequate knowledge and skills of responsible conduct of research (RCR), researchers and students of research institutes may involve

in misconduct during research execution. However, completion of RCR training is not yet an institutional-level requirement for most of researchers and students in Taiwan, and the lack of mandatory training resulted in serious cases of research misconduct recently. Therefore, the Ministry of Education of Taiwan begins a four-year medium-scale project in 2014, *Education and Implementation Mechanism of Research Ethics in Taiwan's Higher Education*, to fulfill the needs of RCR education and to establish a well-organized domestic RCR education system in Taiwan. An RCR education curriculum has been developed subsequently.

The curriculum is presented as a series of Chinese web-based instructional units combining texts with visuals (e.g., illustrations and comics, integrative activities, animations, and slideshows) for highly interactive content. Each unit features RCR-related knowledge, global and local standards of scientific integrity, and/or local cases regarding positive (RCR)/negative (misconduct) situations. The length is around 15 minutes per unit. The significance of the curriculum includes that (1) the project is funded by the Taiwanese government, but the development of curriculum, contents, and instructional approaches are guided merely by academia; (2) the needs analysis of the curriculum is carefully conducted before the launch of the project; (3) the curriculum meets mobile learning trends; (4) the curriculum designs are supported by learning theories and affection educational principles; (5) learning contents are informed by empirical research findings; (6) the curriculum follows cognitive theory of multimedia learning, and (7) formative and summative evaluations of each unit are conducted by educational measurement specialists based on related theories. The applications of these well-developed materials are various. They could be delivered through full-time online courses (e.g., MOOCs), blended e-learning courses (e.g., flipped classrooms), or traditional face-to-face lectures and discussions. We believed that this curriculum is a pioneer of rich-multimedia material for RCR education in Chinese-speaking areas.

Since Fall semester of 2014, students from eleven universities and colleges in Taiwan have participated in the online curriculum. All new graduate students among the participating institutes are required to complete 12 core-value units and pass a certified exam before the end of their first semester or academic year; a total of around 4,000 students have completed the above requirements by Mid-2015. We hoped that the curriculum and certificate would be broadly applied to all universities and colleges in Taiwan in the near future.

CS07.4

Educating principal investigators in Swiss research institutions: present and future perspectives

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS07.4

Principal investigators take a central role in research processes: they define goals, plan and manage research work, guide students and are key persons in publishing and in the relation to the society. Thus, they need support for the many aspects of their duties. A recent poll in Switzerland shows that less than 30 % of trainers in Swiss universities get education in research integrity. However, a high majority (94 %) of the responders desire support e.g. by a core curriculum covering relevant topics such as scientific writing, authorship, conflict of interest, data management and misconduct prevention as well as generally on research integrity issues. In the multi-language and federal political system of our country, higher education of universities and applied universities will remain divers. Based on their own memorandum, Swiss Academies take a leading role to strengthen research integrity also by teaching values and principles on all levels.

At Paul Scherrer Institute (PSI), the largest research center for natural and engineering sciences within Switzerland, courses in research integrity have been provided in the last five years by workshops addressing

the above mentioned topics. Participants were researchers from all levels and attendance was voluntary. In order to further develop these activities, a course "Research Integrity in a nutshell" will be offered for the first time this year for advanced researchers. The human resource department is in charge to provide dedicated education to all employees. Misconduct and conflicts are strongly related to mismanagement and a comprehensive education and support for all actors in sciences remain a big challenge. To become better role models, mere training will not be sufficient. In the future, dedicated educational activities for principal investigators have to be offered including practical aspects but also a deliberation of good scientific practices in the light of values and principles.

8. Measuring and rewarding research productivity

Chair: David Vaux, Walter and Elizabeth Hall Institute, Australia

CS08.1

Altimpact: how research integrity underpins research impact

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS08.1

Traditional scholarly indicators and an array of increasingly sophisticated bibliometrics, rankings and altmetrics are used to measure and assign value to the impact of research. Measurement and assignment of value has created various incentives for the production of 'impactful' research. However, the precision and usefulness of these metrics in assessing research impact and assigning value are unclear. This is because: (i) research generates and organizes knowledge, (ii) research always has impact, (iii) the impact of research occurs at across various scales and different magnitudes, (iv) the pathways research takes to make an impact can be complex and unpredictable, (v) the impact of research may be negative.

Challenges in the assessment of research impact can be seen in the interesting histories of individual pieces of research. For example, the iterative and revolutionary steps and missteps made by researchers towards the invention of HPV vaccines, Wi-Fi, and novel medical devices based on old and obscure parasitology articles such as *The proboscis mechanism of Acanthocephalus Ranae'* by Hammond (J. Exp. Biol. (1966) 45, 203–213). Furthermore, we regard research impact as positive. We should because accurate, ethical and responsible research is the norm. Most research fulfills the principles of the Singapore Statement. Research integrity therefore underpins the positive impact of research. Conversely, research that is irresponsible, erroneous or unethical has negative research impact. Although rare, negative research impact can be observed and measured, at least bibliometrically e.g. retraction, citation post-retraction. Despite this the narrative and activity around research impact assessment appears to have largely ignored concepts of research integrity and 'negative' impact.

It appears difficult to assess and assign value for research impact. Regardless, research impact metrics and rankings are powerful modifiers of the behaviors of individuals, institutions, publishers and others. Strikingly, there does not appear to be a metric for research integrity. Can there be a 'Research Integrity Score'? At article-level this might measure parameters characteristic of research integrity such as authorship contribution statements, methods clarity and openness of data. A 'Research Integrity Score' for individuals could take into account their article-level scores. An institutional 'Research Integrity Score' could include assessment of key things institutions can do to support strong cultures of research integrity. If measurement results in the assignment of value and incentives, a research integrity metric for articles, individuals, publishers and institutions can only be a good thing for research. Can research integrity be incentivized?

CS08.2**Publication incentives: just reward or misdirection of funds?**

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS08.2

The payment of publication incentives to researchers has become a wide spread global practice over the last few decades. These payments can take various forms including payments by governments to academic institutions in recognition of research outputs as publications; institutions linking faculty and department research outputs to funding and direct incentives to individual researchers. The latter may include additional research funding, promotion or career advancement and performance bonuses or direct cash payments.

In South Africa (SA), university funding by the Department of Higher Education and Training (DHET) is directly linked to each university's annual publication output of journal articles, books and chapters in books. A significant subsidy is paid to the university based on a calculation of annual publication units. Furthermore some institutions in South Africa, including my own institution, allocate part of that funding directly back to each author on an article by article basis. Each researcher has an 'account' into which this money is deposited and she can then use these funds for any broadly research related endeavour including attending conferences. However incentivising publication on an individual basis may promote behaviours that are detrimental to the promotion of responsible research conduct, such as 'double-dipping' (repackaging the same article), 'salami slicing' (fragmentation of outputs and results into multiple publications) and publishing in low impact journals.

The purpose of this paper will be to explore both the advantages and disadvantages of direct publication incentivising from the perspective of promotion of research integrity. Recommendations will be made regarding how these funds can best be distributed to both promote innovative cutting edge research and enable responsible research and publication conduct. Novel strategies at faculty and department level need to be developed so that problematic publication trends can be detected, assessed and discouraged. Institutions have an important role to play in creating awareness around issues of publication ethics and the need to consider 'the big picture' when establishing a research career, and choosing how to publish research results.

CS08.3**Why Socrates never charged a fee: factors contributing to challenges for research integrity and publication ethics**

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS08.3

This paper will focus on a conceptual and theoretical analysis of the barriers to research integrity and publication ethics which arise both from the perspective of researchers and from the perspective of editors and publishers. This analysis will consider the financial and non financial rewards for publication, particularly in rank A, high status peer-reviewed journals, as well as the influence of impact factors both on editors, publishers and researchers. The analysis will focus on the intrinsic and inherent conflict of interest in university research as well as evaluate the tensions between high standards of research integrity across many different disciplinary and interdisciplinary fields in university research, on the one hand, and increased pressure to compete with other research universities in rankings around the world, on the other. As well, many governments exacerbate these tensions with increased pressure for universities to perform research activities that will enhance global competitiveness in research and development. In addition to this, the traditional values of education which include the mandate to protect democracy and the common good rightly but awkwardly assert themselves in this complex discussion.

The presentation will also include empirical evidence from an editor and editor-in-chief who has edited a rank A interdisciplinary journal for over 30 years as well as another international, peer reviewed journal for 12 years, in addition to editorial experience with numerous other peer-reviewed journals for many years.

9. Plagiarism and falsification: Behaviour and detection

Chair: Miguel Roig, St John's University, US

CS09.1**Personality traits predict attitude towards plagiarism of self and others in biomedicine: plagiarism, yes we can?**

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Aim. To measure attitude toward plagiarism and personality traits of biomedical scientists' to determine which personality traits predict plagiarism. **Participants and methods.** The survey study was conducted during years 2012 and 2013 among 177 scientists, 131 research fellows and 46 authors of an article submitted to Croatian Medical Journal (CMJ). Scientists fulfilled three questionnaires: The Attitude Towards Plagiarism, The Dark Triad D3-27 and The Social Desirability Scale. The questionnaires were available on-line through SurveyMonkey™ web service. **Results.** The total attitude towards plagiarism was moderate (58 ± 16), approval attitude was moderate (25 ± 8), disapproval attitude was high (30 ± 4) and subjective norm for plagiarism was moderate (21 ± 5). The incidence of plagiarism has been estimated from 32 % to 46 %, self-plagiarism from 26 % to 32 %, and 2 % of respondents admitted plagiarism. Significant predictors of plagiarism were psychopathy and Machiavellianism. Psychopathy predicts disapproval attitude (8.41 %) and subjective norm (3.61 %) toward plagiarism while Machiavellianism predicts approval attitude toward plagiarism (2.56 %). Predictor variable of disapproval attitude was also the country of provenience (2.56 %). Social desirable responding was high. **Conclusions and implications.** Propensity to plagiarism was moderate to low, but given the high social desirability, the tendency can be interpreted as moderate. Psychopathy and Machiavellianism were significant predictors of the attitude towards plagiarism.

Plagiarism can be predicted in cases of a high degree of psychopathy, visible from low disapproval attitude, in case of high Machiavellianism present in approval attitude and in case of high subjective norm based on lack of moral values and less incentive environment.

CS09.2**Investigating the concept of and attitudes toward plagiarism for science teachers in Brazil: any challenges for research integrity and policy?**Christiane Coelho Santos^{1,2}, Sonia Vasconcelos²¹Colégio Pedro II, Rio de Janeiro, Brazil; ²Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil**Correspondence:** Christiane Coelho Santos (ccoelhosantos@gmail.com) – Colégio Pedro II, Rio de Janeiro, Brazil*Research Integrity and Peer Review* 2016, **1(Suppl 1)**:CS09.2

Research misconduct definitions are going global and, in many countries, such as the United States, Canada, Australia, Brazil and in the UK, fabrication, falsification and plagiarism are the major content of these definitions. However, a certain amount of consensus on research misconduct does not mean that the scope of the problem is clear cut for researchers and professionals in the sciences, including those who teach at university and schools. The concept of plagiarism, for example, is a case in point. How much consensus do we have over the limits of borrowing the intellectual creations of others and of the effect of these

borrowings on the quality of research and teaching? These questions are of particular importance for those who teach science in Brazil. Here, we present preliminary data of a project (overseen by one of UFRJ's research ethics committees) that investigates concepts of science teachers about plagiarism. We look at the possible relationship between these concepts and teachers' attitudes toward plagiarism by students. We focus on science teachers at one of the most traditional federal schools in Brazil. A sample of 143 teachers in biology, chemistry and physics were surveyed (Jul-Sep, 2014), and, so far, 56 responded. Our results indicate that 82 % of respondents demonstrate doubts about the amount of borrowing acceptable for the intellectual production of students. Also, 82 % consider that plagiarism in the sciences can result from badly designed assignments [that stimulate repetition] by teachers, and 61,4 % agreed that the way biology, chemistry and physics are taught at school stimulates more repetition than creativity. These perceptions are critical for countries such as Brazil, which have developed initiatives to stimulate creativity and innovation. We believe a better understanding of this educational scenario can trigger broader actions toward research integrity and policy focusing on the quality of research and teaching.

CS09.3

What have we learnt?: The CrossCheck Service from CrossRef

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CrossRef (<http://www.crossref.org>) is a not for profit membership association for scholarly publishers, which aims to provide collaborative services for the publishing industry. In 2008, CrossRef launched the CrossCheck service that aims to help publishers check papers for originality as part of the peer review process.

CrossCheck works by giving publishers access to the iThenticate (<http://www.ithenticate.com/>) system, and when they submitted manuscripts to the system they checked against three databases of content. It is checked against web content, the CrossCheck database, which contains the content from all of the participating CrossCheck publishers – nearly 700 – and a growing repository of online and off-line content that iThenticate is gathering and indexing, including databases from Gale and Ebsco, and sites such as PubMed and Arxiv.org.

CrossRef surveyed publishers using the service in early 2015 to get feedback on how the service is working for them, and three key points emerged:

1. CrossCheck is a useful service for CrossRef members
2. Publishers and editors are using the service in increasingly sophisticated ways
3. People want it to do more!

More publishers are using the service at the point of submission, meaning that they aren't moving papers through the review process without checking them for originality first. They are finding the service useful in detecting potential plagiarism, over 70 % of publishers surveyed said that they have found issues using the service.

Rather than penalise authors however, more publishers are using the iThenticate reports to educate them and point out issues in their citation practices so that these can be corrected. They are also educating their editors on how to spot and deal with the questions they may have. There is always talk of what percentage overlap with other papers is problematic, but publishers are using more sophisticated measures to try to discern if there are problems with a paper that need to be addressed, including taking different approaches based on the subject area the paper is covering and focusing on matches

in the body of the paper rather than in areas like the materials and methods sections where there is more likely to be legitimate overlap. Publishers would like the system to do more, including finding matches between papers written in different languages, and the iThenticate system will continue to be developed to meet users' needs as these develop.

CS09.4

High p-values as a sign of data fabrication/falsification

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Due to several (unconscious) heuristics, people are bad at appreciating randomness as it appears in nature. For instance, the gambler's fallacy refers to the tendency shown to expect too many alternation in sequences of independent random events, like coin tosses. Because data fabricators are not immune to these heuristics, the statistics they fabricate might not satisfy regularities that can be expected from random processes. Indeed, in several cases of data fabrication, fabricators consistently produced less variation than would be expected based on random sampling.

If fabricators produce highly consistent effects throughout supposedly independent samples, the p-value distribution based on comparisons of the core descriptive statistics (Ms and SDs) will be affected. If there is no fabrication and the null hypothesis is true, the p-value distribution is expected to be uniform between 0-1; if there is a non-null population effect, the p-value distribution is skewed to the right (i.e., a bulk of small p-values). However, in the case of highly consistent, fabricated data, the p-value distribution could become skewed to the left or bimodal (i.e., too many high p-values). To test for the presence of such indicators of potential data fabrication, a reversed Fisher method can be applied (i.e., $\chi^2_{2k} = -2 \sum_{i=1}^k \ln[1-p_i]$). This

statistical method can be used to test for highly or too similar condition means and condition variances.

The diagnostic value of the reversed Fisher method or other statistical methods to detect potential data fabrication has not been previously studied. Diagnostics include the degree to which these methods correctly classify studies as being fabricated or not. Application of the methods on a set of assumably genuine data indicated that 8 % of the results were misclassified as fabricated (alpha = .05). Simulations indicated that different data fabrication strategies were detected to varying degrees, ranging from approximately 25 % through 100 % for very blatant fabrication techniques. Considering that the knowledge on how data is fabricated by researchers is anecdotal, experimental studies to test the validity of these methods are planned for the next academic year.

Validated statistical methods to detect potential data fabrication enable application for studying misconduct on the basis of published research. More specifically, when combined with text-mining methods to extract statistical information from papers, these methods can be used to estimate prevalence rates of potential data fabrication. Whereas previous estimates of misconduct prevalence mostly relied on author's self-report admission, these novel prevalence estimates operate at the paper level and can estimate the percentage of potentially fabricated research papers, which is a more precise measure of how problematic data fabrication is for science. Additionally, these methods could be used alongside plagiarism scanners to red-flag potentially problematic papers.

10. Codes for research integrity and collaborations

Chair: Torkild Vinther, The Norwegian National Committees for Research Ethics, Norway

CS10.1

Research integrity in cross-border cooperation: a Nordic example

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS10.1

The aim of the proposed presentation is to show why Research Integrity (RI) is of increasing importance in international cooperation, and how the Nordic research cooperation can serve as an example on how to implement a strategy on the issue. The focus will be, firstly, on the role of research funding agencies in developing RI systems, and secondly, on how to handle RI issues in international cooperation when there are differences in national guidelines and legislations. To demonstrate how a funding agency can play a vital role in this, NordForsk will be used as an example of a regional coordinator, and the case of the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden) can serve as a test bed for best practices in cross-border collaboration.

The presentation is particularly relevant for funding agencies, policy makers and partners in international research collaboration.

The increase in research activities, the use of metrics and the pressure to obtain funding is affecting research performances in a way that calls for continuous capacity building in RI. As administrators of public funding, research funders have a central role in developing RI systems to ensure the transparency of research and research funding. Reflections on the obstacles and opportunities an agency funding cross-border research cooperation faces will be presented.

Increasingly complex global challenges require coordination of international research collaboration. RI cannot be left solely a national responsibility, but needs to be developed simultaneously at the international level. The question of how to handle allegations of misconduct is central. The presentation will focus on RI issues in Nordic research cooperation, and share best practices from our experience that may translate to other regions and to international cooperation. In the Nordic countries, there is a long tradition for research cooperation. NordForsk is facilitating Nordic cooperation through joint funding, which makes it important to enhance a common understanding of RI. Examples will be provided of how NordForsk is taking measures to ensure and promote RI in all activities.

CS10.3

Research integrity, research misconduct, and the National Science Foundation's requirement for the responsible conduct of research

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS10.3

The National Science Foundation (NSF) is a U.S. government agency that funds basic research in science, engineering, and education. Like most federal agencies, NSF has an Office of Inspector General (OIG) that provides independent oversight of NSF programs and operations. The Research Integrity and Administrative Investigations (RIAI) section of OIG is staffed by scientists and focuses on maintaining research integrity at NSF, including investigating allegations of wrongdoing involving NSF programs. While the majority of our investigations are focused on research misconduct—defined as fabrication, falsification, and plagiarism—our view is that research integrity is broader than research misconduct and also encompasses NSF's merit review, conflicts of interests, and data management, including data sharing. Maintaining the integrity of NSF's programs is important because a proposal is a request for federal funding provided by tax-payers. NSF program officers and reviewers should have accurate information representing the PI's current understanding of the current state of the field as well as the PI's ability to carry out the proposed work.

The RIAI group also performs educational activities to raise awareness of research integrity. Approximately 15 years ago, we started

recommending NSF require subjects found to have committed research misconduct take an educational course to refamiliarize themselves with their research community's ethical standards. NSF agreed and now every subject who commits research misconduct is required to take an RCR course. Additionally, in less serious cases that do not rise to the threshold of a research misconduct finding, we assess whether the act was a questionable research practice (if the act met the definition of research misconduct) or questionable administrative practice (if the act falls within the larger umbrella of research integrity). In these cases, we send the subject a letter cautioning against the questioned act and advise the subject to consult community guidelines.

Beginning in 2010, NSF required its awardees to provide RCR training for undergraduates, graduates, and post-docs supported by an NSF award. Unlike the National Institutes of Health, NSF did not provide any guidance about the content, format, or frequency of the training. We are currently conducting a survey of approximately 50 NSF awardees to learn how they have implemented NSF's requirement and we hope to report on this survey at the next meeting.

A code of conduct for international scientific cooperation: Human rights and research integrity in scientific collaborations with international academic and industry partners.

CS10.4

A code of conduct for international scientific cooperation: human rights and research integrity in scientific collaborations with international academic and industry partners

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS10.4

- As a consequence of the international interconnectedness of modern research, cooperation often takes place in very different cultural environments, each with its own set of values. In order for the completion of research to be successful, a common basis of ethical standards for cooperation is necessary. For this reason the ETH Zurich executive board has adopted a „Code of Conduct for Scientific Cooperation“.
- The central moral idea underlying this code of conduct is: ETH Zurich won't perform research at the charge of the violation of fundamental rights or disregard justified moral expectations of the Swiss society.
- The primary purpose of this code is not compliance to a regulation but to establish in the community of ETH researchers a settled conviction about intercultural collaboration aiming at successful research in ethical critical environments. So a main challenge is the internal communication of the code to put the idea across.
- One part of the articles of the code are more or less ethical standard norms (Human rights, research integrity, scientific misconduct). The other part refers to particular issues of international scientific cooperations.
- The ETH executive board has passed the code but this text should be just the starting point of a discussion of this issue across the university. During this discussion the text is open to changes to foster the commitment at least of the majority of the researchers.
- The whole issue is about balancing conflicting values, choices, or interests. The expected result of such a consideration is not wrong or right but justifiable or unjustifiable. If the researcher makes a thorough and sincere balancing considering the normative articles of the code then the code will serve his purpose. In that note the codex is binding. The researcher who is in charge of the cooperation is expected to make such a consideration.

11. Countries' efforts to establish mentoring and networks

Chair: Tony Mayer, Nanyang Technological University, Singapore

CS11.1

ENRIO (European Network of Research Integrity Offices): a network facilitating common approaches on research integrity in Europe

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Research Integrity and Peer Review 2016, 1(Suppl 1):CS11.1

The European Network of Research Integrity Offices (ENRIO) is an informal network of experts on research integrity from various European countries. Founded in 2007 by eight research integrity experts, it now comprises representatives from 23 European countries. Members assemble twice a year for a general meeting. These meetings are hosted by one of the members and often give a boost to raise awareness amongst stakeholders.

ENRIO aims to facilitate discussions and share experiences and possible solutions related to both the investigation of allegations of misconduct in research and the training and education with regard to good practices for research. It furthermore means to report discussions and develop proposals for submission to national and international organisations. ENRIO directs its interests towards liaising and working in partnership with other organisations with European or global interests in research integrity: For instance the Science Europe Working Group on Research Integrity, the American Association of Research Integrity Officers (ARIO) and others.

Membership is open to representatives of national bodies and organisations within Europe with interests in and responsibility for matters of research integrity.

Members can be representatives of

- organisations and/or bodies with responsibilities for the investigation and/or oversight of allegations of misconduct in research,
- organisations and agencies providing funding for research in countries where no organisations or bodies as mentioned under the previous article exist,
- academies and other learned societies with a special interest in promoting research integrity by promoting training and education and establish organisations for the investigation of allegations as mentioned under the first article,

Organisations which support the goals of ENRIO but want to learn more about the values and work of ENRIO are entitled to send an observer.

ENRIO grew rapidly in the last years and became a key player on research integrity matters. One particular strength of the network is the exchange of expertise and experience. ENRIO aims to support countries having no national structure on research integrity to establish such organizations. New members in ENRIO can learn from existing organizations and long-established ones might still improve their own national structures and procedures. www.enrio.eu.

CS11.2

Helping junior investigators develop in a resource-limited country: a mentoring program in Peru

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Mentoring, a component of scientific integrity, is an essential tool in the preparation of new cadres of scientists. Their guidance and expertise

result in good science, smoother learning processes and higher levels of professional conduct. This abstract describes the experience of starting a Mentoring program in a research institution in Peru, involved in infectious diseases of public health importance in Latin America. NAMRU-6, a US Department of Defense laboratory, has worked in Peru for the past 30 years and is currently home to approximately 300 staff, 95 % of the NAMRU-6 workforce is Peruvian.

The Mentoring Program was established in 2012 as a key strategic objective, aimed at improving the research skills of Peruvian researchers.

After announcing the program, a total of 28 applicants applied to be mentees on a voluntary basis. Among them, 4 PhD, 3 Master's, 15 Master degree candidates and others, 12 of them were females and 6/28 were MDs. A similar call was for more senior scientists to act as mentors. A total of 14 mentors were selected, 6 of them were females. 9 were PhDs. 6 were MDs.

After a detailed evaluation process, mentees were classified into three groups based on a pre-defined set of skills: Assistant, Associate and Independent. 24 applicants were classified as Assistant Researchers, 3 as Associate Researchers and 1 as an Independent researcher.

Roles and responsibilities were agreed upon with target goals set for the following 12 month program. Most of the mentees goals involved writing grants (16/28), finishing their Master's degree (14/28), writing manuscripts as first authors (9/28) and passing a high level English test (17/28).

Results:

Given institutional funding limitations, only 105 research training seminars were offered on site and the attendance of mentees ranged around 20 %. These were 1 hour live sessions with guest speakers, local and foreign, during working hours and offered at no cost. Travel for research purposes and other tasks may have resulted in this low attendance rate.

In the period of 2013-2014, 11 mentees submitted abstracts to international meetings (39,2 %), 5 published as first authors in peer-reviewed journals (17,8 %), this represents approximately 10 % of the institutional publication rates. Additionally, 4 mentees submitted a total of 7 new research proposals as Principal Investigators, accounting for approximately 14 % of the institutional research portfolio. In regards to their academic advancement, 2/28 obtained their Master's degree in this reporting period.

Conclusions:

Progress has been observed among the mentees enrolled in this formal mentoring program, in spite of tight working schedules and multiple other collateral obligations. Goals attained are more detectable in scientific production. Evaluating the factors for a successful mentoring program is essential

One of the main training challenges is the difficulty in reaching our off-site laboratories, where 6 of our mentees work, due to the quality of the internet signal. The lack of funding for long-term educational activities is another challenge.

CS11.3

Netherlands Research Integrity Network: the first six months

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Research Integrity and Peer Review 2016, 1(Suppl 1):CS11.3

Recently several serious violations of research integrity have come to light in the Netherlands, which placed Research Integrity (RI) high on the public and academic agenda. More systematic and explicit attention is clearly needed, especially with respect to prevention. Although many institutions – like universities, academic hospitals and funders of research – are committed to improve the research culture and to offer better Responsible Conduct of Research (RCR) education, there is little contact between the actors in the field. The newly launched Netherlands Research Integrity Network (NRIN) aims to facilitate collaboration, exchange and mutual learning, to enable consultation and intervention, to

provide information and to share research/teaching materials and best practices. The NRIN does this via the website www.nrin.nl; a newsletter; discussion meetings for diverse stakeholders; seminars on education and research on RI; training and education for different audiences; small (internship) research projects; and participation in the organisation of the 5th World Conference on Research Integrity (www.wcri2017.org). The website is designed to find relevant items via various routes, depending on the user's interests.

Participants of the NRIN events and users of the website include RI counsellors; RI committee chairs and members; RCR educators; and researchers and policymakers in the field of RI. All people interested in general or in specific RI topics can sign-up for the network and the newsletter. Activities are organized in cooperation with members of the network.

During the first six months, we have learned some lessons in starting and maintaining this network. First of all, building and maintaining a relevant website takes a lot of time. Making use of what is already there, is essential. The website, and all other communications, are in English to serve a wide target population. The website can also be used outside the Netherlands. Visitors from already 63 countries have found the website and currently 15 % of the people who signed up for network via the website come from outside the Netherlands.

Establishing and maintaining the network requires proper analyses of the needs of the target population. Also, don't do it all by yourself but get people involved. Stimulate the snowball effect. And last but not least: be enthusiastic about your work!

The NRIN is funded by the Netherlands Organisation for Health Research and Development (ZonMw). The network is chaired by Prof. Lex M Bouter and coordinated by Fenneke Blom.

CS11.4

A South African framework for research ethics and integrity for researchers, postgraduate students, research managers and administrators

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS11.4

South African universities and Research Councils have either official research ethics and integrity codes or ethical frameworks and guidelines informing research. There is, however, no overarching national framework, statement or guideline for research ethics and integrity covering the scientific research encyclopedia (scientific disciplines). International examples of such documents are the Australian National Statement on Ethical Conduct in Human Research (2007), the European Science Foundation's European Code of Conduct for Research Integrity (2010), Singapore Statement on Research Integrity (2010), Montreal Statement on Research Integrity (2013) and the Expert Panel on Research Integrity in Canada (2010). Although such examples may exist, these statements and frameworks cannot simply be carbon copied into another system.

During the third World Conference on Research Integrity (Montreal, May 2013) I presented a draft framework for research integrity in South Africa ("Setting an agenda for research ethics in South Africa"). This presentation reflected on national policies and development in support of research, innovation and socio-economic development. Following on the Montreal presentation, my framework was further developed. In this presentation a framework for South African Research Ethics and Integrity will be presented. The framework for research ethics and integrity is aiming at guiding researchers, post-graduate students, research managers and administrations to conduct research respectful, with integrity, to develop a research culture reflective of nation building and its value system and to be aligned with international best practices and requirements.

The framework engages with the research value chain and what kind of ethics and integrity guidelines is required for doing research. The research value chain refers to the interconnection of research processes and activities to solve the research problem and question (from problem to solution), to identify a new understanding of the research problem and question based on literature, evidence and results (innovation) and to contribute towards the knowledge economy

and socio-economic development (through transfer, incubation and commercialization).

The framework will reflect on three major issues:

Firstly, research is international, inter-disciplinary, team oriented, technology-intensive, and should be non-manipulative and free from error or distortion. The many characteristics of research contribute towards the question whether a research code for a country / system is unique in itself. Hence the question will be addressed why a context specific research ethics and integrity system is required and what the contents of such system could be.

Secondly, the concern will be addressed that although an enabling ethical climate can be created, it is no guarantee that researchers will be "ethical" or behave according to ethical expectations. Hence the concern remains if one can teach or train researchers to be ethical? The question therefore is how can 'n research community become more responsive to those norms and values associated with a responsible research community? This concern becomes even more challenging when the question is raised if belief systems, personal orientation and institutional support influence the ethical behavior of researchers, post-graduate students, research managers and administrators. This presentation will indicate how a coaching model and culture of value and compliance can assist researchers, post-graduate students, research managers and administrations to be ethical in their research.

Thirdly, will the Frascati Manual for Research be analysed and the ethical indicators for basic, applied, developmental and contract research will be formulated. These indicators will support the idea that research activities are interrelated and hence could be presented as an ecological system. The meaning thereof refers to the *concept of ecology* which is derived from the Greek *oikos*. *Oikos* is a combination of *house* and *logia* meaning the study of interactions amongst organisms and their environment. The purpose of this approach is to avoid the practice where researchers, post-graduate students, research managers and administrators lose sight of the interrelatedness of research activities and their value systems.

The framework that will be presented in the following four categories:

Academic: Academic citizenship, research as a common good, relevance, markets and social impact, role models, partnership and the next generation of researchers.

Science: New knowledge, scholarship, quality and standards, funding.

Values: Do no harm, protect vulnerability, add value and meaning.

Application: Authorship, postgraduate supervision, data and IP protection.

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12. Training and education in research integrity at an early career stage

Chair: Harold (Skip) Garner, Virginia Polytechnic Institute, US

CS12.1

Research integrity in curricula for medical students

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International Federation of Medical Students' Associations, São Paulo, Brazil

Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS12.1

The lack of training related to Research Methodologies and Research Integrity led the IFMSA (International Federation of Medical Students' Associations) to organize the first Pre General Assembly workshop in March 2014 in Tunisia, followed by the pre General Assembly workshop

on Research Integrity during the August Meeting 2014 in Taiwan. Our vision is to equip medical students with the knowledge and skills to take on health leadership roles locally and globally - and begin taking action through capacity building for all our members. To follow up, we are conducting a survey to study the status of medical education worldwide focusing on the implementation of research related programmes, where we will try to identify how many medical schools have research integrity education in their curricula and/or offer extra-curricular programmes and to evaluate them.

Methodology: A survey that will analyze and study the status of medical education worldwide, according to the students' perspective is being designed by IFMSA. One of the focuses of this survey is the existence and impact of education on research. Information is sought focusing on the year of medical school, number of medical schools in responder's country of studying, existence of the training as compulsory or co-supplement to medical curricula, if the research is supported financially and logistically by the medical schools and healthcare institutions, the quality and satisfaction with such training.

Data collection: The data will be collected from medical students in all years, from the IFMSA networks. Such non-statistical framework for size determination is accepted because we are interested in a descriptive and qualitative analysis. This data will be used to advocate within universities to improve already existing education or add missing elements to the current medical curricula.

CS12.2

Team-based learning for training in the responsible conduct of research supports ethical decision-making

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Research question or thesis

Typical responsible conduct of research (RCR) training methods do not support and may harm ethical decision-making (EDM). We hypothesize that team-based learning (TBL™) will provide the necessary student engagement to have a more positive impact on EDM than traditional lecture, online, and/or small group RCR teaching methods.

Data and methods

TBL uses individual work, group work, and immediate feedback to motivate students to hold each other accountable for coming to class prepared, actively engaging in discussion, and focusing on application of course concepts. There is growing evidence for improved learning outcomes in a variety of educational settings and disciplines using TBL. Positive preliminary results using a TBL RCR curriculum developed at UF are now available from four cohorts of students at two institutions (see below). We are conducting a two-year project funded by the Office of Research Integrity designed to revise the TBL RCR curriculum and improve upon these positive learning outcomes. Research scenarios been revised to include content characteristics that support good EDM, including social context, goals of the characters, modeling mastery behavior, and providing forecasting prompts. We have also incorporated the "So Far No Objections" (SFNO) moral method, providing both a clear framework within which to think about ethical dilemmas related to research and concrete steps to guide learners in resolving ethical dilemmas. During the 2014-15 academic year this revised TBL RCR curriculum is being implemented and assessed in nine RCR courses at seven different universities, and additional data will be presented.

Results / findings

Preliminary results from four cohorts of learners at two institutions, using the TBL RCR curriculum originally developed at the University of Florida, reveal gains in overall ethicality and in three of four dimensions of EDM, including data management, professional practices, and business practices, when compared to the findings for more common RCR training methods reported by Antes *et al.* (*Academic Medicine* 85:519-26, 2010). Pre/post-test gains were also observed in five of seven meta-cognitive reasoning strategies, suggesting that TBL instruction supports students' abilities to recognize circumstances, question judgment, manage emotions, anticipate consequences, and analyze personal motivations. The impact of the TBL curriculum on social-behavioral responses was inconsistent across learner groups, but generally showed improvement over the mostly negative impact of other curricula. Learning outcomes using the revised TBL RCR curriculum will continue to be assessed via pre/post-testing of EDM. In addition, student perceptions about the TBL RCR curriculum and its impact on EDM will also be assessed using a mixed methods quantitative and qualitative approach, using surveys about team performance, professional moral courage, and self-efficacy, as well as student interviews.

Implications

The TBL teaching format emphasizes shared problem-solving and decision-making, which may limit the development of self-protective behavior, get learners accustomed to making ethical decisions in a team setting, and establish a pattern of future research behavior. TBL provides continual feedback not just about student performance in terms of knowledge acquisition, but also about strategies and processes involved in ethical decision-making. Improved learner engagement and satisfaction with RCR training may help students overcome the notion that RCR training is simply a requirement that must be endured, and help support the development of a culture of ethics and research integrity.

CS12.4

Research integrity and career prospects of junior researchers

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS12.4

Development of human resources in research represents one of the most important priorities in national and transnational research policies. While it is widely recognized that integrity in research systems has positive effects on the career prospects of researchers, there is still a limited understanding of the factors and mechanisms which influence this relationship. Career development of junior researchers has been mainly discussed in the context of the training practices and supervision. However, the relationship between integrity and career development is more complex and it depends on many other segments of the science enterprise, which are not necessarily related to the responsible conduct in the research process itself.

This contribution analyzes the influence of the integrity on the career prospects and development of junior researchers. It considers a range of activities and entities involved in or related to the research system, identifies challenges and maps opportunities which can boost careers of young scientists. Aside from the training and mentoring, more light was shed on the influence of institutional culture, funding systems, reward and promotion systems, and subjects related to the publishing.

Particular attention was paid to the policy analysis, with aim to highlight the relevance of policies and regulations which do promote integrity in various aspects of the research careers, but which have not acquired suitable recognition and visibility in the research integrity context. The main focus was on the European Commission's policy document *The European Charter for Researchers & The Code for the Recruitment of Researchers*. This document defines the roles and responsibilities of researchers and provides set of general principles about roles and responsibilities of researchers, their institutions and funders. Although the Charter has been mainly considered in the career context, the presented analysis of its general principles revealed also a tight connection with research integrity principles.

Finally, the recommendations are provided to encourage development of research system in the direction which promotes development of human resources on the basis of principles of responsibility and integrity. One of the recommendations is specifically related to The European Charter and Code for Researchers. Recognizing both its important place within the existing European research policy framework and its neglected significance for fostering responsible research and institutional culture, it was suggested to give a higher political relevance to this hidden value of the document and actively use it to raise awareness of research integrity among European researchers, employers and funding institutions.

13. Systems and research environments in institutions

Chair: Daniel Barr, University of Melbourne, Australia

CS13.1

Implementing systems in research institutions to improve quality and reduce risk

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS13.1

This paper discusses the drivers for implementing Quality Systems in life sciences laboratories where there is no specific legislation to require one. Risk and consequence are explored as key influences, and critical components for successful implementation are highlighted.

Introduction

Without specific legislation to drive the requirement for quality systems in the Research and Development laboratory the drivers must be voluntary. In the regulated arena the requirements are fairly clear and the penalties for not complying can be severe on many levels. In research institutes, where these laws are not applicable, implementation of quality systems must be driven by a desire to produce robust, reliable data which will withstand increased scrutiny and patent challenges. Over the last decade there has been a move towards implementing such systems, with published guidelines helping to define the desired elements.

Risks

Common key risks (and therefore drivers) in life sciences research include:

- patent and IP vulnerability, which can be mitigated by thorough documentation and verification processes at the recording stage, and by robust data storage systems for both electronic and hardcopy data
- research assay failures, which may be influenced by inadequately characterised methods, inconstant application of those methods, poor instrument qualification or variable reagents and materials
- funding and collaboration requirements, with increasing emphasis being seen on reliable partners, return on investment and due diligence activities
- increased regulatory scrutiny, with high likelihood of research data being referenced in patent applications and registration submissions many years after it was recorded.

Consequences

The consequences of those risks include losing patent or IP challenges, damaging academic reputation and credibility, being late or unable to deliver data as promised internally or to collaborators, losing out to competitors for funding, poor decision-making for further research, and inability to market ideas or products.

Factors for success

A step wise approach to implementing a quality system is required, based on careful consideration of the greatest risks and where the most benefit can be achieved. Risk assessment and gap analysis is crucial to avoid wasting effort on low-risk aspects.

Senior management must be committed to changing the culture of an organisation. This requires a constant, long term approach and

understanding of the resource required for implementation, but will be easier if the risks are clear and the system is simple and pragmatic, rather than bureaucratic.

Use of local or functional champions can significantly aid successful implementation, and using feedback of what works or doesn't helps make the system proportionate and appropriate for each organisation.

Regular progress review allows senior management to be reassured about risk mitigation and helps the scientists to see what has been achieved and how confidence in the data increases.

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CS13.2

Creating an institutional environment that supports research integrity

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS13.2

This presentation attempted to explore various questions: What does it say about the state of research integrity at Institutions world-wide, when the need to enhance research data reproducibility has become a major focal point in the media? The first response always seems to be more "mandated" training. Are we saying that any training researchers have received thus far has been less than stellar? The debate about the effectiveness of Responsible Conduct of Research (RCR) training has been ongoing since the early 90s. So what can institutions do to create change in behaviors and moral awareness? What type of institutional environment would best support research integrity? How can everyone at a research institution contribute to research results we can all rely on? Are ethics and compliance conflicting concepts? Do these concepts change based on country of origin? What impact does that have on collaborative science?

Examining various Research Integrity policy documents from the global community and using Memorial Sloan Kettering Cancer Center in NYC as a baseline, this presentation attempted to answer some of these concerns. The role of the research administrator in particular was explored to understand the importance of the role he/she plays in supporting and maintaining an institutional culture that nurtures scientists and staff to a high level of moral awareness and ethical decision-making.

CS13.3

Ethics and Integrity Development Grants: a mechanism to foster cultures of ethics and integrity

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS13.3

The University of Melbourne has developed a comprehensive strategy to address the challenges of responsible and ethical research. We consider that there are three traits common to institutions with good cultures of research ethics and integrity; (i) voices from the top, (ii) clear expectations and (iii) education and training and our strategy outlines a range of activities that cover these areas.

As part of this strategy, the Office for Research Ethics and Integrity called for applications from researchers and others in the University community to fund small projects related to ethics and integrity. The guidelines were deliberately broad and allowed for money to be allocated for conference attendance, development of educational material and pilot research projects. Our hypothesis was that a relatively

small amount of money could be used to help demonstrate that the application of the principles of research ethics and integrity is a 'living thing' that needs to change as research practice does. Supporting this was the idea that spending money on something demonstrates its importance.

Twenty applications were received in the first round of funding for the Ethics and Integrity Development Grants from across the breadth of the University. Six projects were funded and covered areas as diverse as the ethics of bionic eyes, simulations of sick animals for veterinary students that reduced our use of animals, considered the ethics of intervening in the social lives of vulnerable older people and establishing an indigenous ethics advisory group. Nineteen applications were received in the second round and another six projects were funded. One project looks at replication of results in the social sciences, two focus on improving animal welfare, one that looks at research in the creative arts and explores what research means in these disciplines using innovative models and the final two focus on specific areas in human research ethics.

Each year since its inception, OREI has held a "Beyond Compliance" event to celebrate the winners, hear updates on progress and launch the funding call for the next series of projects. This event presents an almost unique opportunity to showcase positive developments in ethics and integrity. It helps the University demonstrate its acceptance of its responsibilities to research participants, and demonstrates that the principles of ethics and integrity *are* living principles that require renegotiation and discussion.

Institutional support for this activity was relatively easy to garner – the benefits were clear and the amount of money required is relatively small. Overall, our experience has been nothing but positive, and the demonstration by provision of money that research ethics and integrity matters to the University will prove to be useful in founding the culture of ethics and integrity at the University.

CS13.4

A culture of integrity at KU Leuven

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS13.4

Research integrity as part of the institutional research policy

Research integrity is an inherent part of KU Leuven institutional research policy as it is one of the six spearheads in the research policy plan. There is a growing understanding that research integrity is a keystone of good governance. Maesschalck and Bertok (2009) [1] state in their publication that integrity management should take into account four main functions: determining and defining integrity, guiding towards integrity, monitoring integrity and enforcing integrity.

These four functions of integrity management are brought to life within the KU Leuven, but at KU Leuven, prevention of misconduct is, via the second pillar of integrity management, more important than remedies and sanctions. The KU Leuven policy aims at fostering a culture of integrity in order to meet the highest standards in correct scientific behaviour. High quality science and research integrity go hand in hand.

New course on scientific integrity for all doctoral researchers

Starting from the academic year 2014-2015 there is a course on scientific integrity at the institutional (KU Leuven) level, mandatory for all newly registered PhD students. This course covers topics ranging from conduct and misconduct in science, responsible authorship, good data management, how to deal with integrity issues, etc. The didactical team of the lecture consists of 5 professors covering expertises ranging from juridical, ethical to clinical expertise. They are excellent scientists who in addition to their own research, also want to contribute towards stimulating a culture of integrity. Two of the teachers are also member of the KU Leuven Commission on scientific integrity, responsible for the assessment of specific complaints relating to scientific integrity.

In addition, a discipline-specific follow-up of this introductory course will be organised at the level of the Doctoral Schools.

There is also an interactive online tool which was developed by professional experts of Epigeum LIRIcs (Leuven Institutional Research Integrity – culture and self-reflection). LIRIcs is accessible through Blackboard and can be consulted at any time. During the lecture, the didactical team is referring to LIRIcs for specific exercises in order to stimulate a blended learning approach. Doctoral researchers are strongly encouraged to consult LIRIcs and to discuss it with their supervisors. Overall, it is important that good research practices is also taught in the context of everyday practice of science.

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14. Peer review and its role in research integrity

Chair: Charlotte Haug, Norwegian Medical Association, Norway

CS14.1

Peer review research across disciplines: transdomain action in the European Cooperation in Science and Technology (COST) "New Frontiers of Peer Review (PEERE)"

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS14.1

Peer review is at the heart of scientific research, both in communicating research results and allocating research resources. It is also considered to be an important factor in preserving the integrity of research and its public record. However, peer review has been criticised for its failures to promote innovation and detect misconduct and two Cochrane systematic reviews showed that there is little evidence for the effectiveness of peer review in publishing and funding decisions. The new COST Trans-domain Action PEERE will investigate peer review through trans-disciplinary, cross-sectorial collaboration with the aim to improve efficiency, transparency and accountability of peer review. The Action currently includes researchers from 26 countries and from diverse disciplines such as computational sociology, economics, basic sciences, and scientometrics. During the next four years, the Action will analyse peer review by integrating qualitative and quantitative research and incorporating advanced computational and experimental investigation; test the implications of different peer review models and different scientific publishing systems for the rigour and quality of peer review; discuss present reward structures, rules and measures and explore new solutions to improve collaboration in all stages of the peer review process; and develop a coherent peer review framework for stakeholders that represents the complexity of research in various fields. We will present the first results of our research at the 2015 World Conference on Research Integrity.

CS14.2

Using blinding to reduce bias in peer review

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The first question Glenn Begley raised in his commentary "Six red flags for suspect work" (*Nature* 497:433-4) was "Were experiments performed blinded?" He said "many of these flaws [that cause irreproducible results] were identified and expunged from clinical studies decades ago. In such studies it is now the gold standard to blind investigators..." Although the first double-blind clinical trial was published as recently as 1943, they are now mandatory before new drugs can be approved for clinical use. The reason clinicians and subjects are blinded in clinical trials is because blinding reduces bias. Similarly, pre-clinical researchers are less likely to skew their judgments if they don't know whether they are looking at the control or experimental data. Scientists not only need to use their

judgment when conducting trials or interpreting experimental data, they also need it during peer review of publications. Just as double-blinding of clinical trials reduces bias, double-blind peer review would reduce publication bias, because it would force reviewers and editors to judge papers on their scientific content, rather than on who the authors were, or where they came from. Biased peer review may be a major reason why so many papers are published that turn out not to be reproducible. I will present some evidence for bias in peer review related to nationality, and suggest some ways in which double-blind peer review could be implemented.

CS14.3

How to intensify the role of reviewers to promote research integrity

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It is very well recognized that high quality reviewers play an important role in improving manuscript quality and they are sharing responsibility in protecting the integrity of the scientific literature. Reviewers can help in monitoring most of the ethics issues in publishing research such as plagiarism, falsification (manipulation of existing data/figures), fabrication (making up data), duplicate publication, conflict of interest and improper use of humans or animals in research. This abstract elaborates on some ideas thought to help in improving the reviewers' reports and the review process in general, which is important in promotion of research integrity. Some of the discussed ideas are practiced at present by some journals, but not widely adapted.

1. Reviewers training to improve their efficiency in reviewing scientific literature.
 - Reviewers' workshops (i.e. How to Review a manuscript, Reviewer Responsibilities, etc.). Online/virtual format can be considered to reach all reviewers.
 - Providing specific reviewer Instructions and/or Guiding Program.
 - Giving the reviewers opportunity to browse through examples of quality reports
2. Empower reviewers with some tools to improve their reports, such as:
 - Access to the related literature databases.
 - Access to plagiarism detection tools.
3. Typically, reviewers are not paid for their services, even though they exert considerable effort in manuscript review. Therefore, it is essential to offer the high quality reviewers some kind of incentives or recognition to encourage them to continue accepting review. Such incentives may include:
 - Offering high-quality reviewer certificates.
 - Publishing special list of top reviewers in the journal.
 - High-quality reviewing activities indicate that the reviewer is committed to the scientific community. Therefore, this should be considered in promotion process or annual report.
 - Provide complementary subscription to the journal.
 - Financial incentive related to the quality of review.
4. Journal consortia to share information about reviewer of the same field. This will allow:
 - Exchange of feedback about reviewers' efficiency (fast/slow, light/deep, etc.)
 - Review times per a specific reviewer, which will reflect cumulative experience..
 - Sharing reviewers' reports (good or bad).
 - Sharing list of excluded/low performing reviewers.
5. Adapting transparent policy of review process
 - Publishing review reports online.

- Providing each reviewer with the other reviewer(s) report(s) and judgment prior to the final decision.
- Provide reviewers feedback on final decision made by the journal.
- Revealing the identity of reviewers during review process or after final decision.

The authors think that the review process is worth a second look to enhance its role in promotion of responsible research, and the above-mentioned steps are thought to help in this direction.

CS14.4

Credit where credit's due: professionalizing and rewarding the role of peer reviewer

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90 % of researchers feel that peer review improves the quality of their published paper; authors regularly cite speed and quality of peer review as a key factor in submission decisions; and 90 % of authors are also peer reviewers (see, Ware, M (2008). Peer review: benefits, perceptions and alternatives. PRC Summary Papers 4. Publishing Research Consortium). At its best, peer review upholds responsible research practice. Yet, despite the importance of and commitment to peer review as a system for assessing the plausibility of research claims, no formal training process for peer reviewers exists.

Recent media stories (such as those in the Economist, October 2013 and The Guardian, July 2014) have drawn attention to perceived flaws in the peer review system, and, while the principles of peer review are valued within the research community, there is also acknowledgement that aspects of the process need improvement. Peer reviewers learn on the job, but experience of peer review does not necessarily indicate reviewer skill. It is hard for editors to predict who will be a good reviewer, and hard for reviewers to know what is expected of them.

This presentation will discuss how publishers, editors and research institutions can best collaborate to develop reviewer training programmes, establish performance indicators, and formally recognize and reward the role of reviewer in order to improve reviewer performance, enable journals to monitor the quality of their reviewers, and ultimately enhance the quality and integrity of the science they publish.

15. Research ethics and oversight for research integrity: Does it work?

Chair: Iveta Simera, University of Oxford, UK

CS15.1

The psychology of decision-making in research ethics governance structures: a theory of bounded rationality

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Research questions/thesis

Research ethics governance is a major system aimed at promoting research integrity and responsible conduct of research (RI/RCR), and research ethics committees (RECs) are a prominent feature of this system. We present a psychological investigation of REC decision-making that develops bounded rationality - a term which refers to the psychological idea that decisions tend to vary systematically depending on both cognitive and situational factors - as a theoretical orientation for future research.

Data and methods

This research used a qualitative comparative case study design, which involved an in-depth analysis of data collected from three RECs operating in different settings (medical, academic and specialist). Data collected included a) REC documents (mission statements, terms of reference, operational procedures, etc.), b) structured field notes from observations of actual REC meetings (two per REC), and c) semi-structured follow-up interviews with any individually consenting committee members. Portions of this data collection were based on the findings of a preliminary study, which provided initial support for the applicability of bounded rationality. There was also an open-ended component to data collection which was intended to allow for the organic expression of unexpected aspects of decision-making which might support alternative theoretical orientations.

Preliminary results

Thus far, initial impressions have provided convincing support for the application of bounded rationality as a theoretical orientation for understanding RECs' decision-making. In terms of decision-making context, there seems to be several linkages between societal values and intuitive components of decision-making. For example, the medical committee valued the input of laypersons, not due to their unbiased perspectives as a non-expert, but because they are seen as arbiters of society's intuitions and emotions regarding ethical decision-making. With regard to cognitive factors, preliminary data suggest that the existence of heuristics that are centered on notions of sensitivity (in terms of research topic areas) and vulnerability (in terms of research participants). The combination here of cognitive and ecological variables in the ethical decision-making forum might point toward the utility of theories of moral psychology to strengthen bounded rationality as an applicable framework.

Implications.

This project takes the first step toward the benefits of a more cohesive body of literature in the area of research ethics review, which will ultimately benefit our cumulative knowledge about research ethics governance. It is hoped that understanding the psychology of REC decisions will lend prescriptive insight into RECs as well as researchers in applied settings, with the ultimate goal of positively impacting the integrity of our body of scientific research on the whole.

CS15.2

Investigator irregularities: iniquity, ignorance or incompetence?

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS15.2

All clinical research involving human subjects in the United Kingdom requires an ethical review provided by an NHS Research Ethics Committee. The National Research Ethics Service (NRES), which is under the auspices of the Health Research Authority (HRA), has been collecting information pertaining to breaches of research protocols and the principles of good clinical practice for a number of years; for the purpose of ensuring that appropriate remedial action is taken and to ensure that there is a comprehensive record.

In April 2013, the detail of the breach which occurred and the demographic information being recorded was expanded and the recording mechanism was improved so that data being collected could be analysed. The purpose of this was to identify commonly occurring themes and trends and identify areas of concern to undertake service improvements projects and direct future healthcare research policy development. In the majority of cases the breach was an isolated incident but patterns of poor practice were also identified and addressed with individual organisations. Some evidence of fraudulent practice was also identified.

The information which was collected in the 12 months from April 2013 to March 2014 has been analysed and key areas have been identified for further improvement and development work. These include consent processes, non-adherence to recruitment criteria, a

lack of effective document management systems, poor record management, issues with safety reporting and ineffective processes for the management of investigative medicinal products.

The information pertaining to breachers will continue to be collected and will be analysed on an annual basis so that any improvements resulting from the work being undertaken can be measured and an overview of current research governance issues can be maintained.

CS15.3

Academic plagiarism

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS15.3

The scholarly literature in the Portuguese language on plagiarism is not extensive and is even sparser when the focus involves questions of just why plagiarism is considered contemptible within the scientific community. The objective of the research reported in this paper was to examine a wide variety of sources published in the principal international centers of scientific and humanistic research in order to register and organize the ideas and arguments found in differing ethnic cultures and varying academic disciplines. The major topics covered are: the nature of knowledge of interest to science; the role and functioning of communication in the academy; the work and career of an academic researcher; the system of "rewards" with which the researcher must co-exist; the principles and norms of social ethical behavior in general, and specific professional ones to be found in the world of science; the significance of "originality" and the concept of "priority" which govern the values held by scholars; the presence of moral relativism in society and its influence on practices in the publication of research results; the unacceptable excuses offered by offenders of the norms concerning plagiarism; the ambivalences [cognitive dissonance] which circulate in academic circles regarding plagiarism; the importance and obligations of educating new generations of students, many of whom do not seek careers as scientists or scholars, that the criteria used in evaluating their work in an academic environment closely reflect the values which guide practices in the global community of scholarly investigation.

16. Research integrity in Europe

Chair: Nicole Foeger, Austrian Agency for Research Integrity, Austria

CS16.1

Whose responsibility is it anyway?: A comparative analysis of core concepts and practice at European research-intensive universities to identify and develop good practices in research integrity

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS16.1

The purpose of this presentation is to contribute to the international debate on how to promote research integrity (RI). We will present an analysis of good practice in research integrity at the institutional, university level, comparing codes of conduct and other protocols of the leading research-intensive universities associated in the League of European Research Universities (www.leru.org). The presentation will include a comparative analysis of the information provided by the 21 LERU universities (located in ten European countries), looking at the role of ethics committees as critical bodies at the institutional level, not only for reviewing research protocols but also to train and foster a culture of respect on RI. It will also point to the need of communicating a clear policy on integrity, including not only principles and guidelines but also bodies involved, and the need to connect with society.

First, we examine to what extent the codes/guidelines rely on ethical principles and whether they include practical guidance or case analysis. This also includes the purpose and definition of core concepts.

Second, we analyse to what extent the codes/guidelines distinguish whose responsibility research ethics/integrity is. Finally, we investigate the question of accessibility, i.e. how easily information on RI is available on university websites and how they communicate to the research community and society.

The goal is to provide the state of the art on RI codes and guidelines at European universities in order to identify good practice, common goals, main differences, added values and loopholes between the RI policies of LERU universities and to share them at a global level.

CS16.2

Research integrity guidance in European research universities

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Research Integrity and Peer Review 2016, 1(Suppl 1):CS16.2

Research integrity is imperative to good science. Nonetheless, many countries and institutions develop their own integrity guidance, thereby risking incompatibilities with guidance of collaborating institutions. We retrieved guidance for academic integrity and misconduct of 18 universities from ten European countries and investigated their accessibility, general content, the principles they endorse, and the way they define academic misconduct. Accessibility and content differed substantially between institutions. There was no consensus on the principles endorsed nor on what constitutes misconduct. Parallel with previous research, we distinguished two overall approaches to guidance on research integrity: a value based and a norm based approach. While value-based approaches highlighted universal principles of research integrity and tended to describe misconduct as a societally disruptive behaviour, norm-based approaches focused on specific and finite sets of good and bad behaviours and tended to discourage misconduct by emphasising punishment and personal damage. We propose that a balanced approach using both values and norms may be necessary to promote the culture of integrity and to allow adaptation to diverse contexts of ethical dilemmas.

CS16.3

Research Integrity: processes and initiatives in Science Europe member organisations

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In 2013, Science Europe established a Working Group on Research Integrity (WGRI). Its remit is defined in the Science Europe Roadmap, published in December 2013.

The WGRI set up four Task Groups:

- Mapping
- Training and Awareness-raising
- Knowledge Growth
- Strengthening Collaboration

The WG's first task was to undertake a comprehensive survey of its Member Organisations (MOs), in May 2014. The MOs are 'research funders', 'research performers', or both. The ultimate aim was to provide data and recommendations to the SE members. The survey included 34 main questions. Overall, 33 (out of the then 52) MOs responded (63 % response rate). This is a summary of the findings:

- Across the MOs, there was no single definition of RI
- Research might fulfil requirements for 'integrity' but be ethically dubious; the two were

separate but related. This affected how MOs approached them

- The context was broad; 'interested' groups included: research community, patients, users, society....
- Even without clear definition of RI, most MOs had instruments and policies in place (eg. Code of Conduct), and mechanisms for raising awareness
- About half of respondents reported an explicit commitment to RI by MO staff (researchers); but there were also implicit commitments by some MOs
- About half of respondents had legally binding instruments (laws, contracts, etc)
- 22 ROs had in their country/region a body for dealing with violations of RI; 17 MOs themselves had procedures in place for dealing with allegations
- Only a minority of MOs had procedures for dealing with an allegation after a person had moved institution; or if an investigation was ongoing at the time of a move; or when the investigation had been completed before a move
- Only 1 MO had a policy on checking research misconduct with previous employers
- Only a minority of MOs had a whistle-blowing arrangement
- There was a variety of type of sanctions that could be applied
- There were no reliable data available on trends in allegations or cases of misconduct
- Few MOs routinely included RI requirements in collaborative agreements
- On self-assessment of mechanisms to promote RI, some MOs had made a good start already; others had yet to start.

More detailed work is being done by the other three Task Groups. The WGRI will report to SE General Assembly by the end of 2015. A full report is expected to be published after that.

Some relevant links:

- SE Roadmap: www.scienceeurope.org/policy/policy-2/roadmap
- SE WGRI: www.scienceeurope.org/policy/working-groups/Research-Integrity

CS16.4

Promoting research integrity in Italy: the experience of the Research Ethics and Bioethics Advisory Committee of the Consiglio Nazionale delle Ricerche (CNR)

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Founded in 2009, the CNR Research Ethics and Bioethics Advisory Committee is the central ethical board of CNR (Consiglio Nazionale delle Ricerche), Italy's main national research institution. The Committee has paid an increasing attention to matters of research integrity. It has promoted various national and international activities aimed at informing and educating young researchers, and since 2013 it has taken on the formal role of consultancy to CNR's President on specific cases involving allegations of misconduct.

As part of this new mission, the Committee has developed CNR's first Guidelines on Research Integrity, a document that, whilst learning from international experiences, takes an original approach in its structure and content, and aims to sustain the leading role that CNR and the Committee play within the Italian research community.

In this talk we will illustrate the activities of CNR on the topic, present the new guidelines, and discuss the main challenges in promoting research integrity in Italy.

17. Training programs for research integrity at different levels of experience and seniority

Chair: Susan O'Brien, The University of Queensland, Australia

CS17.1

Meaningful ways to incorporate research integrity and the responsible conduct of research into undergraduate, graduate, postdoctoral and faculty training programs

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Brief overview: This presentation will be a comprehensive discussion of meaningful ways to incorporate research integrity – and the responsible conduct of research – into undergraduate, graduate, postdoctoral, and faculty training and education programs. This presentation will also be of special value to international researchers, professors, and indeed anyone involved in international research collaborations.

Two research question(s):

1. What are the essential features of a thoughtfully conceived RCR training and education programs for students, postdocs and faculty that will positively impact their research and scholarship?
2. How can we extend such RCR training to include researchers from other countries, particularly when international research collaborations are the focus of collaborative research and inquiry?

Data and Methods: Data gathered from experiences teaching RCR to undergraduates, graduate students, postdocs and faculty.

Results/findings: A thoughtfully conceived and comprehensive RCR training and education program for students, postdocs and faculty have a noticeable impact on the research and scholarship.

Implications: Effective, meaningful and comprehensive education and training programs should be the "norm" at universities.

CS17.2

"Recognize, respond, champion": Developing a one-day interactive workshop to increase confidence in research integrity issues

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In response to the increased international sensitivity to the issue, Ghent University has recently reconsidered its strategies toward research integrity issues, giving the topic a more central position in its overall research policy. In general, Ghent University aims at maintaining and further improving a qualitative research environment. The responsible conduct of research and confidence in responding to issues of research integrity are key elements in such a working environment.

One of the university's strategies to further foster the responsible conduct of research is the organization of generic training for all those involved in research (PhD students, postdocs, professors, administrative and technical staff, etc.) Four research coordination officers have been trained by an external partner experienced in helping organizations to develop internal trainings. This train-the-trainer approach has yielded a sustainable training format that addresses researchers from all disciplines and in all stages of their research careers. More specifically, the one-day interactive workshop (1) is fully aligned with Ghent University's overall research policy and regulations; (2) encompasses the full scope of research integrity (excluding ethical aspects of the research itself and other discipline-specific issues); (3) focuses on common examples and best practices rather

than on exceptional cases of serious misconduct; (4) addresses the four most common learning styles from the ELM (Kolb). At the end of the training the participants are expected to be more proficient in recognizing research integrity issues, more confident in responding to them, and fully ready to become research integrity champions within their research environment.

The proposed paper will briefly discuss the process of developing the one-day interactive workshop on research integrity, the training format that resulted from the train-the-trainer approach as well as the first try-out sessions and their evaluation.

CS17.4

"Train the trainer" on cultural challenges imposed by international research integrity conversations: lessons from a project

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Addressing research integrity and responsible conduct of research (RI/RCR) has gradually become part of the agenda of some Brazilian institutions, especially large universities receiving public funding. Requirements for RCR orientation has been announced by the São Paulo Foundation for Research Support (FAPESP), which sponsored the III Brazilian Meeting on Research Integrity, Science and Publication Ethics (III BRISPE, 2014). This formal demand for orientation on RCR is aligned with the need to implement "train the trainer" initiatives in Brazil, especially as senior researchers are expected to contribute to RCR discussions and actions in their own institutions. Here, we report on some of the outcomes of a "train the trainer" initiative that was part of a project supplement granted by the Fogarty International Center, in 2012. This initiative included a two-day workshop (30 participants from Rio and other Brazilian states) exploring RI/RCR in the context of the country's research system. The aims were the following: (1) Discuss RCR in the light of cultural constraints inherent to notions of ethics, integrity and the ethos of science; (2) Foster a critical attitude of participants towards doing research and communicating results in a multicultural international research network; (3) Develop participants' core competencies for them to have a broader role as authors and professionals in international collaborative projects; (4) Explore the relationship between RCR and contemporary ethical issues in the publication of biomedical sciences. In reporting on outcomes, we offer an overview of the approach made to stimulate participation of seniors. We also highlight aspects that may be relevant for those attempting to develop similar approaches at institutions in emerging countries such as Brazil. We believe "train-the-trainer" initiatives should combine international and local aspects of the scientific endeavor in different research systems and that Brazilian funding agencies requiring RCR activities should ask for the RCR proposal.

18. Research and societal responsibility

Chair: Nicholas Steneck, University of Michigan, US

CS18.1

Promoting the societal responsibility of research as an integral part of research integrity

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS18.1

The influence of science and technology on people's lives is growing, and there is also an increased awareness of the potential impact of scientific results and products on society and the environment. Accordingly, many resources developed to promote research integrity, such as guidelines, learning curriculums and the establishments of research ethics committees now include reference to the societal responsibility of research. But how do we best secure that the societal responsibility of research is integrated into research institutions and become a part of the individual researcher's awareness and conduct? Drawing on a recent

ethical review of petroleum research in Norway carried out by the Norwegian National Committee for Research Ethics in Science and Technology (NENT), I offer a critical discussion of how to best promote the societal responsibility of research as an integral part of research integrity.

In 1997 Joseph Rotblat suggested that an international ethics committee should be established to monitor and control science. In line with this, one alternative is to work for an obligatory ethical review of research projects raising concerns about the use and possible misuse of the research results. This would require a system similar to that developed by many countries and institutions within the area of medical research. Another alternative is to develop advisory research ethics committees and promote a public dialogue about the implications of scientific findings. This is the model pursued in Norway within science and technology today. A main problem with an obligatory ethical review is that it constitutes an infringement of the right to free inquiry. If an ethical committee has refused ethical approval, it is simply illegal to pursue the project in question. What may justify such an infringement? Traditionally, risk of physical harm and ensuring respect for research subjects have been main concerns. Within science and technology in particular, there may arise broad scale challenges related to possible negative, serious and irreversible effects of scientific results and products on society and the environment. Yet there are some important differences between minimizing physical injury on research participants and minimizing negative impacts of science on society and the environment - long term consequences which may be difficult to foresee and control. Drawing on recent experiences from Norway, I argue that while we should include the societal responsibility of research as an integral part of research integrity, it should be promoted through other tools than those traditionally developed within the area of medical research.

CS18.2

Social responsibility as an ethical imperative for scientists: research, education and service to society

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Research Integrity and Peer Review 2016, 1(Suppl 1):CS18.2

The issues this talk addressed was whether having many [ethical] standards may hinder science and fail to best serve society and, if so, what might be the prospects for a uniform set of standards. Several distinguished scientists contend that the variation in the norms and standards governing the work of scientists in different countries should be harmonized to advance effective and ethical collaboration in international research. Yet, such claims have not been accompanied by sufficient evidence that research has been hindered or that there is even a solid understanding of the nature and scope of the problem. In the absence of such evidence, it is premature to move toward a set of global standards.

If such a problem could be demonstrated, however, what challenges lie ahead in developing, adopting and implementing uniform global standards? Several were noted: (1) Whether to aim for minimally acceptable standards more likely to be adopted internationally, or work toward more comprehensive standards that might be less likely to achieve consensus; (2) Deciding on the level of participation in the process and what procedures are used to make decisions; (3) Determining what critical mass of countries is needed to be successful, taking into account social, economic, cultural, and political diversity among countries and their capacities for research and development; and (4) Calculate what countries perceive they will be getting in return for whatever investment they are asked to make, and the trade-offs countries will, or should, be expected to make.

Since international standards must ultimately be interpreted, understood, implemented and adhered to in the context of "local" policies and law, an implementation process should: (1) Be consistent with the goals of the standards; (2) Be efficient and effective; that is, do what they are supposed to do; (3) State requirements clearly and

transparently; (4) Employ sanctions for violations that are applied fairly and sufficiently enforceable to promote accountability; and (5) Inspire respect and confidence among those affected and earn general public support.

Finally, no oversight system will be foolproof. Some will ignore the standards and others will exploit loopholes. Those responsible for implementing oversight are fallible, so some violators will elude justice. The key is to be prepared in advance for what the response will be to such shortcomings.

CS18.3

The intertwined nature of social responsibility and hope in science

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As a component of society, the role of science and technology is to enhance human capabilities and function, and scientists and engineers have an array of associated responsibilities. The most obvious and immediate responsibility is accuracy and reliability in their work since both professional colleagues and the lay community must have confidence in the products of research. The Uppsala Code of Ethics for Scientists highlights their larger social responsibility "to refrain from and oppose ... research with potentially harmful consequences for the environment and for present and future generations." This implies the twin responsibilities of opposing misuse or abuse in the application of research findings, and attending to both the limitations and the foreseeable impacts of their work. Equally important, scientists and engineers, both as professionals and as members of society, have a responsibility to participate in discussions and decisions regarding the prioritization and appropriate uses of science in addressing societal issues and concerns, and to bring their specialized knowledge and expertise to activities and discussions that promote the education and advancement of students and fellow citizens, thereby enhancing and facilitating informed decision making and democracy. Increasingly these responsibilities are acknowledged and made more explicit in science and engineering education, among members of professional societies, and in the media.

This shared understanding of social responsibility affects the sense and level of hope within the larger, extended society. Webster's Third New International Dictionary defines hope as "desire accompanied with expectation of obtaining what is desired or belief that it is obtainable". In 2010 Nature published the results from a world-wide survey. Respondents to the Science & Society survey overwhelmingly agreed that scientists are more trustworthy than other public figures and that investment in science is the key to future well-being and economic growth. Hope, as Charles Snyder averred, is dependent on the "perceived availability of successful pathways related to goals". For many in science it is understood that social responsibility and hope are intertwined, but as the world becomes more individualistic and competitive, enormous pressures can pull scientists away from both internal and external social responsibilities at a time when they have never been more important to human progress.

CS18.4

Common barriers that impede our ability to create a culture of trustworthiness in the research community

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Research Integrity and Peer Review 2016, 1(Suppl 1):CS18.4

Without the public's trust, scientific research will cease. Other endeavors as trust-dependent as science place a high premium on assuring trustworthiness. For example, commercial aviation has learned to weave safety into the fabric of its activities, rather than place the public's trust essential for its operation at risk. One would think that by now the

scientific community would have similarly woven trustworthiness into the fabric of science. But it has yet to do so.

The problem is not that we do not recognize the importance of trust to our future; we do. The problem is that we tend to think about trust episodically, in response to scandal and controversy, rather than strategically and continuously. So we are ill-equipped to recognize and prevent the broad range of problems that impede high quality science and the trust it supports. We will remain so until we achieve a culture in science that aspires toward trustworthiness. This presentation will focus on four barriers that stifle progress toward such a culture.

1. We often ignore the role that systems in the research community play in supporting trust in research.
2. We focus too much on "bad apples," which distracts us from addressing much bigger problems that undermine trust.
3. We have excess confidence in the value of sponsor and publisher reforms, even though many of them are ineffective.
4. We overestimate the extent to which science self-corrects.

If we can learn to overcome these barriers, we can move beyond the current status quo, which leaves the prevention of problems to chance, and progress toward a culture of trustworthiness, that prevents problems by design. Such a culture will help secure a better future for science and the important benefits it pursues.

19. Publication ethics

Chair: Elizabeth Wager, Sideview, UK

CS19.1

The authors' forum: A proposed tool to improve practices of journal editors and promote a responsible research environment

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS19.1

Correspondence: Ibrahim Alorainy (alorainy@ksu.edu.sa) – King Saud University, Riyadh, Saudi Arabia The performance of journals' editors is formally evaluated by the editorial board and the publishing body, however, it is informally evaluated by the researchers with prior experience with the journal and the readership in general. In ideal situation, the formal evaluation should be able to influence the practice of journals' editors, but this is not necessarily true in the case of informal evaluation. The aim of this abstract is to propose a tool that empowers the informal evaluation and allows objective evaluation of journals' editors practice by larger group in a transparent and responsible manner. We propose development of The Authors' Forum, which is a portal for all researchers to share and document their experience with journals. Reviewers may also document their experience in this portal and the Editors may discuss and clarify issues related to their journals. The portal should be run by an organization that is independent from the publishing industry and the access to the forum should be open with searchable and sortable contents by specialty, journals' name, editor's name, ...etc. The positive practices are the rule and countless, but this abstract will address some documented anonymous examples of negative practices that occasionally occur, and these include:

1. Editor asking the authors to cite his/her journal or journals of the same publisher.
2. Editor asking the authors to resubmit an accepted manuscript after final revision to hide the delay in review process.
3. Editor rejecting an already finally accepted manuscript without justifying cancellation of acceptance.
4. Editor delaying the final decision on a manuscript until a similar manuscript by other researchers is published in the same or a different journal.

There is no effective way to document misconduct that could occur from the side of an Editor of publisher. On the other hand, majority of journals are doing great job in dealing with authors and reviewers. Sharing documented positive or negative experiences in the public domain will certainly help in promoting good practice. Such a tool may transform over time to a ranking tool showing to what extent Editors adhere to guidelines pertinent to relation with authors and reviewers.

CS19.2

Quantifying research integrity and its impact with text analytics

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS19.2

Text analytics, especially text similarity searching, that is the comparisons of paragraph-sized text sections for amount of similarity, has shown to be an efficient way to identify potential plagiarized and duplicate publications. Its use goes beyond comparing scholarly manuscripts, and can be used anywhere there are collections of text by individuals, spanning the internet (blog posts) to grant applications. Recently we compared all grant summaries by 5 funding agencies in the US and found a substantial number of funded grant/contracts with highly similar specific aims, hypotheses or goals. Fallout from this publication has included numerous requested government agency briefings, testimony, many individual investigations and the need to respond to subpoenas. This research and its aftermath will be presented. In addition, we have further analyzed the highly similar grant summaries in comparison to the published literature for the investigators. This analysis has been very revealing, for manuscripts were found to selectively acknowledge funding agencies, revealed additional funded grants that appear to support the same research, and show clusters of such behavior. These unpublished findings will also be presented. Finally, anecdotal evidence for false or revenge accusations of plagiarism will be discussed, as to how this can have dramatic effects on those accused and significant time/resource consumption by those that must respond to such accusations. Text analytics has been applied to plagiarism and grant fraud detection, but how effective has it been and what are the consequences of the "discoveries"? We applied text similarity searching to large databases, including MedLine and a database of funded grants from a variety of US Government and non-governmental agencies to identify those documents that had high levels of similarity. This resulted in several findings reported in various journals (Nature, Science, Bioinformatics). The research on grant funding overlap continues, by attempting to identify the network of publishing practices and grant acknowledgments in those papers as indicators of appropriate acknowledgement and to settle new ethics questions, specifically are PIs/authors properly acknowledging funding agencies? Additional computational and manual reviews of acknowledgements are being conducted. We have found tens of thousands of suspiciously similar pairs of publications in PubMed, at a ratio of 10:1 that are potential duplicate papers: potentially plagiarized papers. Retractions of these continue to be published. The grant funding overlap findings were initially reported in Nature, however, the downstream consequences will be reported here for the first time, including political implications (changes to publication timing), political briefings, investigatory briefings (Government Accountability Office, IGs offices of funding agencies) and legal action (subpoena of findings). In addition, we have found that by correlating the acknowledgements in papers of PIs found to have potential significant similarity in goals/hypotheses/specific aims, we have been able to identify additional potential funding overlap similarity. There are also biases to acknowledging funding agencies, with priority given to government funding at the expense of private agencies, in papers that are relevant to all the funded grants.

CS19.3**A closer look at authorship and publication ethics of multi- and interdisciplinary teams**

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Most studies on (un)ethical authorship and publication practices (e.g., ghost authorship, the rise of multi-authored publications, conflicts of interest) focus on specific disciplines in the natural and applied sciences – in particular, the biomedical sciences, medicine, physics and engineering – with much less attention paid to practices in the social sciences and humanities. But authorship practices are not standardized across these various fields, and so the different disciplines may have very different approaches to, and norms regarding, collaborative research, notably in terms of what is considered appropriate authorship roles and ranking in co-authored publications. Despite the growth in multi/interdisciplinary health research programs, very little work has yet focused on understanding these issues in the context of multi/interdisciplinary teams. We will thus present the results of several studies on two different multi/interdisciplinary fields, bioethics and public health. Our first set of studies involved an analysis of the diversity of authorship practices of bioethicists and the incongruity of authorship and conflict of interest policies of bioethics journals; from our second ongoing study, we will present preliminary empirical results from interviews of public health researchers about their practices of authorship assignment and ranking, and discuss the values, factors and reasons behind authorship attribution. Drawing on the findings of these two cases will allow us to examine important and as yet unanswered questions about authorship: Do researchers' disciplinary backgrounds shape authorship practices in multi/interdisciplinary settings? Are new issues or biases introduced when working in multi/interdisciplinary teams? To what extent do disagreements over authorship lead to more egregious misbehaviors such as interpersonal disputes, sabotage, or research fraud?

CS19.4**Invisibility of duplicate publications in biomedicine**

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS19.4**

Research question:

How are duplicate publications indexed in MEDLINE and are journals addressing them?

Data and methods:

Duplicate publications (DPs) should be retracted as they can lead to biased estimates of treatments in meta-analyses. In MEDLINE, identical or nearly identical articles are indexed with a DP tag even when a duplication notification has not been issued by a journal. We evaluated the reasons for DP indexing, journal handlings of articles indexed as DPs, and influence of DP indexing on article citation counts. We then re-evaluated the DP indexations in MEDLINE 12 months after public presentation of our findings at the 2013 Peer Review Congress. In the next phase we will try to determine the reasons for the lack of journal acknowledgment and correction of duplicate publications.

Results

On 16th January 2013, we extracted all MEDLINE articles indexed as DPs, and checked their linkages to notices or errata visible through PubMed or journals' websites. Of 1011 citations indexed as DPs, 774 (77 %) represented 401 different instances of DPs. The remaining 237 (23 %) citations were incorrectly indexed as DPs, most commonly for being simultaneous publications. Of 401 DP cases, 253 (63 %) occurred due to authors' error/misbehaviour (most commonly due to

submission of a single article to more than one journal) and 148 (27 %) due to publishers' error (most commonly due to identical publication of a same article in two different journal's issues). Out of 401 DP cases, 177 (44 %) were addressed by notices, but only 23 (5 %) were retracted. We found no differences between citation counts of original and DPs in the Web of Science, irrespective of the publication of notification of duplication. 12 months following the preliminary presentation of our findings 111 citations were no longer tagged as DPs in MEDLINE. The reasons behind journal lack of handling of DPs will be determined and presented at the conference.

Implications:

Despite existence of clear guidelines on how to deal with duplicate publications, half of DP cases in MEDLINE have not been addressed by journals and only 5 % were retracted. Publishers and bibliographic databases need to increase their efforts in properly addressing duplicate publications as well as in enhancing their visibility. In the next few months we will also explore the difficulties journal editors face when correcting, detecting and addressing duplicate publications.

20. The causes of bad and wasteful research: What can we do?

Chair: Lex Bouter, VU University, Amsterdam

CS20.1**From countries to individuals: unravelling the causes of bias and misconduct with multilevel meta-meta-analysis**

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We will present the first results of a 2-year project funded by the Office of Research Integrity, which analysed data from published meta-analyses to identify factors that push researchers to select, embellish and falsify their findings.

The willingness of researchers to engage in irresponsible research practices and misconduct is hypothesised to depend on a hierarchy of causes – going from the competitiveness of their research environment to characteristics of their personality, passing through the “softness” of their research methods and the level of social control exerted by collaborators. Most quantitative evidence around these hypothesised factors comes from survey and interview data. To yield conclusive tests and inform specific policies, such personal accounts need to be combined with direct evidence of the problems affecting specific fields.

We randomly sampled over 3000 meta-analyses from the biomedical and social sciences, extracted data from the primary-studies these meta-analyses are based upon, and thus obtained a standardized estimate of how each primary study over- or under- estimated the effect it was trying to measure. Thanks in part to the cooperation of the authors of the sampled meta-analyses, we compiled a data set of over 50,000 primary studies.

Using multi-level meta-regression analysis, we assessed how the likelihood to report exaggerated, selected and possibly manipulated results varied across disciplines, across fields, across countries and how it has changed over the last century. Further analyses will probe the effects of team and individual characteristics, including gender, career stage, productivity, team size and collaboration patterns.

Results, to be completed early in 2015, will provide highly robust and accurate tests of many common hypotheses on the prevalence and causes of publication and research bias as well as scientific misconduct, and will offer an empirical basis on which to discuss policies and initiatives to tackle bias and misconduct around the world.

Daniele Fanelli is an evolutionary biologist who specialized in the quantitative study of bias, misconduct and related issues. He is a member of the Research Ethics and Bioethics Advisory Committee of Italy's National Research Council, and is currently visiting professor at the University of Montréal, where he runs several research projects.

CS20.2**Reducing research waste by integrating systems of oversight and regulation**Gerben ter Riet¹, Tom Walley², Lex Marius Bouter³¹University of Amsterdam, Netherlands; ²University of Southampton, Southampton, UK; ³VU University, Amsterdam, Netherlands**Correspondence:** Gerben ter Riet (g.terriet@amc.nl) - University of Amsterdam, Amsterdam, Netherlands*Research Integrity and Peer Review* 2016, **1(Suppl 1)**:CS20.2

Can a system that integrates funders and/or institutional review boards (IRB), (equator-network.org-based) reporting guidelines, end-users and legal frameworks reduce the main sources of research waste? Using an analysis of the key players and components of our current mainstream science system, we will argue that it can. We also reflect on the reasons behind the success of the British Health Technology Program in ensuring that 98 % of funded work gets (fully) published: (i) formal contract stipulating the requirement to publish, (ii) withholding funds until contract terms have been fully met, (iii) availability of the HTA Monograph Series, (iv) blacklisting investigators with suboptimal performance on points i-iii. We argue that end-users and systematic reviews should play an important role at the stage of research program formulation and funding decisions. Text-mining algorithms are needed to compare research reports to grant submissions and research protocols and help detect selective reporting. The role of IRBs (that capture industry-initiated research, which funders may miss) should be extended to include monitoring of research reports and to prevent publication bias and other reporting biases. Worldwide, research waste has recently been estimated to run into the tens of billions of U.S. dollars annually. Research waste has been divided into four main components: irrelevant questions, bad methodology, selective and biased reporting, and incomplete description of interventions and research methods. These components should be tackled by redesigning the research system while ensuring efficiency and automation where possible. Given the magnitude of current waste, considerable investments in end-user participation, increased monitoring responsibilities for funders and IRBs, and software that compares publications against promises made in grant submissions and research protocols seem defensible.

CS20.3**What are the determinants of selective reporting?: The example of palliative care for non-cancer conditions**

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Palliative care is beneficial for patients with incurable cancer, but may also be indicated for older people dying from or with other life-threatening progressive conditions, such as dementia or organ failure. In addition to expanding its scope to more diseases, palliative care is recommended to start early and to not wait until the terminal stage. However, the efficacy of palliative care for patients without incurable cancer is still understudied. There are many small studies but these do not provide strong evidence. This is also related to complexities in doing palliative care research, including for example, ethical issues, the use of proxies if people are too sick to self-report, loss to follow-up, and difficulty in standardizing complex interventions. Therefore, creativity is helpful in designing and performing palliative care research. Along with strong convictions, we hypothesize that this elevates the risk of selective reporting and publication bias. For example, we noticed authors focusing on findings in favour of palliative care, and editors rejecting a paper because its results do not support a palliative approach. Authors also sometimes seem to report on research questions which were not part of the study protocol if the answers confirm the views of the investigator.

This anecdotal evidence calls for a framework to assess risk of selective reporting in a particular field. This will allow for assessment of the risk for selective reporting in comparison to other disciplinary fields. For example, strong convictions and 'soft' research may increase risk, but overall risk may be offset by palliative care rarely receiving support from commercial resources.

To identify risk factors for selective reporting in a specific disciplinary field we need a study comparing research protocols with subsequent publications of the results. This should also include evaluation of the assumptions behind the study protocol and therefore may integrate a qualitative part through employing a mixed-methods design. Further, a systematic review of the determinants of selective reporting in a more generic sense will allow for mapping how these may affect the field of non-cancer palliative care.

We are currently undertaking such a review and this should result in a list of putative risk factors or determinants of selective reporting. This may help risk profiling of a variety of disciplinary fields and may inspire further research on mechanisms and causes of selective reporting.

CS20.4**Perceptions of plagiarism, self-plagiarism and redundancy in research: preliminary results from a national survey of Brazilian PhDs**Sonia Vasconcelos¹, Martha Sorenson¹, Francisco Prosdocimi¹, Hatisaburo Masuda¹, Edson Watanabe¹, José Carlos Pinto¹, Marisa Palácios¹, José Lapa e Silva¹, Jacqueline Leta¹, Adalberto Vieyra¹, André Pinto², Mauricio Sant'Ana³, Rosemary Shinkai⁴¹Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil;²Brazilian Center for Physics Research (CBPF), Rio de Janeiro, Brazil;³National Agency for Complementary Health (ANS), Rio de Janeiro, Brazil;⁴Pontifical Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, Brazil**Correspondence:** Sonia Vasconcelos - Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil*Research Integrity and Peer Review* 2016, **1(Suppl 1)**:CS20.4

Plagiarism is part of most definitions of research misconduct, all over the globe. However, what constitutes misappropriation of, especially ideas and words in a scientific work seems to be controversial among scientists from different cultures and fields. Similarly, self-plagiarism and redundancy are non-trivial issues in the communication of science, as they include notions of originality and ownership. While many attempts have been made to investigate these practices among scientists and scholars, large studies collecting perceptions of plagiarism and related questions among PhDs from diverse disciplinary backgrounds are lacking. In Brazil, a survey investigating these perceptions among a diverse population of PhDs has been conducted, in partnership with the Brazilian Council for Scientific and Technological Development (CNPq). The Research Integrity Commission of CNPq, which established national directives for research integrity in 2011, invited more than 143,000 PhDs registered in the Council database to complete a survey about plagiarism, self-plagiarism, and redundancy (Oct-Dec 2014). The survey was completed by 25,213 respondents. We identified gender, age, state, academic level, type of institution (public or private), and international experience, among other factors. The greatest fraction of respondents was at federal and state institutions (75 %). Our preliminary results indicate that most respondents (97 %) agree with the US Office and Technology Policy (OSTP) definition of research misconduct, which holds for most research systems. Nevertheless, when it comes to sanctions related to allegations of plagiarism, included in the definition, different views are expressed by these PhDs. Regarding science and education policy, we show that the national survey is harmonized with the need for a broader approach to cultural and disciplinary factors that may influence notions of the responsible conduct of research in collaborative research networks.

21. Are there country-specific elements of misconduct?

Chair: Simon Godecharle, University of Leuven, Belgium

CS21.1

The battle with plagiarism in Russian science: latest developments

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS21.1

My previous report about struggle against plagiarism in Russian science was presented at the 3rd World Conference on Research Integrity in Montreal in 2013. Now I am going to discuss developments which took place between the two Conferences.

In Montreal I reported that in Russia “the issues surrounding research misconduct... became a matter of Big Politics and a cause célèbre as specific misbehaviors became public”. Such tendency was evident in last two years as well. The struggle against plagiarism had started as grass-root movement, mainly inside the Russian scientific community. Some civil activists also take part in the movement. In 2013 the Free Networking Community Dissernet was founded. Main field of its activity is examination of theses which were defended in previous years. To the beginning of 2015 more than 2000 theses with plagiarism were found. Cases of extensive plagiarism were documented in dissertations of many Russian high-ranking politicians and bureaucrats.

The important issue is interrelations between grass root movement Dissernet and authorities. Activists of Dissernet are especially interested in examination of theses defended by politicians and bureaucrats and as a matter of fact a lot of plagiarism, forged scientific publications and other flagrant violations of norms of research integrity were revealed in their theses. At the same time disclosure of wide involvement of these influential people, including deputies of the State Duma, some ministers, regional governors, heads of special services etc. in such practices makes them extremely hostile to Dissernet-related activities.

Now there are many known cases when high ranking officials were denounced by Dissernet starting with Minister of science in Moscow City local government Alexey Komissarov, who admitted his fault. Authorities cannot fully ignore results of examinations performed and disseminated by the Dissernet activists and in some cases are forced to react on accusations in scientific misconduct charged against rather influential persons.

CS21.2

Researchers between ethics and misconduct: A French survey on social representations of misconduct and ethical standards within the scientific community

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS21.2

Research question or thesis

The purpose of this survey is to determine the scientific misconducts (frequency and seriousness), their causes and how they should be addressed. It also aims at assessing the extent of researchers' adherence both to ethical standards and to compliance mechanisms.

Data and methods

Conducting a survey on that issue, about scientists operating in France, has been unprecedented. It has focused on a population made up of about 2000 researchers. The subjects were contacted through several means including an advertising in the scientific press, telephone contacts to the 80 French universities, a mailing operation with 2095 public research laboratories, direct contacts with 21 public research institutes as well as mailing lists of several French scholarly societies in the newsletters.

The survey was carried out through a self-administered online questionnaire. The answers were collected from October 29, 2013 to

November 5, 2013. The survey examines 1967 subjects who answered 126 questions. Data have been electronically collected through the software Sphynxs online and processed through the statistical software SPSS (Statistical Package for the Social Sciences) and SPAD.

Data have been processed through conventional methods of statistical analysis (univariate and bivariate tables) and Multiple Correspondence Analysis (MCA).

Results / findings

- 1) The survey evaluates how researchers assess the level of seriousness among a range of 26 misconducts. It reveals an extremely severe stance regarding almost all misconducts. It allows to classify these misconducts according to their seriousness and to compare this ranking to theoretical classifications provided by earlier research (Martison, Anderson, deVries 2005 and 2006).
- 2) The survey describes misconduct frequency depending upon the researcher's type of involvement as “author”, “witness” or “victim” of misconducts. It shows that misconduct is a widespread and prevalent phenomenon when the researchers are interviewed as “witness” of misconduct. That stands starkly in contrast with the weak reactions of institutions regarding misconducts.
- 3) The survey highlights several prevailing causes leading to committing misconducts. On the one hand, it stems from the competition between researchers and from the peer pressure. On the other hand, researchers are under the impression that these practices are a widespread phenomenon and that they remain in impunity.
- 4) Finally, the survey shows that researchers adhere both to ethical standards (displayed in charters and codes) and to their compliance mechanisms (by Ethics Committees). The normative and binding character of these tools is regarded as legitimate and effective means to prevent the phenomenon of misconduct.

Implications

- 1) The novelty of the survey lies in pointing to a wide range of misconducts. Unlike most surveys which focus on FFP (fabrication, falsification, plagiarism), this study offers a very broad view on the behaviours, their causes and their remedies.
- 2) It shows that researchers have a fairly homogeneous and universal perception of ethical values.
- 3) Contrary to a relatively widespread contest movement against institutionalized scientific standards of ethics, the survey reveals the researchers' adherence not only to ethical values but also to their compliance mechanisms.

CS21.3

Experience from different ways of dealing with research misconduct and promoting research integrity in some Nordic countries

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS21.3

The Nordic countries have a relatively long tradition for handling cases of possible research misconduct in a structured way i.e. based on coherent systems. Although the Nordic countries socioeconomically, culturally and with regards to organizing research activities are quite similar there are rather wide differences regarding mechanisms for dealing with research misconduct cases and/or enhancing responsible conduct of research. Denmark and Norway are among the few countries in the world where research misconduct is dealt with based on national legislation. Still, there are major differences between the two national legally based systems. It will be argued that dealing with research integrity on a legal basis raises serious challenges. However, on the other hand a legal context

may secure the rights of the involved parties and guarantee transparent uniformed processes. In a third Nordic country, Finland, one relies on a voluntarily, locally based system but with a strong national component. An overview of known research misconduct cases in the three countries will form a found basis for discussing strengths and challenges concerning the different ways of dealing with research integrity in some Nordic countries. Although it seems to be widely accepted that one cannot simply transfer the structure of one country to another there are a lot to be learned from different national experiences in order to enhance dynamic ways of dealing with research misconduct.

CS21.4

Are there specifics in German research misconduct and the ways to cope with it?

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS21.4

Motivations others than interest in research are important: A doctor's degree is considered relevant for prestige and authority. The title is normally documented in the German passport. The party Die Grünen did not succeed to change the corresponding law. For many physicians or dentists the titles Dr. med. or Dr. med. dent. appear to be necessary on their door plate in order to see enough patients. The Wissenschaftsrat (German Council of Science and Humanities to the German Government) proposed already in 2002 that a title like the MD should be granted with the completion of the medical education. Nothing changed. A habilitation thesis is more or less mandatory for a chief physician. Normally 10 publications with first or last authorship have to be published to reach this goal, reducing the time to get clinical experience. In the German Grundgesetz in Article 5 the Freiheit der Wissenschaft (freedom of science) is formulated as a fundamental right. The state tries to interfere as little as possible in questions concerning research misconduct. Although the Deutsche Forschungsgemeinschaft (DFG), the main funding agency, requires that all recipients of funds have to comply with detailed DFG proposals for GSP, investigations and sanctioning of misconduct normally has to be done decentralized by the institutions that receive the funding. If inconsistencies in publications are detected, efforts of universities to correct them may depend on the compliance of the authors because administrative law has to respect the freedom of science. Personal rights appear to be in conflict with the aim to correct the scientific record. If sanctions against scientists are enforced, the prohibition of violation of privacy has to be respected; in many cases misconduct will stay anonym.

22. Research integrity teaching programmes and their challenges

Chair: Paul Taylor, University of Melbourne, Australia

CS22.1

Faculty mentors and research integrity

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS22.1

Correspondence: Michael Kalichman (mkalichman@ucsd.edu) - University of California San Diego, San Diego, USA Courses, workshops, lectures, seminars, and online approaches have now been used in the U.S. for over 20 years to promote responsible conduct of research (RCR). Despite these efforts, worries about research integrity have only increased. This is perhaps not surprising given considerable evidence that what happens in the research environment is more important to behavior than one-time educational experiences. In an attempt to move research ethics education from the classroom into the research environment, a workshop curriculum was developed to provide faculty with tools and resources to foster discussions about RCR with their trainees and other members of their research team. The resulting curriculum has now been

used in numerous settings, and has been very well-received by the participants. Interestingly, an unexpected finding is that when trainees of these participants were asked about the extent to which the approaches described in the workshop had been used by their mentors, the vast majority of the respondents reported that this was already occurring - before their mentors had taken the workshop. On the other hand, the number of faculty willing and interested to participate in these workshops has been disappointingly low. Taken together, it may be that those faculty already most positively disposed to discussing research ethics are few in number, but the ones who are most likely to choose to participate in such a workshop. Efforts are continuing to attract a larger audience to the workshops as well as to look into the long-term impact of these workshops on the trainees of the participating faculty. (Supported by National Science Foundation Grant #1135358).

CS22.2

Training the next generation of scientists to use principles of research quality assurance to improve data integrity and reliability

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS22.2

The scientific community and the public it serves, are troubled by reports that demonstrate an increase in the number of research studies that cannot be replicated, and the frequency of scientific fraud or dishonesty events. System level strategies for improving research reliability are required to address these trends. The integration of principles of quality assurance (QA) into discovery (pre-regulated) research programs is one way to mitigate threats posed by error, questionable research practices, and fraud. Quality assurance management systems are designed to improve and maintain the precision and accuracy of a product, and to establish routine performance. The most important products resulting from academic research institutions are research data, and the next generation of research scientists.

Research data integrity (accuracy, consistency and traceability) is the cornerstone of sound science, as well as a critical requirement for research reconstruction. In regulated research, data integrity is supported by required QA oversight. However, QA programs are not present in most discovery research environments, nor are training initiatives implemented to ensure that strategic, simple, and sustainable QA practices are adopted. As a result, scientists are not familiar with routine QA practices, and they are denied the opportunity to use them to improve data reliability. This (nearly universal) limitation constitutes a regrettable and significant gap in our scientific training programs, and models for addressing this gap are needed.

A strong case can be made for centralized support of QA initiatives targeted at research data quality. However, individual and team approaches to integrating QA into research settings are also possible, and may be scalable based upon initial proof of concept trials. Examples of such trials performed at the University Of Minnesota College Of Veterinary Medicine (St. Paul, MN, USA) include single investigator, and research consortium, adoption of voluntary QA practices facilitated by scientists with QA expertise. Attempts to further address the training gap include a research quality assurance toolkit (www.michelsonprizeandgrants.org/resources/qa-toolkit). This freely-available resource was created in collaboration with a research foundation (Michelson Prize and Grant Program; Found Animals Foundation, Inc, Los Angeles, CA, USA) to promote the voluntary adoption of QA practices among foundation grantees. Further effort is currently underway to create additional QA tools and templates that can be used by research scientists and mentors.

Increasingly, scientists must provide credible assurance that their data are accurate and can be replicated. Academic institutions should seize the opportunity to promote scientific excellence and improve research training by introducing innovative QA programming and promising institutional best practices.

CS22.3**Fostering research integrity in a culturally-diverse environment**

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We are investigating a promising approach to research integrity education in a multi-cultural environment using intellectually-safe communities of inquiry of graduate and postdoctoral students. This approach uses philosophy as an activity, a practice of thinking clearly and communicating effectively, but does not rely upon any specific ethical or moral theory. It has been used successfully in racially-diverse high schools, universities on the U.S. mainland and Europe, China, Kenya, Mexico and Japan, and in a recent pilot project with the state legislature. This approach to ethics education has proven effective in engaging women, persons with disabilities and underrepresented minorities in conversation, cooperation and community-making. It is especially conducive to participation by persons who are attending a university outside their home country.

The central research question in this study is: In what ways, if any, does participation in the communities of inquiry impact students?

This study consists of the creation of a research integrity community of inquiry, and of a method of assessing its effectiveness. As one measure of effectiveness, we are developing a survey based on a sense of coherence (SOC); a generalized set of beliefs about oneself and one's world that support successful responses to stress. SOC has been found to be relevant not only to individuals, but also as a group characteristic, which helps to deal successfully with collective stressors. In addition, participants provide written reflections, such as how they will incorporate what they have learned into their current and future research practices. Trained facilitators observe community interactions as a comparison with the student responses to the survey and reflection prompts.

The community of inquiry model is an innovative approach to integrating responsible research practices into individual and group behavior and expectations. If effective, it will improve both the method of training/instruction and the overall research environment.

CS22.4**Towards a standard retraction form**

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Retractions are often used as a proxy for publication quality. Retractions with cohorts of various sizes have been studied over differing time periods. These studies have pointed out that there is often no clearly stated reason for retraction and, when given, these reasons are often lacking in detail. The difficulty with interpretation has never been quantified, however an absence of explanation was cited for 5–12 % of retraction notices. Following our study on retraction notices issued in 2008, we recommended the use of a retraction template. This template would meet the pre-requisites for the COPE (Committee On Publication Ethics) retraction guidelines using very simple tick boxes: who is retracting the article (authors/institution, publisher, editor)? What is the reason for the retraction? What is the history of errata/ expressions of concern? Does the retraction invalidate the data? A free-text box would allow the editors to add any information they consider useful.

The template has been submitted for discussion to the members of COPE and the European Association of Science Editors (EASE). It elicited differing opinions on its form and use. It was noted that negotiations with authors usually occur over the wording of a retraction: will authors be willing to accept publication of a form with just tick boxes? Also noted was the need to strike a balance between revealing sufficient information and what can legally be said in a retraction notice. A standard form is rather black and white whereas individual

cases are often nuanced. There was concern about putting something marked as fraud or plagiarized into the public domain. Would a standard retraction form be for use in-house and/or for publication? Finally, while many issues are still under discussion, and editors' associations should have their say, we feel that transparency is mandatory, and forms, or at least part of the forms, should be made public.

23. Commercial research and integrity

Chair: Carthage Smith, Organisation for Economic Co-operation and Development OECD, France

CS23.1**The will to commercialize: matters of concern in the cultural economy of return-on-investment research**

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS23.1**

Research question or thesis:

The ethos of return-on-investment is often seen as inevitable in new scientific initiatives. The proposition of this paper is that while integrity in research is increasingly attenuated when embedded in these circuits of investment-reward thinking, it can remain an active agent counteracting the all-out commodification of scientific knowledge.

Data and methods:

In this paper, I consider how the will to commercialize is affirmed in the work milieus of academic health researchers, in the products of their research, and in concert with affirmations in the larger institutional funding milieu. The paper draws examples primarily from findings of both quantitative and qualitative investigations focusing on emerging health researchers at a medium-sized Canadian university, Dalhousie University, and secondarily from the findings on work of marketing-influenced, museums-based paleobiologists at Toronto's Royal Ontario Museum. Nearly 50 Interviews from both settings are drawn upon in this paper.

Following the network-tracing methods of Anthropologist Anna Tsing ("Inside the Economy of Appearances") and Sociologist Michel Callon ("On the Embeddedness of Markets"), the paper follows the continuities between workaday scientific practice and discourse, the institutional ethos at play in each instance, and the larger cultural economy of knowledge production prevalent in free trade oriented states like Canada, and others such as members of the G-20 group of trading nations, where scientific knowledge production is subjected increasingly to managerial considerations of economic efficacy. It then identifies whether and how 'matters of genuine concern' are asserted and enacted in the actions of researchers, at times running contrary to the will to commercialize.

Results / findings:

The expanding ethos of everyday scientific research in neoliberal institutional circuits is the presumption of embedding new knowledge in regimes of property and return on investment. Much as Riles (2011) has identified how 'collateral knowledge' (the premise of pursuing credit arrangements) organizes and animates the everyday activities and decision making of financial regulators (legal experts), the findings of this research indicate that researchers take for granted, almost tacitly, that the imperative of research is to commercialize. Research integrity, much like financial integrity, while certainly attenuated by this intensifying and taken-for-granted will to commercialize, is restored when young researchers speak to the need for care in stewarding of facts and findings, in the face of shifts in public concern.

Implications:

This paper is part of the work of a team of researchers supported by a Canadian Institute of Health Research (CIHR) Grant on Commercialization in early career stages of biomedical researchers in Canada. A significant implication derives from contending how matters of concern (moral integrity in research, cf. Stengers 2011) can act to re-compose practices away from and displacing the over-determining forces that would only see the value of knowledge in terms of its commodifiability.

CS23.2**Quality in drug discovery data reporting: a mission impossible?**

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The growing number of publications on poor reproducibility of results in preclinical research is concerning and impacts more and more the way pharmaceutical companies work with their contractors and collaborators to improve reliability of data. One can think of many reasons for reproducibility issues, such as poor documentation or technical limitations of the methods used. However, more and more published cases are brought up involving biasing, fabrication or falsification of data. It goes without saying that these cases are not only undermining the credibility of scientists, but they are also incentivizing teams in the pharmaceutical industry, such as our team at Janssen Research & Development (JRD), to look for ways to minimize and detect data integrity issues in our own labs as well as in contract labs that generate data that are used in our programs.

Janssen Research & Development, as a research driven pharmaceutical company, strives towards leadership in setting data quality standards within its research community. We not only aim to bring innovative molecules to the clinic, but we also want to ensure that these are supported by high quality, sound and reliable experimental evidence as well. To help in reaching this goal, our team has spearheaded a quality maintenance program for our global discovery organization, which is built on close partnership between discovery scientists and the QA organization.

Retaining the vital creative spirit of our discovery organization while requiring thorough and accurate documentation of research data is often challenging, but our team is convinced that our quality maintenance program will help the organization achieve its research integrity goal and contribute to the success of development decisions for many compounds in the future.

CS23.3**Instituting a research integrity policy in the context of semi-private-sector funding: an example in the field of occupational health and safety**

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS23.3**

This presentation reports on the challenges facing the development and application of a code of research integrity in an organization which has a dual mandate to conduct and fund research in the context of semi-private-sector funding. The challenges are further amplified by the structure of governance for which decision-making pertaining to the research agenda is influenced by interest-driven groups involving employer-worker representatives, as is often encountered in the field of occupational health and safety. In addition, lines of conduct need to be defined for members of follow-up committees that are set-up to emphasize the application of the results in the workplace. This presentation will provide an account of the various steps which have led to the development of a code of research integrity for the type of research organization concerned and will describe how the various challenges have been dealt with.

24. The interface of publication ethics and institutional policies

Chair: Jelte Wicherts, Tilburg University, Netherlands

CS24.1**The open access ethical paradox in an open government effort**

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS24.1**

Governmental open science is not only a trend and there are many logical and ethical bases to support Open government initiatives. By definition, open science has three key elements favoring an open access to peer-reviewed articles, maximizing the release of open research data and increasing public engagement. Governmental science and technology initiatives being funded via public money, the logical approach is to make it available to public increasing transparency, efficiency and accountability. Moreover, open science becomes an ethical approach when public funding is used. However, there are different types government S&T investments; science performed by government employees, science performed by external researchers under contract and science funded by federal grants.

The ethical paradox appears mainly with the open access to peer-reviewed articles has, even though many versions of open access journal exist, an increasing numbers of journal are now offering exclusively this model of publication with varying fees. It is not rare that scientists have to choose between open access journal costing 4-5 thousand dollars while hardcopy could cost less than 1 thousand. Moreover, just last year, more than 6000 new scientific journals were launched in with the vast majority published by predatory publishers. Facing this increasing offer, researchers need to use their funding appropriately to reach a scientific openness and ethically to justify the use of the Public money. The question is to which extent and how to avoid those predatory publishers. A system to promote responsible research in this context becomes a crucial need!

CS24.2**How journals and institutions can work together to promote responsible conduct**

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Research Integrity and Peer Review 2016, **1(Suppl 1):CS24.2**

There is a need for improved approaches for how institutions and journals can work together in an increasingly visible arena of research misconduct. The investigatory process can be challenged with the scientific community's need or want to know about allegations and findings of misconduct. This talk explores how journals and institutions have different perspectives and possible ways institutions and journals can cooperate.

CS24.3**Improving cooperation between journals and research institutions in research integrity cases**

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Scholarly journals have a responsibility for everything they publish and should ensure that corrections or retractions are issued when publications are found to be unreliable (due to misconduct or honest error). However, journals and publishers are not equipped to investigate cases of suspected misconduct and therefore rely on research institutions to do this. Tensions may arise between journals' needs for information about misconduct cases (e.g. to enable them to retract unreliable articles or alert readers to potential problems or on-going investigations) and institutions' requirements to keep investigations confidential (which may be enshrined in policy or law). Uncertainty about the correct procedures may also make both journals and institutions unresponsive to one other and reluctant to share information. Practical and detailed guidelines are needed, building on those published by COPE in 2012 and the work of the Focus Session at WCRI in 2013, to help journals and institutions understand each other's roles and responsibilities and to improve cooperation over cases of suspected and proven research or publication misconduct. We plan to develop such guidelines, in consultation with both institutions and journals.

25. Reproducibility of research and retractions

Chair: Ivan Oransky, Retraction Watch, US

CS25.1

Promoting transparency in publications to reduce irreproducibility

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS25.1

The replication and corroboration of research results is central to the scientific process. Open sharing of results, data, and research methods can accelerate scientific advancement and discovery. Yet the inability to reproduce published results, especially in preclinical disciplines, has been reported with increasing and alarming frequency, prompting a community-wide debate. The complex problem will take many stakeholders to fix, but journals have an important role to play in promoting transparency and improving reporting to facilitate interpretation and replication. We will share the experience of our journals and discuss efforts in the publishing community to improve reporting standards for preclinical research. We will also discuss the importance of credit and incentives and will describe some new avenues that are being explored by our publications to more effectively share data and research methods associated with papers – while ensuring discoverability, interpretability and reuse.

CS25.2

Retraction notices issued for publications by Latin American authors: what lessons can we learn?

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS25.2

Research question:

Retractions increased in the last decades, and recent research indicates that, in high-visibility databases such as Pubmed, misconduct accounts for most retraction notices. Several reasons have been proposed to explain this raise and the increasing number of misconduct cases in publications. However, we do not have a complete picture of the problem, as criteria to retract papers are not consistent across journals in the broader context of scientific publishing. This scenario thus calls for a careful look at retractions and at the relationship they may establish with their research environment. Although these notices may not exactly reflect the real motivations for authors to retract papers, our question is whether they can enrich our understanding of authors' motivations.

Data and methods:

We addressed this question by drawing upon retraction notices issued until September 2014, made available through two major Latin American/Caribbean databases: SciELO and LILACS. Retraction notices were searched and independently verified by three researchers, using the keywords "retracted", "retraction" "withdrawal", "withdrawn", "removed" and "redress", followed by an analysis of the content of the documents.

Results:

Thirty retraction notes were located, almost all of which co-authored by Brazilian authors. We identified that plagiarism is recurrent and that vagueness does not seem to be prevalent, what "goes against the grain". For instance, some of the notes included lengthy considerations on the nature of plagiarism or on the reasons leading to the event. Only four notes did not state reasons for retraction.

Implications:

We note that these documents may potentially be used as signposts to inform discussions in Latin America on research integrity. Also, they can help the research community in Latin America and The

Caribbean better understand the role of incentives for productivity in the alleged retraction reasons.

CS25.3

A preliminary report of the findings from the Reproducibility Project: Cancer biology

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS25.3

It's a common belief that research that builds upon previously published findings has reproduced the original work. However, because of current incentives that promote innovation over verification, performing or publishing direct replications is rare. The Reproducibility Project: Cancer Biology is an open effort to identify predictors of reproducibility in preclinical cancer biology research. We identified 50 high impact cancer biology articles from a 2010 to 2012 publication year sampling frame, of which a subset of experimental results will be replicated. Quality assurance will be maintained by using a Registered Reports publishing format in which peer review of experiments and protocols is conducted prior to data collection. The resulting open methodology and dataset will provide evidence about the reproducibility of high-impact results, and an opportunity to identify predictors of reproducibility. Credibility of research will be maximized through persistent efforts to align daily practice in the laboratory with the scientific values of openness and reproducibility. We will discuss the outcomes of this project so far and their implications for the understanding of research integrity.

26. Research integrity and specific country initiatives

Chair: Jose Roberto Lapa e Silva, Universidade Federal do Rio de Janeiro (UFRJ), Brazil

CS26.1

Promoting research integrity at CNRS, France

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS26.1

The ethics committee of CNRS (COMETS) in France put forward a 35 pages guide "promoting responsibility and integrity in research" that is intended for use in all disciplines covered by the eleven CNRS research institutes.

The CNRS governing boards approved its principles in June 2014. The guide was sent to all CNRS directors with an official recommendation that they forward it to all personals including teaching personals, as a large fraction of laboratories in France are under the leadership of both CNRS and universities.

The guide recalls that the principles of integrity must be observed in the practice of research, in spite of the strong pressure researchers face fighting for funding and pushed by the quest for excellence in a highly competitive context. The guide stresses the point that misconduct covers a large spectrum far beyond the well-documented cases of fraud. It provides guidelines for good practices in publications, and recommendations of how to deal with evaluation, conflicts of interest, and relationships between science and society. The need for careful training of young researchers by group leaders is also outlined, with indications how to deal with harassment.

Besides the guide, the COMETS and CNRS are engaged in the process of elaborating a national chart of research integrity together with other research institutions including universities. The general principles of the chart will then be adapted to the specificities of each institution.

CS26.2**In pursuit of compliance: is the tail wagging the dog?**

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS26.2

Globally government funding for Higher Education Institutions (HEI's) are on the decrease, whilst non-subsidy funding from the private sector and other sources are increasing. With more external funding from Funding Foundations, Private donations and Industry, HEI's are forced to operate in similar ways than the private sector, and thus are accountable and regulated to government, the public and the external funders. HEI's are faced with the challenge to balance their public and private interests, and as a result a new type of HEI has formed – a public and private sector hybrid.¹ Unfortunately, this latest trends poses a further challenge for HEI's, as the private sector is strictly governed by legislation and corporate governance principles, to which HEI's has to comply with in addition to the relevant HEI-specific legislation and government compliance requirements. It is not only a challenge for top and senior management to address, but are deeply felt by academics and researchers at HEI's who are dependent on sourcing research funds from the private sector and other non-subsidy funding institutions to be able to deliver on their academic priorities, to perform research, and to comply to a whole range of compliance requirements, legislation (sometimes conflicting between the private sector and the HE-sector) as well as internal policies and rules.

This issue was explored from a Research Contract Management perspective and recommendations were made on how to change from 'compliance officer' to that of providing strategic direction to facilitate and direct the institution's culture to migrate from compliance and conformance to performance. The basic theory around compliance, conformance, risk management, governance and performance were discussed to provide an overview to the audience.

Migration from compliance to performance through strategic direction can be achieved through (a) adopting Servant leadership principles (by Robert Greenleaf, 1970), (b) by translating the complexity of compliance to a more understandable format to researchers, (c) to take care not to overcomplicate and overregulate during policy making and implementation, as well as using the opportunity to add value when implementing a policy and not merely seek for compliance, (d) to be administratively efficient and effective, and (e) to inspire other support divisions to also strive for strategic leadership and facilitate contact between different internal and external stakeholders. Practical examples were discussed to illustrate above points.

References:

1. Higher education is evolving. As the business model changes, the governance model must too. Deloitte LLP and affiliated entities. Permission obtained from Nina le Riche.

CS26.3**Newly established research integrity policies and practices: oversight systems of Japanese research universities**

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS26.3

The presentation outlines new policies and practices in promoting research integrity in Japan. The Japan Society for the Promotion of Science (JSPS) and the National Science Foundation (NSF) organized a co-sponsored workshop on research ethics at the University of Tokyo in September 2014. The Presidents of the Japan Association of National Universities (JANU), Japan Association of Public Universities (JAPU), Federation of Japanese Private Colleges and Universities Associations (FJPCUA), and Science Council of Japan (SCJ) published a joint statement named "Joint Statement for Enhancing the Integrity of Scientific Research" to require Japanese research institutions and universities to establish mandatory responsible conduct of research training programs for all researchers in December 2014.

In addition, the presenter introduced the emerging trends surrounding the development of the research integrity policy in Japan. Some

functions and structures of the Ministry of Economy, Trade and Industry (METI), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Health, Labour, and Welfare were integrated and merged to establish a new government agency called Japan Agency for Medical Research and Development (AMED) in April 2015. This new agency will have a comprehensive research finding structure and support health and medical research and development.

Researchers in the fields of cancer, neurosciences, infectious diseases, incurable diseases, medical technologies regenerative medicines, genomic medicines, drug discovery, and medical devices, and others are like to receive research funding support from AMED. It is also expected to allocate research funds efficiently to institutions and researchers. Many organizations not only domestic research institutions but also multinational private sectors look for research and development opportunities in health and medical research in Japan.

The Top Global University Project is a new government funding project that aims to enhance the international compatibility and competitiveness of higher education in Japan. MEXT established this project in April 2014, and would provide prioritized financial support to the universities that would lead the Japanese higher education internationalization. The selected universities in the project will develop comprehensive internationalization policies in research and education. In particular, the "Type A" institutions are expected to promote internationalization in research and be ranked in the top 100 in world university ranking systems. The presenter examined and compared the institutional research integrity policies of the seven Japanese national universities that are part of the Top Global University Project.

27. Responsible conduct of research and country guidelines

Chair: Sonia Vasconcelos, Universidade Federal do Rio de Janeiro (UFRJ), Brazil

CS27.1**Incentives or guidelines? Promoting responsible research communication through economic incentives or ethical guidelines?**

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS27.1**Research question**

In addition to the pursuit of education and research, universities and other institutions of research and higher education have a commitment towards the so-called "third mission" concerning service, science communication and public outreach activities. How may national guidelines for research ethics contribute to improve national systems promoting responsible research communication?

Data and methods

The presentation is based on written sources and documents related to the implementation since 2004 of a new performance-based funding system for the national research system in Norway. This economic discourse is subsequently compared to the ethical discourse as outlined in the Guidelines for Research Ethics in the Social Sciences and the Humanities (rev. ed. 2005).

Applying a critical discourse analysis, the aim is to emphasize that while quantitative indicators were successfully implemented for both education and research, it proved impossible to develop similar indicators for third mission activities. Thus, the economic incentive system implemented in Norway since 2004 failed to reward one among the three main missions of universities and other institutions of research and higher education.

At the same time, in 2004-5, the Norwegian Guidelines for Research Ethics in the Social Sciences and the Humanities were being revised, introducing new elements and attention to the importance of science communication. Thus, the ethical guidelines highlighted a series of third mission activities which were not represented or rewarded in the new performance-based funding system.

Findings and implications

The unsuccessful attempt to create an indicator for performance-based science communication raises a fundamental critique concerning the integrity of the current funding and reward system in Norway. Meanwhile, the guidelines for research ethics offer another way of improving and institutionalizing third mission activities in universities and research institutions. Based on the Norwegian experiences, the talk will conclude by comparing the use of incentives and guidelines respectively in the attempt to encourage responsible service, science communication and public outreach activities.

CS27.3

Responsible conduct of research: a view from Canada

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS27.3

As Executive Director of the University of Alberta's Research Ethics Office and the University's Integrity Officer, I have been involved in the federal Tri-Agency Framework: Responsible Conduct of Research (2011) for the past two and half years. We are one of the largest research-intensive universities in Canada with nearly \$500 million in sponsored funding in all areas of research: biomedical, health, natural sciences, engineering, social sciences, humanities, and fine arts. Since obligations under the Tri-Agency Framework affect individual researchers and research teams as well as institutions, it has become clear to us that we need to increase our institutional educational efforts in order to ensure compliance with the Framework requirements. This presentation will provide both a brief overview of how Canada has scoped a national framework for the responsible conduct of research (RCR) and the ways in which one institution (the University of Alberta) has sought to adapt its research policy and procedures in order to meet new standards.

Note: We would hope that this presentation would provide others (not just in Canadian institutions but other similar research institutions worldwide) with the possibility of seeing some interesting solutions to developing and implementing good RCR policy and then educating researchers in a pro-active way to achieve compliance.

CS27.4

The Danish Code of Conduct for Research Integrity: a national initiative to promote research integrity in Denmark

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In Denmark public trust in science is at a very high level. Despite recent high profile cases of scientific misconduct up to 91 % of the population find research in Denmark trustworthy. To maintain and further strengthen the trustworthiness and high integrity in Danish research the Danish Ministry of Higher Education and Science together with all Danish universities, the sector research institutes of Denmark, the Danish Council for Independent Research, and the Danish Council for Strategic Research, established a national Danish Code of Conduct for Research Integrity in 2014.

Based on three basic principles of research integrity; honesty, transparency, and accountability, the Code presents a set of six commonly accepted standards on responsible conduct of research, a set of guidelines on teaching, training, and supervision, and, finally, a set of guidelines on how to respond to breaches of responsible conduct of research. These elements are intended as guidance tools for researchers and their institutions in their day-to-day work. The Code embraces all fields of research, while acknowledging the fact that the applicability of the standards for responsible conduct of research may differ between various fields of research.

The Code is not a legally binding document but provides the research community with a framework to promote commonly agreed principles and standards and it aims to support a common understanding and common culture of research integrity in Denmark. The

Code is intended to provide a common foundation upon which institutions are encouraged to further develop policies and procedures for promoting research integrity within all fields of research.

The Danish Code of Conduct for Research Integrity was published the 5th of November 2014. All Danish universities and major public and private research funding agencies have adopted the Code.

Link: <http://ufm.dk/publikationer/2014/the-danish-code-of-conduct-for-research-integrity?searchterm=code%20of%20conduct>.

28. Behaviour, trust and honesty

Chair: Daniel Vasgird

CS28.1

The reasons behind non-ethical behaviour in academia

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS28.1

Many professions have been under attack in the last decennia due to unethical practices, especially the business world. Despite the positive qualification and high ethical standards of science, some cases have also recently occurred in academia. What are the reasons for unethical behaviour in academia, and do they differ with business?

We will try to make an inventory of the reasons for unethical behaviour and built on Fassin's analysis of the reasons for unethical behaviour in business and entrepreneurship, presented in the *Journal of Business Ethics* (2005).

the pressures from stakeholders: shareholders, personnel, customers, suppliers, banks, government, media, environment the evolution of society - the individualism of people - norms the globalisation of the economy the short-term tactics the dominance of financial considerations short-termism of the stock market - anonymity of the individual investor the 'juridisation' of business - Anglo-Saxon model the inefficiency of the juridical system for business: time and cost the disproportional importance of communication/media the prevalence of show versus content: bad examples the role models - television: media reality shows - politics - sport the reward and evaluation system of business and of managers: results - stock price.

The academic world likes to present itself as completely different from other organizations, especially opposed to business; it has other objectives, organisation, rules and norms. Science pursues the advancement of knowledge, for the progress of society and the benefit of mankind. This quest is disinterested and idealistic, with the well-known Merton's characteristics of intellectual honesty, integrity, organized scepticism, disinterestedness, impersonality (Merton, 1942, 125-126, 318). Science is therefore considered as a noble activity.

We will demonstrate that academics despite their perceived differences, are confronted with similar problems. Academics just as "entrepreneurs experience powerful competitive market pressures so keenly that these forces may alter their perspectives on ethics" (Hanafey, 2003).

We will analyse the motives of academics, and their psychology, and compare it to business people and entrepreneurs. We will compare the context of the university in a changing environment. Just as entrepreneurship, academia is about achievement and success. Both operate in a sphere of high international competition and the desire to beat the other party in a competitive environment. Facing such pressures, "numerous rationalisations lead to unethical behaviour from usually intelligent, honest people who transgress the border between right and wrong" (Gellerman, 1986). As in all human activity, the psychological side is a very important facet. Academics just as entrepreneurs want to succeed; the last thing they want to do is fail. Conflicts of interest between personal interests and stakeholder interests do also occur in academia, just as abuse of power.

Our conclusion is that with the globalisation of the economy and innovation, the perceived uniqueness of the academic world has slightly diminished. Academic leaders should implement the ethical discourse in the entire organisation. This requires the right attitude of all individuals in the whole organisation, in concordance with the sense of honour of the academic community.

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CS28.2

The psychological profile of the dishonest scholar

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS28.2

Current psychological practice would support the programs that many institutions are implementing to teach research integrity to scholars. It is best practice to structure the context in which ethical behavior ought to occur by training scholars: to know the rules and principles; to recognize when these are relevant to their conduct; and to commit to behaving in a manner consistent with the rules and principles. Nonetheless, every institution has scholars who are found guilty of scholarly misconduct and admit that they ignored what they knew to be right. Knowledge about psychological factors associated with research misconduct can improve our ability to maximize proactive efforts to foster research integrity. The dishonest scholar is characterized by a cluster of socially malevolent personality characteristics, as shown in the empirical literature in psychology. The dishonest scholar lacks conscientiousness, is preoccupied with the self, disregards social norms, and is willing to manipulate others. Changing such a "dark" psychological profile is notoriously difficult. Someone with a "dark" psychological profile has difficulty in recognizing and respecting another's perspective; an inability to regulate his/her emotions; and a high tolerance for risk and punishment. These skill deficits hamper his/her ability to engage systematically in the processes that underlie our research integrity training programs. Although people in general respond better to rewards for meritorious behavior, the potentially dishonest scholar may in fact be deterred from research misconduct by severe sanctions.

Research in our laboratory demonstrated that students who admitted to having engaged in relatively high levels of academic dishonesty described themselves as socially irresponsible, impulsive, callous and, not surprisingly, uncaring about others' opinions of them. When presented with scenarios of another student tempted to engage in academic dishonesty, the self-admitted cheaters indicated that, if they found themselves in that position, they would be less likely to be dishonest if they knew a severe punishment would be certain to occur. Interestingly, scenarios that described the punishment as being swift to occur after the infraction did not affect their self-reported responses to the scenarios.

Remarkably little research exists on whether punishment would deter potentially dishonest scholars from engaging in a lack of research integrity. Yet universities and academic organizations almost all have policies recommending sanctions for scholars who have been found to be dishonest. Are such sanctions perceived as "severe"? Do arguably severe sanctions deter potentially dishonest scholars? Are university administrators prepared to enforce severe sanctions? Further empirical research and informed debate on the effectiveness of sanctions seems imperative.

CS28.3

Considering the implications of Dan Ariely's keynote speech at the 3rd World Conference on Research Integrity in Montréal

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The actions taken in response to academic misconduct result in development of policies, regulations, codes of conduct, the instruction in the responsible conduct of research, and oversight intended to ensure compliance. While these steps are necessary they might not be sufficient in ensuring responsible conduct of research. As such, strategies to protect research integrity which can be implemented in the specific contexts where the work of research takes place are needed. This emphasis on the research settings reflects on the fact that scientific enterprise is undertaken in an environment, as Grinnell (2009) observes, characterized by ambiguous and uncertain contexts that is susceptible to academic misconduct.

The traditional mechanisms intended to reduce academic misconduct are founded on the classical economics view of the human being as a "rational agent" being who engages in exhaustive cost benefit analysis when deciding whether to engage in dishonest act or not (Mazar & Ariely, 2006). In his book, *Predictably Irrational: The Hidden Forces That Shape Our Decisions*, Dan Ariely explains that dishonesty decision making process is not always driven by logical calculation with respect to benefits and losses (2008).

In empirical studies, Ariely found that the high likelihood of being caught did not deter subjects from refraining dishonesty (2008, p. 201). In the same studies, when the subjects were given an opportunity to destroy the incriminating evidence, the incidents of cheating did not decrease dramatically. This suggests that mechanisms that underpin acts of dishonest are beyond rational cost benefit analysis. Among these mechanisms are internal reward systems that influence dishonest behavior (Mazar & Ariely, 2006).

The presentation "Considering the Implications of Daniel Ariely's Keynote Speech Presented at the 3rd World Conference on Research Integrity in Montreal," proposes that theory and findings from behavioral economics may shed light on research integrity and misconduct. Behavioral Economics incorporates insights from psychology into the principles of economics in order to explain human "limitations" and the "complications" that follow from these limitations. (Mullainathan & Thaler, 2000). The presentation suggests ways in which strategies based on behavioral theory and research might be used by principal investigators to support research integrity among their research teams. Employing the concept of "choice architecture" where the default choice is the right choice, the suggested techniques have the potential to create an environment where likelihood of incidences of academic misconduct is reduced (Thaler & Sunstein, 2009).

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CS28.4

Two large surveys on psychologists' views on peer review and replication

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Research question

Because of major cases of misconduct, high error rates in reporting of results, and failed replications of seminal studies, psychological science has witnessed a broad debate on improvements in methods of analyzing and reporting results, peer review, and replication. We wanted to collate opinions of research psychologists on these issues.

Methods

We conducted two surveys of authors who had recently published in psychology, inviting 10,000 corresponding authors in each survey. We got useful responses from 2,304 and 1,931 respondents, in the two surveys, respectively. Questions in Survey 1 pertained to respondent's trust in the literature, assessments of the peer review system in psychology and frequency of common problems in peer review, and respondents' support for policies to improve the peer review system. Questions in Survey 2 were concerned with the value of replication, the interpretation and potential consequences of failures to replicate, the prevalence of Questionable Research Practices (QRPs) in the field, and respondents' support for policies to improve replicability of published results. Respondents in both surveys were also asked to indicate their psychological subfield and the number of peer-reviewed publications.

Results

Results of Survey 1 showed that most responding psychologists trust the psychological literature, but also have some doubts about reproducibility of results in it. Although the majority of respondents were generally satisfied with the peer review system, most indicated that it could be improved. Most common problems concerned cases in which field leaders and close colleagues of editors/reviewers were favored during peer review, and a lack of theoretical or statistical knowledge among reviewers. Solutions with most support were the use of double-blind review, regular screening for QRPs by journals, and the training and incentivizing of reviewers. Results of Survey 2 showed that most respondents agreed with the statement that the literature contains many non-replicable results, and that many psychologists used to employ QRPs. The majority of respondents valued direct replication, while acknowledging that failed replications could be due to moderators that are yet unknown or because materials may have different meanings across samples and contexts. A substantial subset of respondents indicated that failed replications might lead to accusations of fraud. Solutions with the most support among respondents included mandatory disclosure of data exclusions, the publication of data and stimuli, and the establishment of system to arbitrate accusations of misconduct.

Implications

These two surveys shed interesting light on contested issues about peer review and replication in psychological science. Responses highlighted general trust in the literature and general satisfaction with the peer review system, but also the acknowledgment of problems of nepotism and low quality reviews, as well as issues related to QRPs, and potentially low rates of replicability in the literature. Psychological researchers appear to favor double-blind review and would like to see peer review improved by training and incentivizing of peer reviewers. The need for direct replication of published findings is widely, albeit not unanimously, acknowledged.

29. Reporting and publication bias and how to overcome it

Chair: Diane Sullenberger, *Proceedings of the National Academy of Science (PNAS)*, US

CS29.1

Data sharing: Experience at two open-access general medical journals

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS29.1

Making de-identified patient data from clinical trials is an important step towards increasing scientific integrity and reducing wasteful practices

that undermine the evidence base for treatments and other health interventions. This is why many international bodies, including the U.S. Institute of Medicine, now agree that such data sharing should become the norm.

This oral presentation gave an overview of the scientific and ethical arguments for data sharing in medical research and considered the pros and cons of different data sharing models. It also looked at compliance with The BMJ's policy on data sharing for drug and medical devices trials, and at BMJ Open's initiative to help authors to share datasets in the Dryad digital repository.

CS29.2

Overcoming publication bias and selective reporting: completing the published record

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS29.2

The reproducibility and reliability of published research is increasingly coming into question, with concerns about publication bias and selective reporting leading to calls for increasing transparency around research data. The idea that 'negative,' non-confirmatory results are valuable and should be published is gaining increasing support, as evidenced by the widespread support for initiatives, such as AllTrials. The latest front is availability of data, with journal and funder policies becoming increasingly stringent.

This is a great step forward. Ensuring that the full data, regardless of outcome or significance of findings, are available allows readers to see if the analysis and conclusions drawn are accurate for that dataset. However, data sharing alone won't ensure reproducibility – even if your conclusions are supported by the data, in order to replicate your findings, the full, detailed methods need to be shared. The smallest variation in the methods could lead to huge differences in the results.

Most journals only offer a précis version of the methods used, with some journals persisting with word limits for their Methods section until very recently. This meant that authors often simply cited a previous paper where this technique was used, who cited a previous paper, which also cited a previous paper – and so the wild goose chase is on. Science is not static, so even if you do eventually track down the original article, the methodology will have evolved.

If we are to argue that there is a moral imperative for researchers to share the results of their research, we also need to argue that they must share their methods too. This is not new; journals like *Trials* have been calling for the publication of clinical trial protocols for almost 15 years and, more recently, journals have begun accepting protocols for other study types.

We need to apply the same standards and level of importance to study protocols that are eventually applied to the results. If we are to require publication of results and the full release of data, then we must also require full, detailed reports of the methodologies used to derive those data. These need to be published in advance of the full study, so that any changes or alterations have to be accounted for and rationalised, and linked in full to the data. This is the only way to facilitate reproducibility.

CS29.3

The EQUATOR Network: promoting responsible reporting of health research studies

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Complete, accurate and transparent reporting is an integral part of responsible research conduct. However, many studies document that most

health research publications lack crucial information. Adherence to reporting guidelines decreases honest reporting errors, helps to reveal poor methodology, and improves the reliability and usefulness of publications. Unfortunately, reporting guidelines uptake by journals and authors is still limited and far from their potential even when journals express interest in utilizing reporting guidelines and dissemination efforts are underway.

The EQUATOR (Enhancing the QUALity and Transparency Of health Research; www.equator-network.org) Network was set up in 2008 to improve the reliability and usability of health research literature by facilitating complete reporting of research studies. EQUATOR's most important output is the comprehensive online collection of resources that facilitates responsible publication of research (the EQUATOR Library for Health Research Reporting). EQUATOR supports the use of these resources through education and training events. The EQUATOR team collaborates closely with journals, reporting guideline developers, methodologists, educators and research funders. It is ideally placed to lead a global collaboration between the research and publishing communities aimed at the prevention of poor, unethical research reporting and widespread adoption of best reporting practices.

One of our key collaborative partners is the Pan American Health Organization (PAHO). In 2010 the EQUATOR and PAHO signed a memorandum of understanding supporting the PAHO Policy on Research for Health by raising standards in research reporting in Americas. Several key projects has been carried out under this agreement including provision of EQUATOR's key resources in Spanish, promotion of reporting guidelines, awareness raising and various capacity building events.

30. The research environment and its implications for integrity

Chair: Zoë Hammatt, Office of Research Integrity (ORI), US

CS30.1

Ranking of scientists: the Russian experience

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS30.1

Problem of ratings in science is one of the most topical. It is noteworthy that not only scientists, but also society relates closely to the different ratings - universities, institutes, scientists and scientific schools, scientific publications, etc.. It is not surprising top lists are the subject of keen criticism.

After the reform of the Russian Academy of Sciences a list of the leading Russian scientists in all fields on the basis of Russian Science Citation Index was created. Each scientist was assessed by three indicators: the total number of papers, number of citations and h-index. Discussion about this top sheet has revealed some of the most pressing problems:

- Rating does not take into account scientific awards and prizes
- Criteria for correlation criteria are problematic (Nobel laureate is in 20th place due to the smaller number of citations)
- It does not take into account the role of scientists in the formation of scientific schools and scientific fields
- Citation index may reflect both the scientific accomplishments and criticism.
- The problem is that the rating can provoke unfair competition in science. For example, journal editors use methods of tabloids. They print poorly proven results. This leads to a large number of negative comments and criticism that raises rating scientist and journal impact factor.

CS30.4

From cradle to grave: research integrity, research misconduct and cultural shifts

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:CS30.4

Dealing with a serious allegation of research misconduct is usually the beginning of a long journey for an institution to (1) establish fair and consistent processes to investigate allegations, (2) expand the application across different settings and situations, for example ethics and research safety compliance, and (3) implement a culture of responsible research that minimises the occurrence of research misconduct in the first place. This comes often after identifying significant flaws in dealing with allegations, such as having multiple inquiries with different outcomes, perceived conflicts of interest, perceived lack of transparency, lack of expertise of panel members, interference of enterprise agreement processes, and problems with the definition of breach versus research misconduct (Van Der Weyden 2004). At the same time it is also important to avoid over-regulating and overburdening researchers in a way that is disproportional to the problem (e.g. Salman et al. 2014). A functioning research environment, fostering a responsible research culture, should go some way to addressing recent concerns in the field of research integrity, i.e. research quality and lack of replicability (Begley and Ellis 2012, Grens 2015).

Lessons in implementing a system for research integrity can be taken from the scientific literature into social norm and norm violation. The Broken Windows Theory formally developed by Kelling and Wilson in 1982 has provided policy makers around the world with an ideological framework supporting a no-tolerance approach to crime and misdemeanour in general. Over time it has become apparent that the scientific evidence supporting a low tolerance towards crime (if that is what we want to call serious research misconduct) is not supported by empirical and experimental evidence. For instance, norm violation can be influenced by the sense of ownership, the signalling of social control, local codes of conduct, employment levels and local differences in social control (Gibson 2014). Experiments have identified local differences in economic fortunes, demography, drug laws and epidemics, differences in types of crime and the pool of potential criminals as influencing behaviour (Keuschnigg and Wolbring 2015). Indeed, low tolerance approaches may be effective to address one scale of the 'crime' (low order misdemeanour) but not the other end (serious crime) (Keuschnigg and Wolbring 2015). How does this evidence relate to frameworks trying to address prevention of both breaches and serious research misconduct?

The Australian Code for the Responsible Conduct of Research (2007) (the Code) was developed to lay out the principles of research practice to encourage the responsible conduct of research (Part A of the Code) and to provide a framework for resolving allegations of breaches of the Code and research misconduct (Part B). Research misconduct is defined as including not only fabrication, falsification and plagiarism but also failure to declare and manage serious conflicts of interest, avoidable failure to follow research proposals as approved by a research ethics committee and the wilful concealment or falsification of research misconduct by others. Breaches are less serious and, in particular, do not involve intent and deliberation, recklessness or gross and persistent negligence.

In keeping with Part A of the Code, the new research integrity framework at UNSW Australia celebrates the principles of responsible research practice and replaces the rigid rules-based terminology of 'must comply' with a statement of behaviours around the principles of responsible research practice that university staff and students are expected to follow. The eight principles are clear and simple and are arranged around 1) Honesty (reporting research findings with integrity), 2) Objectivity (unbiased analysis, disclosing conflicts of interest),

3) Confidentiality (proper curation of confidential material), 4) Accuracy (keep clear accurate records of data and materials), 4) Responsible Publication (responsible authorship and peer review), 5) Accountability and Openness (research methods and findings are shared openly and discussed professionally), 6) Respect for Intellectual Property (proper credit where credit is due), 7) Mentoring (responsible development of research trainees), 8) Ethics (responsible and ethical research with animals or humans), and 8) Research Safety (a safe working environment). These principles were also developed to align with the Singapore Statement on Research Integrity (2010) to fit within a world with increased international research collaboration.

Spreading the message of the principles of responsible research practice across the university involves several broad strategies, all aimed at emphasising the positive aspects of research integrity. UNSW Research Integrity Advisors are seen as the champions of promoting the responsible conduct of research, thus broadening the definition of this role in the Code from an advisor to persons seeking information on how to report allegations of research misconduct. Face to face workshops by demand complement online research integrity training for higher degree by research students. Our animal ethics has a history of face to face seminars and workshops for new researchers as well as regular refresher courses for senior research staff. We interact with universities across Australia, its Group of Eight and the Australasian Research Management Society to host fora so that research practice is promoted across institutions and not just in an insular fashion.

All complaints and allegations of breaches and research misconduct are dealt with centrally and uniformly through the Office of the Deputy Vice-Chancellor (Research) and referred for formal investigation where a prima facie case of research misconduct has been established. Referrals to the Office of the Deputy Vice-Chancellor (Research) extend beyond Part A of the Australian Code and cover allegations received, or noted, by the university's research ethics committees, failure to obtain permits from federal or State authorities, unauthorised use of genetically modified organisms, and alleged non-compliance with research safety and radiation requirements. This pathway of 'notifiable events' avoids many of the potential conflicts of interest that may arise when committee chairs or heads of school are involved in dealing with complaints and allegations. Importantly, it also ensures that a consistent approach can be applied to all allegations of research breaches and research misconduct and that all parties receive a fair and just treatment.

Considering the literature on social norms and norm violation and our experience during the implementation of research integrity frameworks some questions for future initiatives are Q1: If research quality can be seen as a reward for good behaviour then it can be used as the main driver for cultural shifts: do we need research to find out?, Q2: Zero tolerance may not always be effective, especially against serious research misconduct: what is the right balance between compliance, awareness training and self-regulation?, and Q3: Research into the Broken Windows Theory shows that many factors can influence the level of misdemeanour: are there equivalent factors in the research environment?

Acknowledgement

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PARTNER SYMPOSIA

Partner Symposium A

Organized by EQUATOR Network, Enhancing the Quality and Transparency of Health Research

Making the research publication process more efficient and responsible: Practical ways to improve the reliability and usability of published (health) research

Chairs: Iveta Simera, University of Oxford, UK; Trish Groves, BMJ, UK

P1

Can we trust the medical research literature?: Poor reporting and its consequences

Iveta Simera

University of Oxford, Oxford, UK

Research Integrity and Peer Review 2016, **1(Suppl 1):P1**

Scientific publications are the most important means for sharing new research findings amongst scientists and clinicians. These professional communications substantially influence the use of new findings in further research and clinical practice. They also have a profound impact on how scientific findings are interpreted by media and public. However, growing evidence demonstrates widespread deficiencies in publications of health research studies. Serious problems include (but are not limited to): non-reporting or delayed reporting of whole studies; omission of crucial information in the description of research methods and interventions; discrepancies between protocols and published articles; selective reporting of only some outcomes; inadequate reporting of harms; presenting data and graphs in confusing and misleading ways; and omissions from or misinterpretation of results in abstracts.

Such deficiencies in reporting make it difficult or impossible to assess how the research was conducted, to evaluate the reliability of the presented findings, to place them in the context of existing research evidence, and to translate best evidence to best practice. As a result published studies often cannot be used by clinicians in patients' care or to inform public health policy. A considerable amount of the huge sums of money invested in health research is therefore wasted.

The current situation is unacceptable and requires co-ordinated action. Although ultimate responsibility for the design, conduct and accurate publication of studies lies with the researchers, a coordinated effort of all parties involved in (health) research and its publication is urgently needed to remedy the current unsustainable situation.

P2

What can BioMed Central do to improve published research?

Daniel Shanahan, Stephanie Harriman

BioMed Central, London, UK

Research Integrity and Peer Review 2016, **1(Suppl 1):P2**

Research articles only have value if the hypothesis is relevant, the methods are valid and the findings are published in a usable form. However, 'good' results – those considered interesting or impactful – are often considered synonymous with quality. This has led to huge problems with the reproducibility and reliability of the literature, including issues such as publication bias, selective reporting and significance chasing.

To correct this situation, we need to change the way we consider and evaluate science, moving towards prospectively evaluating research based on the question it asks and the processes used, rather than the outcome observed.

BioMed Central is involved with a number of initiatives to help change this focus. These include supporting established methods, such as trial registration and acceptance of null and non-confirmatory results, as well as spearheading the prospective publication of study protocols and statistical analysis plans – publishing full, detailed methodology for both randomised controlled trials and systematic reviews, in advance of the study conduct. These can then be updated to reflect any changes that occur before unblinding of the outcome data.

Readers need access to all the information if they are to reliably evaluate bias or selective reporting in a study. Therefore, we mandate use of established reporting guidelines both on submission and as part of the peer review process, and are involved in the development of new guidelines. We also drive the Threaded Publications initiative, which will link all publications relating to a single research study, so that they are clearly identifiable and accessible.

Readers must be able to trust the content of the journals. Underpinning this is publication ethics. An editor's responsibility to the literature does not stop at the point of publication and must correct the literature if errors are identified after publication.

Like many publishers, BioMed Central and all of its journals are members of the Committee on Publication Ethics (COPE), an organisation that provides resources and advice to editors.

Where errors are identified in a published article, editors may need to correct or retract. Published articles cannot be simply 'deleted' and instead editors follow COPE guidelines and publish a retraction article that is clearly and permanently linked to the original article. This provides a transparent mechanism to correct the literature.

To maintain high standards in publication ethics, BioMed Central also provides support and training for those involved in the publication process such as editors and peer reviewers.

P3

What can a "traditional" journal do to improve published research?

Trish Groves

BMJ, London, UK

Research Integrity and Peer Review 2016, **1(Suppl 1)**:P3

The BMJ is an international general medical journal that aims to improve published research through: providing education for researchers; developing and implementing better editorial policies and peer review processes; and advocacy and campaigning.

Ongoing educational initiatives at The BMJ include publishing Research Methods and Reporting articles and series; an international programme of editorial outreach and teaching; and, from late 2015, an in-depth eLearning programme for early career health researchers called Research to Publication.

Meanwhile, the journal continues to develop detailed resources for authors focusing on ethical transparency, scientific transparency, and open peer review. And, building on a journalistic tradition lasting since the journal's launch in 1840, The BMJ actively advocates and campaigns for integrity in all aspects of medical research. Currently, The BMJ is calling for open science, supporting the Restoring Invisible and Abandoned Trials (RIAT) international initiative, and is an active member of the AllTrials campaign that aims to get all clinical trials registered and all results reported.

P4

Promoting good reporting practice for reliable and usable research papers: EQUATOR Network, reporting guidelines and other initiatives

Caroline Struthers

University of Oxford, Oxford, UK

Research Integrity and Peer Review 2016, **1(Suppl 1)**:P4

There are many international initiatives, including the EQUATOR Network, which have responded to deficiencies in the research literature and aim to help anyone involved in research to improve its relevance to patients, how it is conducted, and how it is reported. People who conduct and report clinical research well often explicitly acknowledge the role of the EQUATOR Network and Reporting Guidelines in improving the impact of their own research.

The EQUATOR Network was launched in 2008 with the primary goal of improving the reliability and value of the medical research literature by ensuring medical research is reported accurately, completely, and transparently. CONSORT, the first and most well-known Reporting Guideline for randomized trials has had a major impact, but more needs to be done to increase awareness of and adherence to Reporting Guidelines for the many other healthcare related study designs, such as observational and diagnostic studies. The EQUATOR Network website provides a searchable database of Reporting Guidelines and extensions, now numbering nearly 300, covering many different study designs, clinical areas, and sections of reports.

A main focus of EQUATOR over the next few years is to develop educational resources, courses and tools which will embed the use of Reporting Guidelines into the research process at every stage. We are developing workshops and courses for editors and researchers, freely accessible eLearning materials designed to reach researchers in lower resourced countries, and user-friendly tools to make it easier to use Reporting Guidelines as part of the routine of reporting and publishing research articles.

In 2016 we will launch an exciting new EQUATOR campaign called "GoodReports" initially targeting journal editors and peer reviewers to encourage and ease the implementation of reporting guidelines into existing editorial systems on a much wider scale and increase the positive impact of EQUATOR resources on the biomedical research literature.

Partner Symposium C

Organized by ENRIO, the European Network of Research Integrity Officers

Chair: Nicole Foeger, Austrian Agency for Research Integrity, Austria

P5

Transparency and independence in research integrity investigations in Europe

Krista Varantola¹, Helga Nolte², Ursa Opara³, Torkild Vinther⁴, Elizabeth Wager⁵, Thomas Nørgaard⁶

¹Finnish Advisory Board on Research Integrity, Helsinki, Finland;

²University of Hamburg, Hamburg, Germany; ³Committee for Women in Science, Ljubljana, Slovenia; ⁴National Committees for Research Ethics,

Oslo, Norway; ⁵UK Research Integrity Office, Brighton, UK; ⁶Danish

Committees on Scientific Dishonesty, Copenhagen, Denmark

Research Integrity and Peer Review 2016, **1(Suppl 1)**:P5

Various European countries developed different systems to handle alleged cases of research misconduct. In the ENRIO partner symposium Krista Varantola (Finland), Torkild Vinther (Norway), Thomas Nørgaard (Denmark), Ursa Opara and Renata Šribar (both Slovenia), Liz Wager (UK) and Helga Nolte (Germany) discussed e.g. the following issues:

Self-regulation and the role of sanctioning

Self-regulation has to be practiced. Several European countries (see also www.enrio.eu) already established national offices on research integrity. For several reasons self-regulation on the local level does not always work and it is advisable to have an oversight body. Some national commissions have a legal mandate (Denmark, Norway and Poland), other countries established national advisory boards. Some small countries decided to have international experts in their board to guarantee more independence (e.g. Austria; but also planned in Slovenia and Luxembourg). This might be especially helpful if a decision maker (e.g. minister or rector) is accused. What's about sanctioning – especially in "grey area practices"? Sometimes a young researcher immediately lost his/her job while a senior scientist got off with a slap on the wrist. Harmonization of sanctions is definitely needed.

Whistleblowing

Whistleblowers are the main resource for inquiries. For young researchers the threshold to inform the research institution about alleged research misconduct is too high. Several Codes of Conduct include a specific clause on the protection of whistleblowers. What's about anonymous whistle blowers? The Danish Committees on Scientific Dishonesty cannot follow up an anonymous complaint due to their legal system (protection of the accused person) and their legal tradition (right to know who the complainant is). In other countries anonymous complaints can be handled as long as there is sufficient information about the accusation.

Transparency

Numerous national research integrity offices publish annual reviews with summaries on investigated cases of research misconduct. In these reports names of accused persons or involved institutions are usually not mentioned. However, in Scandinavian countries, according to law, names have to be revealed if anyone requests so.

What's about transparency at the local level? In UK the "Concordate to Support Research Integrity" calls on universities to publish annual summaries of formal investigations but a survey showed that most universities did not do so (Nature, 2015 May 21;521(7552)).

Partner Symposium D

Organized by IEEE, the Institute of Electrical and Electronics Engineers

Re-educating our author community: IEEE's approach to bibliometric manipulation, plagiarism, and other inappropriate practices
Chair: Gordon MacPherson, IEEE, US

P6

Dealing with plagiarism in the connected world: An Institute of Electrical and Electronics Engineers (IEEE) perspective

Jon Rokne

University of Calgary, Calgary, Canada

Research Integrity and Peer Review 2016, 1(Suppl 1):P6

This paper considered plagiarism as it has evolved following the advent of the Internet and what IEEE is doing to handle plagiarism issues. The Internet and electronic publishing has spawned two trends;

1. The ease by which electronic documents can be replicated and plagiarized.
2. The ability to compare a given document against a data bases of previously published material.

In this talk plagiarism was first discussed in general terms and some examples are given. The talk then compared notions of plagiarisms across scientific disciplines and provided a summary on how plagiarisms are handled by the different disciplines.

The talk then integrated the two aforementioned new developments into a discussion of plagiarisms and showed how IEEE is dealing with plagiarisms. Details of the Publications Services and Products Board Operations Manual that are relevant to the handling of plagiarisms were summarized. The talk concluded with some observations and suggestions for how to handle plagiarisms in the future.

P7

Should evaluation of raises, promotion, and research proposals be tied to bibliometric indicators? What the Institute of Electrical and Electronics Engineers (IEEE) is doing to answer this question

Gianluca Setti

University of Ferrara and University of Bologna, Bologna, Italy

Research Integrity and Peer Review 2016, 1(Suppl 1):P7

The intention of this paper is to demonstrate that the quality of a journal as measured by journal bibliometric indicators is a multidimensional concept which cannot be captured by any single indicator. Bibliometric indicators should not be misused by giving them more significance than they deserve, noting that 1.) the impact of an individual paper cannot be measured by the impact of the journal in which it has appeared; 2) there is no

strong correlation between the Impact Factor of a journal and its selectivity (rejection rate), and 3) the Impact Factor of a journal is not a good proxy for the probability that an individual paper will be highly cited.

In conclusion: the misuse of journal bibliometric indicators has undesired consequences. The same is happening also for citation based analysis (and its derivatives like the h-index).

P8

Recommended practices to ensure conference content quality

Gordon MacPherson

IEEE, Washington, USA

Research Integrity and Peer Review 2016, 1(Suppl 1):P8

This paper evolved from discussions among Elsevier, IEEE, and IET about safeguarding IEEE's technical conference proceedings from out-of-scope and/or poorly written papers, and is intended to put forth guidelines to setting up proper safeguards.

The document features a glossary of terms commonly used in the context of a discussion about technical conference content; a set of proposed guiding principles; a discussion of the rights and obligations of authors, organizers, and others involved in the development of the conference's technical program; statements about deceptive practices such as plagiarism or the submitting of machine-generated papers; suggested peer review workflows; and concludes with organization-specific appendices, including discussions of subject matter scope.

My goal is to continue to socialize this paper as a "living document" within the STEM publishing community, to seek comments and feedback, and to integrate additional best practices and appendices from other scholarly publishers and professional associations.

Partner Symposium E

Organized by the Committee on Freedom and Responsibility in the Conduct of Science of ICSU, the International Council for Science

Research assessment and quality in science: perspectives from international science and policy organisations

Chair: Merry Bullock¹, Roger Pfister²

¹American Psychological Association, US; ²ICSU, France

P9

Challenges for science and the problems of assessing research

Ellen Hazelkorn

Dublin Institute of Technology, Dublin, Ireland

Research Integrity and Peer Review 2016, 1(Suppl 1):P9

Globalisation has transformed the role and importance of university-based research as a driver of knowledge intensive growth. The depth of the global economic crisis, and the pivotal role played by higher education as an "engine of the economy" has led to concerted efforts to effectively harness higher education to the wagon of economic recovery and growth. At the same time, the increasing prominence of global university rankings has had a revolutionising impact on higher education. While science has always operated in an international and competitive environment, rankings have catapulted higher education to the top of the policy agenda and prioritised university-based research arguably undermining the traditional teaching-research nexus. Correspondingly, assessment of publicly funded research is part of a growing trend for greater transparency, accountability and responsibility, with implications for research practice and organisation – and the wider innovation eco-system.

These developments are posing a significant challenge for research, leading to considerable rebalancing in the role of research within higher education and society. In some instances the pressures are contradictory; for example, public pressure is requiring research to have a greater and public and social accountability while rankings tend to emphasise academic accountability via peer review. Overall, there is a discernible tension in science policy between research as being vital for human capital development vs. its contribution to economic development; between an emphasis on researcher curiosity vs. alignment with national priorities; between funding excellence wherever it exists vs. targeting funding to strengthen capability or build scale; and between encouraging new and emerging fields and

higher education institutions vs. prioritising existing strengths. These developments are also challenging the way in which research is measured and assessed. Research assessment can play an important role in improving performance and quality, supporting institutional autonomy and strategic planning, differentiating research missions and attracting talent. Many countries have or are in the process of introducing research evaluation processes. Depending upon jurisdiction, concepts of valorisation, impact and relevance now form an important component of the research/science policy discourse, displacing or replacing traditional language around intellectual curiosity, and cultural and political independence from economic forces. This presentation will review changes in the global landscape of higher education and research, and explore the implications of these changes for research and researchers. As public funding for research declines and international competition accelerates, what are the consequences for research integrity?

P10

Research assessment and science policy development

Carthage Smith

Global Science Forum at the Organisation for Economic Cooperation and Development OECD, Paris, France

Research Integrity and Peer Review 2016, 1(Suppl 1):P10

Research assessment and the use of quantitative measures, such as bibliometrics, are increasingly being blamed for various malaises in our research systems, including an increase in the prevalence of research misconduct (falsification, fraud and plagiarism). The reality is that there is a lot of hearsay and anecdote when it comes to asserting the distorting effects of bibliometrics on the research enterprise and there is a shortage of real empirical evidence. Likewise the adulatory terms in which many senior scientists speak of peer review as the 'Gold Standard' for research evaluation have little empirical basis. Both quantitative metrics and subjective peer analyses have their advantages and drawbacks and both have impacts on the way scientists and science systems function. But we do not fully understand what these impacts are and what an appropriate balance between different assessment approaches might be in different situations with different objectives.

OECD is a major provider of data and analysis to inform science and innovation policies in many countries. This includes measures of public and private investment in science that can be broken down across disciplines and sectors. It also includes key output measures for basic and applied research, including training and education. Bibliometric measures are increasingly used to get an insight into both the quantity and quality research production at the national level and also to explore issues such as international collaboration and researcher mobility. This data is used to benchmark the performance of different countries and assess their development over time. There is increasing policy demand for micro-analysis using bibliometric data at the sub-national or institutional level.

The use of bibliometric measures is an important part of science policy analysis. Used carefully such measures can provide valuable information about how scientists are publishing but they are certainly imperfect measures and, when disproportionate value is attached to them and/or they are used naively they may indeed have negative impacts. The measurement of science should not dictate how it is performed but rather desired performance should dictate what needs to be measured. Hence the question for us all might be what do we consider to be optimal scientific performance (for an individual, an institution or a country)? – I suspect that publication outputs in one form or another will be a critical element of the answer for most of us.

P11

Research integrity in South Africa: the value of procedures and processes to global positioning

Robert H. McLaughlin

University of Cape Town, Cape Town, South Africa

Research Integrity and Peer Review 2016, 1(Suppl 1):P11

The intensity of research activity in South African universities together with the pursuit of non-traditional sources of funding has elevated the need for institutional programming and support of responsible conduct of research in South Africa. The challenge to do so is at least two-fold: 1) global positioning as a matter of rank and prestige depends on research outputs and research ethics commensurate with the standards of leading institutions in "the North"; and 2) global positioning as a peer institution with collaborative scientists and scholars prepared to work in multi-sited, multi-institutional, and multi-disciplinary research depends on common standards and administrative consistency, including increased transparency with research sponsors. South African institutions thus confront authorship, financial and other conflicts of interest, human subjects protection, and animal research ethics with a unique perspective, local procedures and processes. And we ask: Is an African research agenda possible, and what are the contours of ethics and responsible conduct that shape it?

P12

Rewards, careers and integrity: perspectives of young scientists from around the world

Tatiana Duque Martins

Federal University of Goiás, Jataí, Brazil

Research Integrity and Peer Review 2016, 1(Suppl 1):P12

Why is integrity not a core criterion in assessment procedures? Given that reward incentives drive behaviour, should that not be the case? Where is the problem? Apparently, the lack of integrity is a criterion; scientific fraud is not being accepted. It might come across as puzzling that scientists behave fraudulently, despite this being diametrically opposed to fundamental scientific principles. But if we tolerate some small degree of dishonesty, such an outcome is not at all surprising. Reward systems based on quantity (e.g. bibliometrics), rather than quality, are not suited to reveal integrity issues, and to the contrary, with the exerted pressure, can even foster bad practice. Scientists should be appropriately rewarded for their work, a lack of reward results in poor commitment. With science being a global enterprise, poor reward systems can fuel brain drain. Integrity is part of the quality of scientific work, and should be seen as a *conditio sine qua non*. With this being strictly applied, integrity becomes disqualified as a reward criterion due to lack of differentiation. We however need to scrutinise scientific outputs for integrity. Reviewers of journal articles are to answer the question whether authors have provided sufficient detail for enabling their findings to be reproduced. Integrity goes hand in hand with openness, transparency, and scientific discourse. Young scientists must not be pressured into compromising on integrity for seeing their careers flourishing or led to believe that they better should.

Partner Symposium F

Organized by the Online Resource Center for Ethics Education in Engineering and Science / Center for Engineering, Ethics, and Society of the National Academy of Engineering

Chairs: Thomas M. Powers¹, Mark S. Frankel²

¹University of Delaware, US; ²American Association for the Advancement of Science, US

P13

Research misconduct: conceptions and policy solutions

Tetsuya Tanimoto¹, Nicholas Steneck², Daniele Fanelli³, Ragnvald Kalleberg⁴, Tajammul Hussein⁵

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Research Integrity and Peer Review 2016, 1(Suppl 1):P13

The issues this talk addressed was whether having many [ethical] standards may hinder science and fail to best serve society and, if so, what might be the prospects for a uniform set of standards. Several distinguished scientists

contend that the variation in the norms and standards governing the work of scientists in different countries should be harmonized to advance effective and ethical collaboration in international research. Yet, such claims have not been accompanied by sufficient evidence that research has been hindered or that there is even a solid understanding of the nature and scope of the problem. In the absence of such evidence, it is premature to move toward a set of global standards.

If such a problem could be demonstrated, however, what challenges lie ahead in developing, adopting and implementing uniform global standards? Several were noted: (1) Whether to aim for minimally acceptable standards more likely to be adopted internationally, or work toward more comprehensive standards that might be less likely to achieve consensus; (2) Deciding on the level of participation in the process and what procedures are used to make decisions; (3) Determining what critical mass of countries is needed to be successful, taking into account social, economic, cultural, and political diversity among countries and their capacities for research and development; and (4) Calculate what countries perceive they will be getting in return for whatever investment they are asked to make, and the trade-offs countries will, or should, be expected to make.

Since international standards must ultimately be interpreted, understood, implemented and adhered to in the context of "local" policies and law, an implementation process should: (1) Be consistent with the goals of the standards; (2) Be efficient and effective; that is, do what they are supposed to do; (3) State requirements clearly and transparently; (4) Employ sanctions for violations that are applied fairly and sufficiently enforceable to promote accountability; and (5) Inspire respect and confidence among those affected and earn general public support.

Finally, no oversight system will be foolproof. Some will ignore the standards and others will exploit loopholes. Those responsible for implementing oversight are fallible, so some violators will elude justice. The key is to be prepared in advance for what the response will be to such shortcomings.

Partner Symposium H

Organized by ORI, the Office of Research Integrity; Universitas 21; and the Asia Pacific Research Integrity Network

Chairs: Paul Taylor, University of Melbourne, Australia; Zoë Hammatt, U.S. Office of Research Integrity, US

P14

International integrity networks: working together to ensure research integrity

Ping Sun¹, Ovid Tzeng², Krista Varantola³, Susan Zimmerman⁴

¹Institute of Scientific and Technical Information of China, Beijing, China;

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Research Integrity and Peer Review 2016, 1(Suppl 1):P14

The U.S. Office of Research Integrity and Universitas 21 joined efforts to organize this partner symposium designed to inspire increased collaboration among and across integrity networks around the world. Participants heard from representatives of Universitas 21, the newly established Asia Pacific Research Integrity (APRI) Network, the European Network of Research Integrity Offices, and the Canadian Secretariat on Responsible Conduct of Research. The U.S. Association of Research Integrity Officers was also described as a group of nearly 400 Research Integrity Officers in the U.S. with potential for collaboration with other networks. The Netherlands Research Integrity Network, whose representatives also presented at the 4th WCRI, was mentioned as forging new paths in this area. Attendees were encouraged to join networks as a means of sharing experiences and expertise in research integrity, and the discussion led to proposals to initiate networks in regions with little or no infrastructure for research integrity, including Africa and Latin America. The Symposium Chairs are collaborating to identify mechanisms for supporting interaction and resource sharing among and across international networks.

Partner Symposium I

Organized by COPE, the Committee on Publication Ethics

Publication without borders: Ethical challenges in a globalized world

Chair: Charlotte Haug, Committee on Publication Ethics (COPE), Norway

P15

Authorship: credit and responsibility, including issues in large and interdisciplinary studies

Rosemary Shinkai

Pontifical Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, Brazil

Research Integrity and Peer Review 2016, 1(Suppl 1):P15

Authorship-related disputes are increasing problems faced by academics and editors worldwide. Specific issues in large, collaborative, international, multi-site, and/or interdisciplinary studies may raise controversies in authorship. This presentation aimed at discussing authorship and contributorship in scientific production regarding credit and responsibility from study design to scholarly publishing.

Critical reflection is brought to public discussion on mega-authored papers with thousands of listed authors with very specific contribution roles. Some of these papers have been criticized because of multiple authors with unclear contribution to the study. However, a consensual understanding of the limits of authorship is still lacking. Some recent initiatives to set authorship parameters include an open discussion document by COPE on 'What constitutes authorship' and an ongoing work to establish a new taxonomy of authorship. Also, citizen science and public participant in scientific research have changed the traditional view of authorship based on the roles of the persons involved in the study project, data collection, and manuscript development.

Partner Symposium J

Organized by CITI, the Cooperative Institutional Training Initiative

Experiences on research integrity educational programs in Colombia, Costa Rica and Peru

Chair: Sergio Litewka

P16

Experiences in Peru

Roxana Lescano

Pontificia Universidad Catolica del Peru, Lima, Peru

Research Integrity and Peer Review 2016, 1(Suppl 1):P16

Several efforts ongoing in Peru are aimed at identifying and addressing responsible conduct of research issues and training in Peru.

Through a NIH- Fogarty grant structured surveys on responsible conduct of research have been distributed to university officials, and related focus groups have been conducted with students. Since June 2014, interviews on mentoring have been conducted with senior researchers and an online course and several live teaching sessions have been available to students and faculty researchers.

A pre- and post-course test that measured the impact of the live course among 35 attendees showed statistically significant improvements in the answers to questions regarding Plagiarism, Conflict of Interest, and Publications. After the course, over 40 % of the attendees provided correct answers regarding proper identification of scientific misconduct and plagiarism.

Cases of misconduct have been detected and adjudicated in one Master's Program. Other dissemination activities for RCR education in Peru have included training programs by the Naval Medical Research Unit and sessions at annual professional meetings.

P17

Experiences in Costa Rica

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Research Integrity and Peer Review 2016, 1(Suppl 1):P17

In Costa Rica, controversies and concerns about ethics and the regulation of clinical trials overshadow attention to research misconduct outside financial fraud and plagiarism. There is a limited sense of the scope of research integrity/ RCR apart from the ethics of clinical trials. Popular views of research misconduct include a wide range of activities, not necessarily related to what is understood as scientific misconduct internationally. Little is known about the state of research integrity, or rates of questionable practice, and there is a general lack of formal policies for handling allegations of research misconduct or independent bodies authorized to investigate allegations of research misconduct. Research ethics education in the health sciences focuses primarily on the protection of human participants in research.

The University of Costa Rica's (UCR), the country's leading research university, has established policies that address the reporting of suspected misconduct in any field of research. UCR's Resolution #VI-2734-2015 incorporates a translated and cited version of the US ORI's definition of misconduct (fabrication, falsification, or plagiarism in proposing, conducting, reviewing, or reporting research results). National Law 6683 de Derecho de Autor y Derechos Conexos ("Authors' Rights and Related Rights") defines acceptable use of others' texts.

P18

Experiences in Colombia

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Research Integrity and Peer Review 2016, 1(Suppl 1):P18

During the preparation of a National Dialogue about Research Ethics, carried out in October 2013, a previous questionnaire to participants identified several concerns among Colombian investigators and academics.

Some of the areas of concerns found included:

Undervaluation of the relevance of research integrity, undeclared conflicts of interests, and perceptions about problems related to funding allocation, such as not recognizing the real total time spent by researchers on a given project, and funding agency interference or mismanagement in funding allocation.

On topics related to research integrity policies, there was a lack of awareness about existing policies and also few research integrity courses available.

Finally, the perception among researchers and academics was that there is a lack of awareness about the relevance of RCR policies. Many institutions do not have policies at all, there is weak or nonexistent monitoring of misconduct, and there is no systematization in responding to challenges to research integrity.

Poster Session B: Education, training, promotion and policy

Chair: Jane Jacobs, Queensland University of Technology, Australia
King Saud University, Riyadh, Saudi Arabia

PT.01

The missing role of journal editors in promoting responsible research

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To maintain responsible research, the entire research system has to work synchronously to achieve this goal. Journal Editors work hard to make sure that they publish only sound research by subjecting the manuscript to rigorous review process; however, some of their practices may negatively affect research integrity. This abstract aims to explore such practices and suggest additional actions that journals' editors may take to further contribute in promoting responsible research. It is suggested that journals' editors adapt the following suggestions:

1. Declare all financial income and expenditure of the journal on an annual bases, including money from advertisement and companies.
2. Report all submissions and decisions taken sorted by topics, countries of authors, ...etc.
3. Share (or publish) data about plagiarism discovered before publication.
4. Adhere to a predefined manuscript review time frame and publish reports on compliance with that.
5. Publish reports of changes in the journal's decision on submitted manuscripts.

Although some of these suggestions may look simple and reasonable, however, some are certainly not and their implementation needs further discussion to avoid any ethical or legal violation. The spirit of this abstract lies in the fact that transparency in research should involve all the research cycle, including journals and publishing bodies.

PT.02

Honorary authorship in Taiwan: why and who should be in charge?

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Research Integrity and Peer Review 2016, 1(Suppl 1):PT.02

In July 2014, SAGE Publications retracted 60 academic work published in the Journal of Vibration and Control because of an alleged fraud of "peer review and citation ring" involving a professor in Taiwan. While Taiwanese academics confusedly asked why and how it happened, a related issue was widely discussed in public—whether the co-authors of these retracted articles should be jointly responsible for the misconduct. The scandal finally caused the resignation of the Minister of Education of Taiwan who claimed himself innocent but was listed as a co-author of at least five of the retracted work.

In general, the case has not only highlighted researchers' pressures of academic publishing, but also revealed the potential misuses of authorship (i.e., honorary authorship) in the academia of Taiwan. Therefore, several questions motivate the current study such as: Is the phenomenon of honorary authorship serious or popular in the academia? What are the possible scientific reasons behind and reactions toward the dishonesty of authorship in Taiwan? How to prevent this kind of misconduct in the future? What attitudes do Taiwanese researchers hold toward the scandal?

Methods:

This study uses survey method and develops a 65-item questionnaire to answer the research questions. The questionnaire consists of four sections mainly. The first section explores why honorary authorship happens in Taiwan (e.g., any believed "benefits" for Ph.D. students, professors and research fellows, research institutes, and the academia of Taiwan as a whole). The second section investigates who should be in charge of handling such research misconduct in Taiwan (e.g., government ministries, academic/research institutes, and/or professional communities). The third section explores what institutional actions do Taiwanese researchers prefer to take in order to minimize research misconduct in Taiwan (e.g., research ethics training, academic policy modification). The last section collects respondents' attitudes toward the scandal (e.g., single case vs. popular practice, serious vs. not-a-big-deal). The survey uses 5-point Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree" to gather respondents' opinions in each item. Snowball and purposive sampling are conducted to collect research data.

The participants of the survey are professors, research fellows, post-doctoral researchers, research assistant, and Ph.D. students from more than 30 academies in Taiwan. Around 400 valid samples are collected and the data collection still continues. The preliminary

results and discussion of data analysis were presented in the poster session of the 2015 World Conference on Research Integrity.

PT.03

Authorship and citation manipulation in academic research

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.03**

Research question:

Is it common for scholars to add authors to manuscripts or grants when those authors contribute almost nothing to the research effort? Similarly, do authors add citations either to impress reviewers or in response to coercion by editors? We study the use of such tactics across the academic universe.

Data and methods:

At the heart of this study lies a game-theoretic model that incorporates the benefits and the costs of engaging in authorship and/or citation manipulation as well as the strategic nature of that decision. This model generates several testable hypotheses about the reasons for manipulation, who is more likely to engage in the practice (e.g., certain disciplines, academic ranks, etc.), and the uneven effects on disciplines (e.g., some disciplines focus on grants, while others focus on manuscripts). We then generate a series of survey questions to measure the existence and extent of these practices. Four waves of surveys were distributed in the last four years, 2011 – 2014 and in total this yielded more than 11,000 responses on manipulation. Our respondents span much of the academic universe: medicine, nursing, biology, chemistry, computer science, mathematics, physics, engineering, ecology, accounting, economics, finance, marketing, management, information systems, sociology, psychology, and political science. Their responses reflect on their personal experience and practice in five types of manipulation: adding gratuitous authors to manuscripts, adding gratuitous authors to grants, adding gratuitous citations to manuscripts, adding gratuitous citations to grants, and coercive citations.

Results:

While the overwhelming majority of scholars disapprove of manipulation, the actual practice is ubiquitous. Results show gratuitous authorship in manuscripts and grants, gratuitous citation in manuscripts and grants, and coercive citation, in every single discipline; however, there is substantial variation across fields, across academic rank, and by journal. For example, junior faculty members, and especially those who do not have tenure are more likely to be engaged in manipulation either as a perpetrator (adding authors and citations) or as a victim (being coerced). Manipulation on grant proposals is more prevalent in those disciplines that rely heavily on external funding (e.g., medicine and engineering) and scholars with more experience are more likely to be engaged, *ceteris paribus*. Of course manipulators have their reasons, some say they are coerced, and some feel disadvantaged if they do not manipulate, others say they are just trying to help out a colleague or pay respect to their mentor. But the explanation most frequently given as to why scholars add gratuitous authors to grant proposals is that they think the individual's reputation will increase their chances of getting a favorable review. This raises serious ethical questions.

Implications:

We find strong evidence of persistent, pervasive, and purposeful manipulation by scholars and editors. This leads to the potential misallocation of research funds, inappropriate attribution of research findings, and a clouded picture of how a particular research finding emerged. None of this serves the interest of scientific progress and thus a similarly persistent counter-strategy needs to be constructed that can offset the strong incentives that currently exist to engage in manipulation.

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PT.04

Open peer review of research submission at medical journals: experience at BMJ Open and The BMJ

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.04**

The BMJ (<http://www.bmj.com/theBMJ>) is an international general medical journal that publishes all research with open access. During 2015 The BMJ started publishing each research article with a detailed pre-publication history to show what happened during open peer review.

All reviewers sign their review and are aware that - if the article is eventually accepted - their reviews will be published alongside for all to read. Open peer review brings both credit and accountability to reviewers, who have to declare their competing interests openly and may have to defend their comments.

The BMJ's open peer review policy draws on evidence from two randomised controlled trials of open peer review, and also from experience of mandatory open peer review for more than 3000 published papers at a sister journal BMJ Open (<http://bmjopen.bmj.com/>).

PT.05

Exercising authorship: claiming rewards, practicing integrity

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.05**

"Careers are judged based on the sheer number of papers someone has published, and on how many times these are cited in later papers – though this is a hotly debated measure of scientific quality" (World Science, 04/24/2010, at http://www.world-science.net/othernews/100424_publish). Impact of scientific publication over personal development and academic reputation is essentially discursively constructed and the pressure to publish. Is felt by Brazilian university faculty and students, since financial support is allocated in programs depending on their publication index. Increase in the rhythm of publication comes with a great amount of difficulty and stress for accommodating the generation of original ideas and reading and writing practices in a reduced slot of time. Additional challenge lies in defining and giving credit to authorship. In this presentation, first authorship is conceptually defined and then data collected with written questionnaires in two highly considered research groups in a Southern Brazilian university are presented. The data is still under analysis for both groups' discursive representations about effective publication practices (what writing means to them, how writing and publishing are conducted in each group, how productive the practice is perceived to be, publication best practices, how professors and students define, teach, encourage, exert and give credit to each other's authorship). Previous results from the social/human science group show that authorship is perceived both as individual challenge and group responsibility, that giving credit to others for ideas and texts is controversial, that writing must be more productive in the social/human sciences and clear criteria for collaborative authorship are yet to be established if the number of papers published and cited are to be the sole measure to evaluate academic productivity, that in claiming rewards researchers can sometimes step in the way of other colleagues' integrity. The Biology research group data are still in need for systematization.

PT.07

Medical scientists' views on publication culture: a focus group study

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.07**

Background

The scientific enterprise has changed dramatically in the last decade. With new (internet) media platforms, a huge increase of scientific

papers published and increase of new born scientific journals, things has changed in contemporary publication practice.

Strong emphasis on scientific productivity by policy makers, funding agencies and PhD trajectories may increase a sense of publication pressure among all layers of the scientific community. The experiences, opinions and thoughts of scientists on these changes has never been systematically studied. What exactly is their experience in conducting research in these circumstances and what are possible solutions? Experiences of medical scientists and their perspective on contemporary publication practices is therefore essential; they are producing daily scientific work and therefore shape the evidence based patient care and future research.

Methods

We performed 12 focus groups among randomised scientists (PhD students, postdocs/ tenure tracks and medical professors) in 4 different university medical centers in the Netherlands, focussing on experiences in contemporary publication culture.

Results

A total of 30 PhD students, 25 postdocs/tenure tracks and 25 medical professors were randomly selected to participate in 12 focus groups. Main themes were the focus of impact factors, the ambiguous role of authorships and ranks in authorship lists, the peer review process, personal factors, the funding system, scientific misconduct and publication bias. According to the experiences, these themes have detrimental and distorting effects on publication practices and scientific results.

Furthermore, scientists tends to become more cynical towards the validity of scientific results further on in their careers. We made an overview of these themes comparing and relating them to each other.

Conclusions

Medical scientists across all layers in the scientific community have ambiguous experiences of contemporary publication culture. There are common experiences of detrimental effects and cynical thoughts of the publication culture as it is right now, such as the frequent disputes for authorships, focus on funding and the subjective way papers are published. Further quantitative research should yield new implications to improve this distorted culture to regain confidence in scientific results.

Poster Session B: Education, training, promotion and policy

Chair: Jane Jacobs, Queensland University of Technology, Australia

PT.09

Ethical challenges in post-graduate supervision

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:PT.09

Doctoral education is closely associated with the training of a next generation of researchers. In developing countries such as South Africa, there is the drive to increase the number of doctoral students enrolling at universities and for the students to complete their studies in a reasonable time. Hence, doctoral education is in the face of national reports such as the Academy of Science of South Africa's "The PhD Study" (2010), the South African Regional Universities Association's Report on Doctoral Education (2012), the South African National Development Plan 2030 (2012) and the South African White Paper on Post-School Education (2013). It is therefore no surprise that the debate is on how to recruit doctoral students, how to make them competitive on an international level and how to growth their intellectual outputs to stimulate the growth in the knowledge society.

One very important aspect is the research integrity associated with the knowledge generation and training of doctoral students. The training of doctoral students will be the focus of this paper. The primary reason being the demands on doctoral students (their research, their resources and their personal development) are often ethically challenged.

In this presentation I will engage with the following challenges in doctoral students' training:

- How professional should the relationship be between supervisor and student?
- Who should be the lead author in a publication or funding application?
- How is the Intellectual Property of a student protected?
- Is the doctoral student a mean to support the supervisor's research or to be educated as a scholar?

The paper will conclude to discuss the concept of academic citizenship. This concept will indicate that the doctoral student has both rights and responsibilities and that a lack of commitment from both parties (supervisor and student) can put doctoral education at risk.

PT.10

The effects of viable ethics instruction on international students

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:PT.10

Research question or thesis

Frequently, in the United States, it is assumed that international students enter graduate school with poorer ethical decision-making skills compared to their domestic peers. The present study sought to evaluate this assumption by having both international and US students participate in a two-day responsible conduct of research ethics education program.

Data and methods

Data collection took place during a responsible conduct of research (RCR) ethics education program at a large, public university in the southwestern United States. On day one of this two-day program, participants are introduced to the concept of research ethics, learn about institutional rules and guidelines, learn about constraints that inhibit ethical decision-making (EDM), are introduced to a model of EDM, and finally learn several strategies to overcome constraints. On day two, participants are introduced to the process of sensemaking and frames of references, learn about field differences, and, finally, apply all the information learned over the two days to several case-based examples. Data collection of demographic information took place at the end of the second day of training just before trainees complete the final measure of training. After the data were collected, sixty-seven pairs of international and US students were matched based on field of study, gender, age, and years in graduate education. In this pre-post design, participants completed a measure of EDM before and after training. This measure consists of a series of low-fidelity simulations that present ethical scenarios and ask participants to choose two options among a list of fixed responses.

Results / findings

Overall, the results indicated that international and US students are more similar than they are different with respect to how they conceptualize ethics. While differences exist in previous education, English proficiency, and multicultural upbringing, both international and US students believe that ethics is important in their personal and professional lives. Additionally, we found that RCR ethics programs are effective for both groups of students. However, US students tend to improve more dramatically than international students, who showed more modest gains in EDM skills. With this in mind, our findings that international students may not be familiar with American rules, norms, and customs illustrates that RCR ethics training is most beneficial, especially to international students, when approached from an intergroup perspective.

Implications

Based on these results, the differences between international and US students in terms of ethicality are minimal, and approaching ethics education with this mindset may help to reduce any prejudice from the outset. It appears that the acquisition of EDM skills can occur through a variety of means. Thus, along a similar vein, ethical education

programs ought to promote the idea that there are multiple, viable ways to arrive at sound, ethical decisions.

PT.11

Does (uncertainty in) language reflect the quality of research?

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.11**

Can a system that integrates funders and/or institutional review boards (IRB), (equator-network.org-based) reporting guidelines, end-users and legal frameworks reduce the main sources of research waste? Using an analysis of the key players and components of our current mainstream science system, we will argue that it can. We also reflect on the reasons behind the success of the British Health Technology Program in ensuring that 98 % of funded work gets (fully) published: (i) formal contract stipulating the requirement to publish, (ii) withholding funds until contract terms have been fully met, (iii) availability of the HTA Monograph Series, (iv) blacklisting investigators with suboptimal performance on points i-iii. We argue that end-users and systematic reviews should play an important role at the stage of research program formulation and funding decisions. Text-mining algorithms are needed to compare research reports to grant submissions and research protocols and help detect selective reporting. The role of IRBs (that capture industry-initiated research, which funders may miss) should be extended to include monitoring of research reports and to prevent publication bias and other reporting biases. Worldwide, research waste has recently been estimated to run into the tens of billions of U.S. dollars annually. Research waste has been divided into four main components: irrelevant questions, bad methodology, selective and biased reporting, and incomplete description of interventions and research methods. These components should be tackled by redesigning the research system while ensuring efficiency and automation where possible. Given the magnitude of current waste, considerable investments in end-user participation, increased monitoring responsibilities for funders and IRBs, and software that compares publications against promises made in grant submissions and research protocols seem defensible.

PT.12

Integrity complaints as a strategic tool in policy decision conflicts

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.12**

Wageningen University and Research Centre is a large organisation which combines fundamental science with the application of scientific knowledge to create value for society and nature. Wageningen UR is a collaboration of the university and a collection of applied research institutes. It upholds a shared code of conduct on scientific practice and a shared procedure for handling integrity complaints for both the university and the applied research institutes. This position creates unique challenges in the discussions on scientific integrity at Wageningen UR.

Wageningen scientists play crucial roles in the transfer of scientific insights to public and private decision-making by supplying a factual and expert knowledge base. The relation between scientific evidence, policy decisions and societal perception, however, is complicated. Decision-makers interpret, frame and structure evidence in order to apply it to their decision-making needs and policy-perspective. Sometimes the evidence from the researchers plays a strong justification role in defending a certain position. Political opponents and stakeholders with commercial or other interests who disagree with this position may and do try to disvalue the justificatory evidence in order to open the

debate. They might consider the given evidence flawed or suspect that researchers deliberately influenced evidence to serve non-scientific interests.

Therefore a well-established scientific integrity complaints procedure functions as the platform for discussion about the relation between scientific research, evidence for policy, application in practice and decision-making. Scientific reports become the object of integrity complaints that appear to move beyond the traditional realm of scientific integrity: falsification, fabrication and plagiarism.

Wageningen UR has dealt with several cases in which the impact of research in society underlies the submitted complaints.

In the presentation these case studies and the way Wageningen UR acts to deal with these complaints will be discussed.

Poster Session C: Ethics and integrity intersections

Chair: Martha Sorenson, Universidade Federal do Rio de Janeiro, Brazil

PT.14

Regulations of informed consent: university-supported research processes and pitfalls in implementation

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Research Integrity and Peer Review 2016, **1(Suppl 1):PT.14**

Research question / thesis

Main responsibility of the Deanship of Scientific Research is to protect and promote the rights and benefits of research participants and to monitor and review research project for compliance, therefore Deanship of Scientific Research has designed the Qualitative Research to find out the level of adherence to the National /International Regulations while administrating Informed Consent, its process and pitfalls if any.

Data and methods

Qualitative research in which 40 Principal Investigators administrated questionnaire through Qualtrics online survey to; 1. Find the satisfaction level on the grant process in University of Dammam and 2. To evaluate the informed consent process of IRB approved research projects. Objectives of survey was to create and sustain relevant high quality research integrity by adhering to highest moral and ethical conduct in research, develop and sustain effective mentoring mechanism for continued supervision and education and to improve compliance of national / international guidelines, codes and conduct. During fiscal year 20014 University of Dammam Supported 365 grant proposals out of those 150 proposals were approved by IRB approved, out of 150 study participants (PIs) randomly selected were 40 and invited them to participate. The participation in the research study was informed and the participation was voluntary, the Participants were explained, the purpose of research and assured confidentiality and privacy of study participants. Research questions and responses were coded and entered into a single text document using standard online Qualtrics survey software. Quantitative data entered online and analyzed analysis. The results presented as simple proportions, means, frequencies, bar charts, and odds ratios with their 95 % confidence intervals. The level of significance set is at $P \leq 0.05$.

Results

Thirty seven researchers participated in the survey, 80 % were satisfied with the support being offered through DSR by the University of Dammam. Whereas, responding to question on informed consent process; who is responsible person to obtain informed Consent (write only PI, Co-I and or Research Assistant)? 75 % of respondents PI, 8 % Co-I and research assistant /nurse 17 % . With mean value of 1.42. Responding to question, whether or not signed copy of Informed Consent was handed over to study Participant? Majority of PI i.e 63 % replied yes where 37 % did not handed over copy to study participant with mean value 1.37 with SD 0.77. 63 % handed over a signed Informed Consent copy to study Participant and 37 % did not handed over signed copies to study participant with mean value of 1.42 and SD value of 0.77. On another question; who signed the informed Consent form? 13 % signed by Co-Investigator, 72 % signed

by P-Investigator and 16 % by research assistant. 81 % mentioned the contact person's name and phone number in the informed consent form in case participant wants to contact and 19 % of researcher did not mentioned the required information in the form. 90 % of study participants understood the nature of research and risks benefits and alternative available to them, whereas 10 % of the participants could not get such information. In 87 % of cases study participant had adequate time to sign the informed consent where as 13 % of study participants were not given enough time to sign the informed consent. In 57 % responses, PI confirmed that project related tests, procedures undertaken on the day informed consent was signed and 39 % in 2-3 days of signing the informed consent. 4 % of respondents confirmed that project related tests /procedures undertaken even before getting signature on informed consent. Again 14 % of respondent did not discuss the alternative treatment options with study participant. Time given to answer the questions on research participation was ten minutes in 34 % responses, 20 minutes in 21 % of responses and 30 minutes or more in 45 % of total responses. When new information is available after study has been started 39 % respondent will continue with the protocol, 35 % were of the view that participants will be informed and the response of 26 % was that the IRB will be informed. Finally in 71 % of responses it has been found the responsibility to keep signed copied of informed consent is with Principal investigator, 6 % co-investigator and 23 % with research assistant.

Implications

Findings warrant a strong need to disseminate national and international code and conduct and national law and build capacity of researchers in Research Integrity and informed consent process in Saudi Arabia.

PT.15

A review of equipoise as a requirement in clinical trials

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:PT.15

The randomized clinical placebo-controlled trial is regarded as the gold standard of evidence in drug development. Regulatory agencies require phase III clinical trials for approval of a product; the integrity of the research trials and compliance to requirements are therefore of crucial importance. To make the use of either placebo or a comparison of two interventions acceptable, a state of uncertainty, or equipoise, regarding the comparative therapeutic merits of each arm in a trial is required. This speaks to accountability in the conduct of research, as well as agreement at the outset on the goals of the research. Respecting this uncertainty is part of adherence to regulations and policies related to research, as well employing appropriate research methods. It also prevents possible conflicts of interest. This paper aims to give a critical review – not a comprehensive account – of the concept of clinical equipoise, specifically in randomized controlled trials. Definitions of the concept are first introduced, after which viewpoints and suggested alternatives by opponents of equipoise are described. Communication among collaborators and avoidance of conflict are important considerations. It is argued that while recent criticisms of the equipoise requirement are reasonable, abandoning the requirement altogether would have largely negative consequences for participants and communities in particular settings. The paper concludes that a measure of uncertainty is required in clinical research, but that the details about what degree of uncertainty is required will mostly depend on contextual factors. Such flexibility is important to not inhibit much-needed health research and improvements in health systems, particularly in low-resource settings, i.e. a link to the obligation to consider societal benefits. Collaborating partners should be accountable to each other, to funders and most importantly to communities where research is conducted; equipoise is one way of doing that.

PT.16

The Research Ethics Library: online resource for research ethics education

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:PT.16

The Research Ethics Library is an online resource for research ethics education. It is a web-based collection of more than 90 articles written by experts on all subject areas, available at www.etikkom.no.

Our aim is for the library to serve as a resource for the academic institutions, by providing an introduction to the main issues in research ethics. Rather than presenting an encyclopedia or a set of answers, the objective is to encourage debate and reflection. Our main target groups are academic teachers and students, but the library is used by a broader public as well.

Each article serves as an introduction to a topic, but also offers case study exercises, suggested further reading and links to other resources. The articles are structured within the library's three main parts:

1. An introduction to research ethics
2. Relevant research ethics issues, such as scientific misconduct, authorship, research on vulnerable groups, human material, research and society, research and environment, bias, gender, etc.
3. Practical information, such as relevant research ethics bodies, legislation and guidelines, as well as case studies. The cases are designed to confront readers with specific real-life problems without given answers.

Since its launch in 2009, the library has become a widely used resource, frequently visited and linked to by all Norwegian universities, university colleges, as well as research institutes and government bodies.

This year, we plan to release an English-language version of the library, in response to popular demand. Forthcoming URL: www.etikkom.no/en/library

The library is unique in an international context, and we hope an English version may serve as a resource for research ethics education worldwide.

PT.17

Research integrity: the view from King Abdulaziz City for Science and Technology

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King Abdulaziz City for Science and Technology (KACST) is the central government body assuming, among other numerous responsibilities, scientific research planning, implementation and support, as well as research projects support in Saudi universities and independent research centers.

Support for scientific research in Saudi Arabia is provided through a five year National Science, Technology and Innovation Plan (NSTIP), which KACST supervises and implements, in addition to a program to fund research projects in universities, independent of the NSTIP, run by the General Directorate for Research Grants (GDRG) at KACST. From 2008 till the end of 2014, KACST implemented Saudi Arabia's first extended Science, Technology and Innovation Plan, for which more than 2.5 billion USD were budgeted, identifying the fifteen priority science and technology fields where research was needed.

Furthermore, KACST consulted with the American Association for the Advancement of Science (AAAS) to evaluate research projects submitted for funding during the execution of the first plan.

KACST has developed strict criteria of research integrity, stipulating that researchers agree to them before submitting their research projects electronically.

This paper summarizes statistics related to the overall research proposals submitted to KACST through the NSTIP, as well as those submitted to the GDRG, during the 2008-2014 period under the NSTIP, and from 2013 to the end of 2014 through the GDRG program.

The data pertaining to scientific research integrity violations in the NSTIP is based on AAAS reports, whereas the statistics related to GDRG were compiled by KACST using the iThenticate program to detect scientific integrity violations.

In total, 5131 research project proposals were submitted for funding and were evaluated within the NSTIP and the GDRG. Science integrity violations were detected in 190 of the research project proposals, amounting to 3.7 % of the total number of proposals submitted.

This paper presents an analysis of the percentage of science integrity violations in each scientific field of research, as well as the most common violations in the research proposals submitted during the period of the study. These statistics can be considered to be official as they were prepared by the chairman of the KACST Science Integrity Committee.

PT.18

Meeting global challenges in high-impact publications and research integrity: the case of the Malaysian Palm Oil Board

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Most researchers in Malaysian research institutes are required to conduct research and publish results with a goal to develop a comprehensive model for consideration. They then ought to contemplate when selecting a journal for submission of a manuscript. Journal selection and right match are particularly important to researchers, even though they publish in a range of academic forms and forums, including conference abstracts, book reviews, papers in conference proceedings, invited chapters in books and monographs. However, it is the peer-reviewed, number of citations, H-index, impact factor and open-access journal articles that receive the most notice from promotion panels and search committees in most Malaysian research institutions.

At the same time, Malaysian research institutions, in particular, the Malaysian Palm Oil Board (MPOB) is in the process of building and supporting a strong research integrity office which embodies a range of good research practice and conduct namely intellectual honesty in proposing, performing, and reporting research, accuracy in representing contributions to new research proposals (NPP) and reports (CRAR/VIVA), fairness in peer review, collegiality in scientific interactions, including communications and sharing of resources, transparency in conflicts of interest or potential conflicts of interest, protection of human subjects in the conduct of research, humane care of animals in the conduct of research and adherence to the mutual responsibilities between investigators and their research participants in most areas of her oil palm and palm oil research-based divisions. This basis has led to the recent impressive quality and quantity of research publications within MPOB; either it is science or social science and humanity based. Meanwhile, the quality and quantity are underrepresented in the global knowledge-based citation and impact factor top notch journals related to oil palm/palm oil research. This is a concern not only of MPOB, but of other Malaysian research institutions.

A national effort is underway to make MPOB scientific and social information affordable, bypassing the profit-making international scientific and social science journal publishers. Using the Internet creates the possibility of establishing alternative models for the dissemination of information. The problems may be addressed by facilitating free access to scientific and social information in electronic form to global users such as that of MPOB's Journal of Oil Palm Research (JOPR). It is with great hope that research publications and journals in Malaysia should be now make available online for the national and global audience through the initiatives of governmental and

private non-profit publishers. Scientific and social oil palm/palm oil related research must provide findings and evidence upon which political decisions can be based upon. This paper also addresses the fact that today's global oil palm/palm oil research challenges require us to use science, technology and humanity as a tool of diplomacy.

The next requirement is to build and publicize the scientific and social consensus which is the foundation for an effective highly impacted international action and dissemination. Subsequently, it is to seek the contribution of authors from the more advanced and industrialized countries to publish in local MPOB journals, and their participation in collaborations with the local researchers.

It is clear that there is a dire need for the researchers in MPOB to focus more on the journals with the ISI Thomson and Scopus ranked open access journals within the Q1-Q2 JCR Thomson Reuters/Scopus Ranked Journals published either locally or internationally, which arguably are important means of disseminating international scientific and social research to the region. In its final analysis, a researcher's work in technology-based industry-friendly is emblematic of the academically rigorous and high-impact research that should be conducted in Malaysian research institutions. This requires a strong culture of research technological innovativeness and entrepreneurship across all MPOB's science and non-science based oil palm/palm oil related disciplines. Hence, research institutions, especially MPOB should complement that work of a world-class research on the corporate as well as academic oriented mechanisms, by mobilizing innovative inventions into the marketplace and to re-brand it as world class Innovative, industry-friendly research institute.

References

¹An Invited Poster Paper Presented at the 4th World Conference on Research Integrity, May 31-June 3, 2015, Rio De Janeiro, Brazil.

PT.19

University faculty perceptions of research practices and misconduct

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This poster presentation shares preliminary results from a national survey, funded by the U.S. Office of Research Integrity, to investigate the perceptions of research misconduct by faculty researchers from four disciplinary areas (biology, social work, sociology, and psychology). About 4,500 faculty from 107 randomly selected research-intensive and master's comprehensive universities were invited to participate. Respondents assessed scenarios depicting more and less serious researcher misbehavior and reported how likely they would be to take those actions under the same circumstances. They also rated their perceptions of how wrong the actions were, how likely the actions were to become known to others, and what sanctions might be applied if the actions were to become known. In addition, respondents reported their perceptions of organizational justice in their own research environments and the level of funding they are expected to garner to support their own salaries.

Poster Session D: International perspectives

Chair: Margaret Faedo, University of Sydney, Australia

PT.21

The Commission for Scientific Integrity as a response to research fraud

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As in many other West European countries there is no national legislation on research fraud in Belgium. Hence, there is no national legal body

responsible for inquiries into breaches of research integrity. All Flemish universities each established their own Committee for Research Integrity responsible for investigating possible cases of fraud and questionable research practices. They have however no juridical means as do legal entities to investigate this kind of 'criminal' behavior. The composition and working process of these committees is somewhat different over the universities in Flanders. Similar is that these committees often consist of several members of the professorial staff (own academic community). Through interviewing and analyses of the research material, the committee tries to reconstruct the 'suspicious' actions. On Flemish level there is a Flemish Committee for Research Integrity, if cases involve several universities or in case one of the parties involved in the university inquiry wants a second opinion.

In practice, this constellation raises a lot of questions. Are these committees the most appropriate way to deal with cases of fraud? Do 'ordinary' professors match up to often hardened cheaters? What authority committee members have to 'investigate'? What means committee members have to 'investigate', related to the principle of justice? How firmly can these committee members push through their demands, f.e. if a suspect won't cooperate with the investigation? How can they make their judgment count in the community? And beyond? Can universities simply decide on the working process of their own 'criminal investigation'? How to deal with inactivity in university boards f.e. no willingness to make hard decisions? All of these questions will be discussed from several real life (anonymous) cases.

PT.22

Are notions of the responsible conduct of research associated with compliance with requirements for research on humans in different disciplinary traditions in Brazil?

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Responsible conduct of research (RCR) has increasingly been adopted as an umbrella term addressing responsible research practices in the most diverse disciplinary settings. This RCR notion encompasses the proposal, performance, review and communication of data to peers and to the public. Conducting research projects involving human subjects according to national ethical requirements is interpreted as responsible research practice by many disciplinary communities. This assumption is corroborated by submission of research projects, especially in biomedical sciences, for ethical appraisal of Institutional Review Boards [IRBs in the US, equivalent to CEPs in Brazil]. However, there is some controversy in Brazil over whether CEPs have a legitimate role to assess the ethics of projects for all research fields, as concepts of human subjects protection have roots in health-related research. An issue is whether this controversy may impact perceptions of RCR for the broader Brazilian research community. Our research question is how this controversy may reflect on ethical requirements for projects conducted in graduate programs in the biomedical, social sciences, and humanities in Brazil. To address this question we have investigated these requirements through official documents for proposal and development of graduate projects. From Jun 2014 to Aug 2014, we collected data on 82 graduate programs in these areas, from 6 Brazilian universities: UFRJ, UFF, UERJ, UNIFESP, USP, and UNICAMP, which allocate a considerable amount of Brazilian research funding. Our results indicate that formal requirements for submission to IRBs in non-biomedical fields are made by 10 programs in 5 universities. Our results challenge the idea that compliance with ethical requirements for research on humans is associated to RCR notions, for different disciplinary traditions. They also suggest that institutional practices in graduate programs for research on humans may provide valuable insight into how far international perceptions of RCR are shared in the broader research community.

PT.23

Creating an environment that promotes research integrity: an institutional model of Malawi Liverpool Welcome Trust

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In our commitment to create an environment that promote responsible conduct by embracing, lawfulness, trustworthiness and standard of excellence, MLWs goal is to foster a culture in which high ethical standards are norm. We present that support given to researchers during their conduct of research activities on a day to day basis which ensures protection of human subjects, adherence to rules and regulations, training, document management and mentorship role provided to junior researchers. In our zeal to responsible conduct of research, innovative systems have been set in place in order to continue and sustain a conducive environment to promote research integrity. Internal controls include interrelated processes as monitoring of research activities, science communication and a controlled environment. This however has helped researchers attitudes, knowledge and behaviour adherence towards responsible conduct of research. Conclusive policies and guidelines specifically for responsible conduct of research need to be established and implemented.

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PT.24

How do science policies in Brazil influence user-engaged ecological research?

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Previous studies have shown that Ecologists are moved by the personal desire of doing research that contributes to better societal outcomes. An emerging body of literature has pointed out that in order to solve these real world problems, scientists need to work with potential knowledge users throughout the process of investigation on what's called "user-engaged research". The dissemination of this approach in academia would mean a shift in the way most scientists conduct their work, but it's not clear to which extent these changes would be welcome on research institutes that function under formal publication requirements and rewards systems.

This study is part of a comparative NSF-funded project that aims to understand how Science Policies work across the Americas (Brazil, USA, Canada, Mexico and Peru). For that purpose, we used document analysis and conducted semi-structured interviews with ecology researchers to investigate how these policies affect the kind of work that gets done by them.

Brazil in particular, has increased its international reputation in science lately through a process of intensification of scientific production associated with some research evaluation and incentives programs. CAPES and other public agencies have played an important role on that progress. In this analysis we expose how the policies created by these agencies have affected Brazilian researchers' experiences both positively and negatively. In that manner, we hope to contribute with critical insights to further develop the structures of science in the country and elsewhere through ways that fosters respect to the principles and responsibilities of the Singapore Statement on Research Integrity.

Poster Session E: Perspectives on misconduct

Chair: Sue O'Brien, University of Queensland, Australia

PT.26

What "causes" scientific misconduct?: Testing major hypotheses by comparing corrected and retracted papers

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The likelihood to commit scientific misconduct is believed to be associated with various sociological and psychological factors, the real effects of which remain poorly tested. Hypotheses most commonly invoked in the literature include the effects of culture and research environment (henceforth, Environmental hypothesis), the control effect exerted by colleagues (Social Control hypothesis), pressures to publish (Publish or Perish hypothesis), and the higher risk of committing misconduct for early-career (Early Career hypothesis) and male researchers (Gender hypothesis). Existing evidence from these hypotheses is scarce, and comes mostly from surveys and interviews. Surveys have the advantage of providing an almost direct insight into how scientists interpret their behaviour, but what scientists think and say might not necessarily reflect what they actually do.

This study, partially funded by the Committee On Publication Ethics, combined hand-coding and advanced bibliometric methods to measure relevant characteristics of the authors of papers that were corrected or retracted, and compared them to a control sample of non-retracted and non-corrected papers published in the same journal and issue (for a total sample size of over 9,000 papers). Corrections to the scientific literature are a precious yet overlooked source of evidence about scientific integrity. Unlike retractions, corrections carry no stigma, are issued by all journals, and are usually requested spontaneously by authors themselves. Although they are the consequence of a mistake, and might therefore reflect "sloppiness", corrections entail a cost to the author with no benefit, and can therefore be considered a proxy of the positive side of scientific self-correction: the action of authors who wish to preserve their reputation and avoid misleading their colleagues. Therefore, sociological and psychological characteristics that lead to retractions (most of which occurs because of scientific misconduct) should have an opposite effect on corrections, and vice-versa.

Preliminary results, based on characteristics of first-authors, showed marked differences between corrections and retractions. Retracted papers were significantly more likely to have a first author based in Germany, China, Japan and South Korea, as well as Australia, India, and Turkey. Most other countries showed, instead, a tendency to retract less than average. Corrections showed much less variability, and tended to be rarer for authors in Brazil, Japan, China and other non-English speaking countries. Whilst the latter effect suggests lower attention to scientific integrity in these countries, the former effect probably reflects a combination of high rates of misconduct and efficient research integrity policies. Furthermore, retracted papers were more likely to be authored by early-career researchers, and authors with below-average publication productivity and impact. Corrected papers, instead, were more likely to be authored by larger teams, by males, and by authors with outstanding publication profiles.

These results support the Environmental, Social Control and Early Career hypotheses, but falsify the Publish or Perish and the Gender hypotheses. The impression of higher misconduct amongst males and highly productive authors might result from the skewing effects of "prolific retractors", which previous studies failed to control for.

PT.27

Perception of academic plagiarism among dentistry students

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Plagiarism is present in the world since humans developed a writing system. However, a larger interest aroused when it brought financial and intellectual impairments. Even though it has been increasingly emerging in media and has been discussed academically, its precise definition is not clear. A good definition can be "Appropriation of another person's ideas, processes, results or words without giving appropriate credit" (US Office of Science and Technology Policy, 2000). In this study we addressed full, conceptual and partial plagiarism. The objective of this study was to assess the knowledge level of students' enrolled in the Dentistry course of Universidade Estadual do Sudoeste da Bahia about the issue plagiarism, its pertinent legislation, the used research sources and how the copyright of the images are processed. The study took place at Universidade Estadual do Sudoeste da Bahia in 2013. The research subjects were 199 dentistry students. 186 (93,5 %) answered the questionnaire with 16 questions. It was made a subsequent analysis of its answers by SPSS.

We could conclude that dentistry students do not have full knowledge of what plagiarism is. Even this being a recurrent issue in the media and discussed in academic life, most students did not know how to respond clearly to the questions asked. It can be noted that the basic content of the law on the topic, that plagiarism is a crime and may result in penalties is understood by the majority of students. However, they could not identify clearly the specific cases of plagiarism, as conceptual or partial plagiarism, nor was it clear for them that the incorrect use of indirect citations may be considered plagiarism.

Reliable sources has been used by the most volunteers. However, participants showed no concern relative to the use of third party images in academic papers or with the sources from which these images are obtained or even with the possibility that they may involve copy rights. A small portion declared that they take correct precautions, using free access images, asking for permission to use protected images, or producing their own images.

Because of the relevance of the theme, the need to enhance this research to the other courses of this and of other universities is registered here, in a way to obtain a survey of how this subject is being approached in the undergraduate courses. Besides, the importance is stated of designing a booklet to disseminate information and combat plagiarism.

PT.28

(Quite) a few bad apples?: Prevalence, patterns and attitudes towards scientific misconduct among doctoral students at a German university hospital

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The objective of this study was to ascertain the prevalence of scientific misconduct among doctoral students at a large German university hospital and provide a more nuanced picture of the patterns of and attitudes towards research integrity and quality.

Methods: During a mandatory lecture on good scientific practice (GSP) with 159 doctoral students, 142 (89 %) anonymously completed a questionnaire containing ~60 questions on basic knowledge about

GSP, rates of scientific misconduct (witnessed), rates of scientific misconduct (committed), and attitudes toward GSP.

Results: 46 % of participants reported having witnessed scientific misconduct at least once, with 34 % reporting multiple instances. 20 % reported having engaged in misconduct at least once, with 7 % admitting having done so on multiple occasions. Knowledge of GSP guidelines depended on institutional distance: 13 % did not hear of the institution's guidelines, 37 % of national guidelines, and 52 % of international guidelines (chi square $p < 0,0001$). On attitudes, 17 % indicated they would commit one of two types of scientific misconduct (data fraud / honorary authorship) if the Dr.med. grade depended on it, 31 % if a publication depended on it, 33 % if a grant application depended on it, and 37 % if the successful completion of the Dr.med. depended on it. Altogether, 50 % of respondents indicated they would engage in misconduct in none of these four circumstances and 13 % in all four circumstances. There was no correlation between length of doctoral studies with either prevalence of misconduct, knowledge of GSP guidelines, or attitudes.

Conclusions: The data show that even at the most junior level of academia, scientific misconduct is frequently witnessed and committed. The absence of a correlation between length of doctoral studies and prevalence of misconduct, the high proportion of multiple instances of scientific misconduct, and the data on attitudes suggest a "few bad apples" phenomenon, with the most researchers and research groups not committing fraud, but a significant minority engaging in it repeatedly and systematically. In other words, once GSP has been breached personally or within the direct research environment, it is more readily violated again. This suggests early preventative measures as the best way to increase research integrity among young researchers.

PT.29

Analysis of retraction notices published by BioMed Central

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Research Integrity and Peer Review 2016, 1(Suppl 1):PT.29

Objectives

The objectives of this study were to assess i) the main reasons why articles are retracted from BioMed Central journals, ii) whether retractions adhered to the Committee on Publication Ethics (COPE) guidelines.

Design

Retrospective analysis of the quality of retraction articles from January 2000 – December 2014.

Results

BioMed Central journals published 77 retraction notices in the time frame of this study which constitute 0.04 % of total articles published (162,273). A justification for the retraction was declared in all notices. 56 % were retracted by the authors, 26 % by the Editor(s) and 8 % by the Publisher. 10 % of retraction notices did not state who had retracted the article. The most common reason for retraction was plagiarism (26 %), followed by problems with the data i.e. the data was found to be 'unreliable' (16 %), lack of appropriate ethical approvals or permission to use data (13 %), duplicate publication (10 %), published in error (9 %), image manipulation (8 %), or because not all authors were aware of the manuscript submission and publication (6 %). 8 % of retractions within the last two years were due to data fabrication or because the peer review process had been compromised - reasons that were not seen prior to 2012. 4 % were due to undeclared conflicts of interest. Almost half of retractions (47 %) occurred due to authors committing some form of publishing misconduct (e.g. plagiarism, duplicate publication, co-authors unaware of submission).

Conclusions

COPE guidelines on retraction were adhered to in that an explicit reason for retraction was given in all cases of retraction. However, some notices did not document who retracted the article and there were ambiguities as to the underlying cause (error or misconduct). Authors are taking responsibility for retracting articles when necessary with the most common reason to retract an article being due to

plagiarism. Retractions due to plagiarism could possibly be reduced by screening manuscripts before publication, although this is not guaranteed. Retractions due to problems with the data (including fraud) are difficult to prevent, but data sharing and deposition prior to publication should help address this. Adopting a checklist (linking to COPE guidelines) and a standard template for various classes of retraction notices would facilitate increased transparency and consistency of retraction notices in future.

PT.31

"He did it" doesn't work: data security, incidents and partners

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Research Integrity and Peer Review 2016, 1(Suppl 1):PT.31

Our institution conducts social-behavioral research and evaluation with several hundred Federal government grantees and sub-contractors at any one time. While many aspects of the partnerships are successful, our partners struggle to consistently follow the security procedures required to protect participant data. For example, personally identifiable information (PII) that our organization is authorized to receive has been emailed to us un-encrypted, paper with PII is misplaced for several months, and non-participant data has not been excluded from our cohorts' datasets! Our Institutional Review Board has partnered with our Information Security and Contracts Departments to create strategies to reduce these risks that include 1) explicit security requirements in contracts and data agreements, 2) training of partners on data security procedures and responding to incidents and 3) procedures to protect research participant data while stored and in transmission. Our program targets three key areas of security in program implementation, starting with the contract and data agreements. We have required language built into our sub-contracts that describes the required data security procedures such as transferring data via secure web portal and encrypting data. The subcontract also defines the expectations we have if participant data is lost. We then conduct in-depth in person training for all partners who handle research participants' PII. The training reviews the project specific procedures to be followed as well as the background, history, and purpose of data security using real examples of data breaches and the consequences. At the end of training staff sign Individual Investigator Agreements to pledge their commitment to the procedures they have learned. For longitudinal studies, we conduct low-cost refresher training to reinforce the importance of data security via webinars, bulletins, tailored posters, and focused 1:1 re-training as needed. To make the secure transfer of PII easy, we have set-up a user-friendly portal and provide clear guidance on using the portal. Internally we systematically track all PII carefully using data security plans, several methods of checks and balances, and quick incident response if it appears PII has been disclosed or misplaced. Evaluation measures include number of partners trained, reduction in security incidents, and reduction in disclosure of PII. Grantees and sub-contractors can implement the data security practices in their own organizations to strengthen the protection of their own program clients' PII. Our organization and others like ours can implement these strategies company wide and build strong data security cultures.

Poster Session F: Views from the disciplines

Chair: Paul Taylor, University of Melbourne, Australia

PT.32

Robust procedures: a key to generating quality results in drug discovery

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The *in vitro* and *in vivo* experimental procedures and protocols applied in early discovery in the pharmaceutical industry are the foundation of identifying quality drug candidates. This robustness of such preclinical studies is the key to selection of lead candidates that are less likely to fail at a later stage of drug development. In the discovery environment this is often challenging. This is especially true for methods applied for analysis of large molecular entity, where the dynamic range of the detection is limited. A systematic approach to development of robust analytical methods can help ensure reproducible, reliable results. Effective collaboration between researchers and statisticians is most beneficial in determination of the linear range of standards as well as accuracy and precision of data generated. Often in the preclinical research environment, where protocols cannot be based on a full-fledged validation process, statisticians can incorporate tools that reduce bias involved in calculation of the results. This poster will provide some examples of how such statistical processes can be implemented as part of a quality assurance measure with respect to drug discovery data.

PT.33

Health promotion: criteria for the design and the integrity of a research project

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The promotion of health is one of the strategies of disease prevention, fitness and aesthetic and social inclusion. Public health policies has special interest in this aspect due to cost reduction and optimization of the maintenance of the welfare of the population. Thus the authors of this study have established the criteria for the design and integrity of a research project on health promotion to be run in a public school in the city of Belo Horizonte - MG with elementary students. Educational activities in science education were planned contemplating intervention actions, for example, personal hygiene and nutrition guidelines in accordance with institutional policies on research advocating merit, relevance, methodological adequacy, integrity and qualifications of researchers. The choice of sample space and audience were defined according to the situational diagnosis of the school to which the proposal was submitted and granted authorization by the head. The choice of undergraduate students occurred through selection process institutionally disseminated through a notice which included analysis of Curriculum Vitae and interview candidates. Two members from among 10 candidates met the requirements excellently and were accepted as part of the team. To the funding system was chosen for competition in a notice of a public foundation of the state with the detailed description of the fate of the necessary resources to which they were granted 60 % of the items. To ensure transparency in project execution, partial reports are issued periodically for financial support institution and the department of institutional research. The integrity of the proposal is being achieved. Fact which is proved by the institutional indicators, answering the original methodology and satisfactory results. The authors acknowledge the financial support of Fapemig.

PT.34

Integrity of academic work from the perspective of students graduating in pharmacy: a brief research study

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Transparency in research involves aspects of ethical and moral character often associated with behavioral conduct of the researcher. Undergraduate courses have a duty to technical training, critical, reflective, entrepreneurial,

human and moral students, tasks that are developed throughout the course and must be accompanied by the professors involved. We note that for running academic work many students are unaware of the issues surrounding the integrity of research, which compromises the integrity of the results. Thus the authors of this study proposed a descriptive research on the perception of undergraduate students of Pharmacy from an Institution of Higher Education in the city of Belo Horizonte - MG before the execution of academic work regarding the responsible conduct. For this a semi-structured questionnaire was administered during the school schedule of classes, in which 128 students from different periods participated voluntarily and anonymously. The majority (76 %) claimed to have already conducted a literature search. When asked about their knowledge of manual standardization institution 88 % confirmed. On ways to source citation researched 78 % know what a direct quote and 74 % know what is an indirect quote. Most students know the meaning of plagiarism (91 %), but unaware of the significance of self-plagiarism (77 %). Most participants (78 %) said they always cite the source of research, being identified as key: journal articles (50 %), internet (24 %), books (22 %) and newspapers (2 %). It is observed that in general most students have knowledge and adopts appropriate procedures for implementation of academic work, but a small portion features not always intentional misconduct which suggests the need for continuing education.

PT.35

Research integrity promotion in the *Epidemiology and Health Services*, the journal of the Brazilian Unified Health System

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Research Integrity and Peer Review 2016, 1(Suppl 1):PT.35

Epidemiology and Health Services (RESS) is a quarterly and open-access journal, published by the Health Surveillance Secretariat of the Brazilian Ministry of Health. It was created in 1992, under the title Epidemiological Report of the Brazilian Unified Health System, and in 2003, it was renamed to RESS. In 2011, there were set strategies aiming to attain its indexing in broader and international bibliographic databases. In 2012, the authors' guidelines were revised, including the request to include an authors' contribution section, and the information that RESS had adhered to principles defined by the Committee on Publication Ethics (COPE). In 2013, the Portuguese-translated version of the Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals, from the International Committee of Medical Journal Editors (ICMJE) was published. Thereafter, RESS started to adopt the four criteria for authorship as defined by ICMJE, as well as the statement of responsibility for the entire content of the manuscript for all authors. In 2014, the Portuguese-translated version of the Montreal statement on research integrity in cross-boundary research collaborations, from the 3rd World Conference of Research Integrity (Montreal, 2013), was published. In 2014, RESS has released to all invited reviewers the Portuguese-translated version of the Guidelines for peer reviewers produced by COPE. In the period 2011-2013, the annual number of articles submitted to RESS increased from 171 to 320, and the number of published articles increased from 54 to 70. Those increases may be partially attributable to the research integrity promotion activities in the journal, which had strengthened the recognition of its scientific character. The publication of Portuguese-translated versions of documents related to research integrity may have contributed to the increasing recognition of research integrity principles within RESS' community and also in the broader community of public health researchers in Brazil.

PT.36

When are clinical trials registered? An analysis of prospective versus retrospective registration of clinical trials published in the *BioMed Central series*, UK

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Thesis

Clinical trials should be registered with an appropriate trial registry before participant recruitment begins. However, many trials are not registered until a later stage. Our objective was to analyse the percentage of articles published in BMC-series journals in 2013 reporting clinical trials that were registered prospectively and retrospectively.

Methods

We identified all research articles published in 2013 in the BMC series that report outcomes of a clinical trial according to the World Health Organisation definition of a clinical trial. We excluded articles reporting secondary analyses of results from previously reported clinical trials and studies where the primary outcomes had already been published.

For each included article, we identified whether the study was registered prospectively (before the date of recruitment as given in the trial registry record) or retrospectively (after the date of recruitment as given in the trial registry record). For studies that were registered retrospectively, we analysed whether registration occurred before or after submission of the manuscript to the journal. For those studies registered retrospectively, but before submission of the manuscript to the journal, we calculated the number of days between recruitment and registration.

We also collected data on the trial registry used and the country of affiliation of the first author.

Results

In 2013, 117 clinical trials were published across 22 different journals in the BMC series. Of these, 28.2 % (33) were registered prospectively, 68.4 % (80) were registered retrospectively, and 3.4 % (4) did not give a trial registration number. Of those registered retrospectively, 92.5 % (74) were registered before submission to the journal and 7.5 % (6) were registered after submission to the journal.

For those registered retrospectively, but before submission to the journal, the mean number of days between participant recruitment and registration was 525. Of these, 14.9 % (11) were registered within 30 days of the study recruitment date. 17.6 % (13) were registered within 50 days of the recruitment date.

Trials were registered across 20 different approved registries, with 61.1 % (69) being registered with clinicaltrials.gov. First author affiliations were from 30 countries, across six continents.

76.1 % (89) of included studies were randomised controlled trials (RCTs), 11.1 % (13) reported pilot RCTs and 12.8 % (15) reported interventional studies that did not involve randomisation.

Implications

Almost 10 years on from the International Committee of Medical Journal Editors recommendation that prospective trial registration be a condition of publication, our results show that many clinical trials are still not prospectively registered.

The large number of retrospectively registered trials identified demonstrates the importance of allowing retrospective trial registration to prevent non-publication of valuable research involving human subjects. It also highlights, not only the need for further initiatives to improve registration, but also a need for the clear linkage of published articles to trial registry records and for the transparent inclusion of the date of registration in published articles.

PT.37**Maximizing welfare while promoting innovation in drug development**

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Though current literature identifies ethical uncertainties and risks associated with the conduct of clinical trials, and discusses how to improve individual processes such as the informed consent process and the monitoring process, it does not provide a comprehensive framework and related tools for individual players to use in order to develop their strategies. Additionally, current literature focuses on the decisions that have been or could be made by individual players, without sufficient

consideration of the impact of the decisions or strategies of one player on the subsequent decisions or strategies of the other players. This research aims to identify ethical challenges in the conduct of clinical trials, develop a framework for determining the best strategies to convert ethical uncertainties into manageable risks, and to provide tools for each of the decision makers to approximate their respective gains and losses based on decisions made by the various players involved in the clinical trial process. This is accomplished using the following methods: i) use of inductive reasoning to develop a conceptual framework based on documentary and literature analysis; ii) validation of framework through expert interviews; and iii) using game theoretic approach to illustrate interdependent decision making of the various players in the clinical trial process. The current poster presents the following: i) proposed framework for identification of ethical risks and uncertainties; ii) comparison of how US and India, as examples of a traditional and an emerging market, address these within their respective regulations; iii) enforcement pyramid for regulatory oversight of clinical trials in the US, and proposed modification to the pyramid based on results of expert interviews; and iv) proposed relationship structure for interdependent decision making based on expert interviews.

Other posters that will be displayed but not presented orally**PT.38****Geoethics and the debate on research integrity in geosciences**

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Geoethics consists of the research and reflection on those values upon which to base appropriate behaviours and practices regarding the Geosphere. One of its most important goals is to make geoscientists more aware of their social responsibility in conducting research activities, in producing and spreading data and scientific results. Moreover, Geoethics highlights the necessity to follow ethical principles in the relationships with colleagues, as an important requisite to guarantee the high quality of science.

Given the evident ethical, social and economic repercussions that the behavioral choices of geoscientists may have on society, responsible research, transparency in dissemination of results of scientific studies and data integrity are fundamental elements, to be considered by the geological community.

In order to give to these issues the right space and to encourage the discussion about them, the IAPG (International Association for Promoting Geoethics) from some years has included among its main objectives the promotion of the research integrity principles, as expressed by the Singapore (2010) and Montreal Statement (2013).

Basically, the IAPG was born as a multidisciplinary, scientific platform for widening the debate on problems of Ethics applied to the Earth Sciences. Through international cooperation, Geoscientists have the opportunity to discuss on issues regarding the quality of their work and skills and the necessity to improve their knowledge and the value of a life-long learning. Moreover, the debate focuses on how plagiarism, misconduct and data falsification are not only dishonest actions but can have dramatic consequences for the population, especially when we are facing natural hazards, environmental problems and exploitation of geo-resources.

Intuitively, the awareness of the importance of these issues is present in all geoscientists, but not in an explicit and shared manner. For this reason, the IAPG has assumed the responsibility to join forces of Geoscientists all over the world, in order to understand problems and find solutions, also through the analysis of case-studies to be taken as models.

The IAPG, through the activities carried out by its members and the increasing number of articles and books published, is becoming a point of reference for geoscientists, able to provide them with a

framework of values that can guide and support them in a research activity that is really a benefit to society.

PT.39

Introducing the Professionalism and Integrity in Research Program (P.I. Program)

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The Professionalism and Integrity in Research Program (PI Program) is the first large-scale, systematic remediation program for researchers who have had lapses in research integrity or compliance occur in their labs. PI Program was funded by the US National Institutes of Health, featured in *Nature Magazine*, and received the 2013 Health Improvement Institute's Annual Innovation Award in Human Research Protections.

Lapses of research integrity and compliance have adverse effects on diverse stakeholders. For example, data falsification introduces false or misleading information into the scientific record and animal care violations compromise the wellbeing of animals and create public controversy. When research is government funded, even relatively minor violations—when repeated or when bad consequences occur—can lead to significant financial penalties to institutions and loss of research privileges for individual researchers.

Informed by the best available evidence, the PI Program is designed to address the root causes of integrity and compliance lapses. It aims to help researchers to: manage stress and urgency; use effective decision-making strategies (e.g., seeking help, managing emotions, and testing assumptions); and develop the management and other skills they need to conduct excellent research with integrity. The PI Program involves several elements: an enrollment interview; a 3-day face-to-face workshop; pre- and post-workshop assessments; and post-workshop coaching calls. The workshops are held with 2 faculty members and up to 8 participants. Several measures are taken to promote confidentiality and a secure sharing environment. To-date the PI Program has trained 35 participants from 27 universities throughout the United States. Participants do research in medicine, public health, basic sciences (e.g., biology and chemistry), psychology, and engineering. In 2016, the PI Program will publish data on pre- and post-workshop changes in professional decision-making and the perception of compliance rules, employment retention, implementation of professional development plans, and workshop evaluations by participants. Preliminary data analysis indicates statistically significant improvements on several measures. The PI Program development team and program are described more fully at <http://integrityprogram.org>.

PT.40

Validation of the professional decision-making in research measure

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With funding from the US Office of Research Integrity, we developed parallel forms of the Professional Decision-Making in Research Measure (PDR), each with 16 vignette items that present diverse challenges to professionalism and integrity in research. Challenges include dealing with suspected data fabrication, incompetent research staff, pressure to meet unreasonable deadlines, and uncertainty regarding compliance requirements. Following each vignette, the PDR presents 6 options. Participants identify the 2 of 6 options they would be most likely to choose if they found themselves in the situation described. Options are coded as more or less professionally effective insofar as they are consistent with the use of professional decision-making strategies that have been

validated in the literature. Such strategies include seeking help, managing emotions, anticipating consequences, recognizing rules, and testing assumptions. The PDR was administered online to 300 federally funded independent investigators and trainees with a battery of validation measures. The PDR demonstrated good parallel form reliability, $r(0.70, p < .01)$ and good variance (range 4 – 32, $M = 26.37$, $SD = 4.57$). The PDR was not significantly correlated with social desirability; it was significantly correlated with all convergent validity measures as predicted using an alpha of $p < .01$: moral disengagement ($r = -.32$), cynicism ($r = -.26$), and narcissism ($r = -.15$). An open-access article on the validation of the PDR was published in *Science and Engineering Ethics*, available online on June 14, 2015.

PT.41

General guidelines for research ethics

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Research Integrity and Peer Review 2016, **1(Suppl 1)**:PT.41

The Norwegian National Research Ethics Committees are independent agencies for questions regarding research ethics, and investigation of misconduct, within all subject areas. In 2014 the committees developed and published General Guidelines for research ethics. The Guidelines are not intended to replace subject-specific guidelines, but should serve as a gateway to the principles and concerns of research ethics, including for institutions and individuals who are not researchers themselves. Our aim is that the Guidelines should be used in ethics training for all Norwegian PhD students.

The main principles are:

Respect. People who participate in research, as informants or otherwise, shall be treated with respect.

Good consequences. Researchers shall seek to ensure that their activities produce good consequences and that any adverse consequences are within the limits of acceptability.

Fairness. All research projects shall be designed and implemented fairly.

Integrity. Researchers shall comply with recognized norms and behave responsibly, openly and honestly towards their colleagues and the public.

The Guidelines consist of 14 bullet points (here presented without descriptions): 1. Quest for truth, 2. Academic freedom; 3. Quality; 4. Voluntary informed consent; 5. Confidentiality; 6. Impartiality; 7. Integrity; 8. Good reference practice; 9. Collegiality; 10. Institutional responsibility; 11. Availability of results; 12. Social responsibility; 13. Global responsibility and 14. Laws and regulations.

PT.42

A national forum for research ethics

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The forum for research ethics is an arena for cooperation and exchange of experience for all those who work in the field of research ethics. The purpose is to improve the quality of research ethics in the Ph.D. education and the work of the ethics committees at the universities and colleges.

The forum was established by the Norwegian National Committees for Research Ethics in 2012. A survey from 2011 showed that research education has come a long way concerning ethical learning and questions. But it also showed an unused potential in sharing experiences on a national level. The aim of the forum is to establish a closer collaboration across the different universities and their committees. Further is the forum a resource for the participants to exchange knowledge and get inspired by others work in e.g. teaching research ethics.

For each forum the topics are set on the background of the last year participants' suggestions and what the national research ethics committees see the need of, regarding the discussions in the field at that time. Topics that have been discussed are plagiarism, internet research and privacy regulations. The number of participants has been around 70 since the first meeting in 2012. It has been difficult to raise the number and it is often the same persons from the same universities and colleges that return every year. The challenge is to reach out to the institutions with low or non-participants. The forum has made an increased awareness and interest for research ethics in the universities and colleges. Some of the institutions have even established their own research ethics committees. We hope that this can inspire other countries to establish an arena for research ethics, to increase awareness, interest and promote responsible research.

PT.43

Evaluation of integrity in coursework: an approach from the perspective of the higher education professor

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In the scientific field, the investigation process has designated reflections about the integrity of research in superior education, with a focus on procedures linked to the search for information for theoretical basis, for textual productions and their important applications in everyday life, mainly in Academic Course Work. The use of methods to understand reality and within the framework of systematic research, is noticed a gap to the stimulus of the authorship construction exercise that, in contemporary times, becomes an eloquent discussion in academic and scientific community. In this context, the research highlighted here, is intended to present an analysis of the view of superior education professor, on the research integrity in the context of the Course work. Semi-structured interview was used, sampling intended with 24 professors from Faculdade de Minas, in Belo Horizonte city, Minas Gerais. On the evaluation criterion of the research integrity, under the professor's guidance, were studied five indicators: plagiarism occurrence, inedited thematic, pertinent bibliographical review, need for approval by the Ethics Committee and funds destination. The results showed that 63 % of the professors, have found plagiarism in Course Work. The research pointed to the Course Work analysis of the integrity, validating more than one option for each participant, respectively, that 94 % have excelled in pertinent literature review, 75 % in the event of plagiarism, 44 % in need of approval by the Research Ethics Committee, 19 % in inedited thematic and 13 % in financial resources application. It is concluded that the ethical process and research integrity, requires a joint participation of the academic community for implementing continuous actions, integrated with new helping paradigms to the meaning of plagiarism. It's known the importance of pertinent literature review to the research integrity, however, it's suggested a more widespread discussion among researchers and coaches in the context of scientific production.

PT.44

Principles of geoethics and research integrity applied to the European Multidisciplinary Seafloor and Water Column Observatory (EMXO), a large-scale European environmental research infrastructure

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Geoethics deals with the ethical and social implications of research and practice in Geosciences, aiming at promoting integrity and honesty among geoscientists.

In this perspective, EMSO - European Multidisciplinary Seafloor and Water Column Observatory, a large scale European environmental Research Infrastructure, has included among its implementation the compliance to ethical principles in developing its research activity.

EMSO is a geographically distributed infrastructure, composed of several observatories deployed at key sites in European waters, with the basic scientific objective of real-time, long-term monitoring of environmental processes related to the interaction between the geosphere, biosphere and hydrosphere. EMSO is meant to contribute to face the grand scientific challenges related to the changes that the Earth System is undergoing such as those related to the climate change, the variability of ocean physical parameters and of oceanic circulation, and the geohazards.

For its evident socio-economic implications, the scientific activity in EMSO must consider aspects strictly connected to the issues of research integrity: 1) the huge amount of the produced data, to be managed with accuracy and foresight; 2) the involvement of many research teams from different countries and with different skills, that will have to work in a collaborative and respectful atmosphere.

So, an Ethics Committee is going to be established in EMSO with responsibility for overseeing the integrity in conducting the research and the key ethical and social aspects of the project.

These include:

- promoting science communication and data dissemination services to society;
- guaranteeing top quality scientific information and data;
- carrying out "Excellent Science" following strict criteria of research integrity;
- increasing the awareness of the importance to follow ethical principles among partners, in order to improve the relationships within the scientific teams and to assure the high quality of research products;
- developing education strategies in cooperation with academia and industry aimed at informing and sensitizing the general public on the environmental and socio-economic implications and benefits of large research infrastructure initiatives such as EMSO;
- promoting the increased adoption of eco-friendly, sustainable technologies through the dissemination of advanced scientific knowledge and best practices to the private sector and to policy makers;
- providing a constant and qualified reference point and advisory for politicians and decision-makers.

The case of EMSO may represent an useful example for other RIs and projects with great impact on the environment and society, aimed at carrying out "Excellent Science".

F1

Focus track on improving research systems: the role of funders

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Funders wield great power to influence the course of research and the way it is conducted. The goal of this Focus Track was to explore the ways in which the policies and practices of funders may promote or undermine responsible conduct of research, directly or indirectly.

The Co-Chairs of the sessions invited four panelists to make brief comments: Kevin Moses of the Wellcome Trust (UK); David J. Gallacher and Anja Gilis of Janssen Research and Development (Belgium); and Jane Jacobs of the Queensland University of Technology (Australia). To frame the discussion, the Co-Chairs and commentators addressed the broad topic from the perspective of private, public and not-for-profit funders of research, as well as that of funding recipients, specifically academic institutions and researchers. This diversity of perspective was reflected in the participants as well (roughly 40 at each session).

Over the course of the two sessions, participants considered how the policies and practices of funders may have an impact on responsible conduct of research (RCR). Initial comments pointed to ways in which funders attempt to promote RCR, for example through establishing RCR policies as a condition of funding and imposing penalties for breach of those policies. Funders may also investigate or require the investigation of allegations that researchers have contravened these policies. They may therefore act as both standard-setters and enforcers of RCR. Funders may also create educational resources, or provide training opportunities.

Discussion turned towards pointing out ways in which the practices of funders may fail to promote RCR, and may in fact actually create barriers to RCR. The discussion then turned to suggestions for improvement in how funding mechanisms operate, and how different actors in the research enterprise could play a role in encouraging RCR practices.

Concerns

Competition for funds

With funding opportunities becoming increasingly competitive, concern was expressed that the basis on which funders choose to award grants does not necessarily reward the most meritorious. Particular concern was expressed about the reliance placed on the number of publications a researcher has, and the impact factor of those publications. There was a sense that current funding mechanisms reward senior researchers, discourage innovation, and prioritize volume over the rigour of the research.

Reliance – or perceived reliance – by funders on impact factor may lead some researchers to put the most positive spin on data, and, in the worst cases, to falsify or fabricate data in order to show positive results and consequently, to increase chances of publication, further funding and consequently, future career success.

Lack of attention to reproducibility

Related to this criticism was the observation that there is a lack of opportunity to conduct replication studies, for a number of reasons: they do not tend to receive funding, they are not likely to be published and they receive little academic recognition. These are of course self-reinforcing. Funders could help to break the cycle, but other actors, such as academic institutions that employ researchers, also have a role to play.

Clarity of the process

Funders do not always make it sufficiently clear to academic institutions and applicants what they are looking for. This can lead to problems with the applications process, problems which funders may perceive as RCR issues. If researchers are to be held to a standard, that standard must be clear.

Implicit in these concerns was the sense that the pressures noted earlier may provide perverse incentives for researchers to ignore RCR, in order to improve their chances of success in securing funding.

Suggestions for improvement

The discussion turned to consideration of incentives that may produce improvements in RCR. If reproducibility is desirable as a measure of the rigour of a research study, funders should set aside a portion of their funds for replication studies. Another view expressed was that there need to be stronger negative consequences for authorship of irreproducible results.

Academic institutions could play a part as well, by allowing for more diversity in their considerations for tenure, for example, recognizing the importance of reproducibility studies, mentoring students, teaching students about the importance of integrity and traceability of data, or serving on research integrity panels.

Funders should be more willing to fund innovative research, and should place less reliance on the volume of publications and the concept of the impact factor. Funders can also promote RCR directly by making it clear (e.g. through conversations, contract language) that it is not only acceptable but desirable for researchers to let funders know when something appears to be wrong with the data, rather than try to cover it up or fabricate data. The concept of a hotline to a research sponsor was suggested in this context. There was a suggestion that private funders may in fact have something to teach public sector research bodies about rigour – it is at times the private sector which will conduct replication studies that uncover

problems with publicly funded research (e.g. see Begley & Ellis, *Nature*. 2012;483:531–533; Prinz F, Schlange T, Asadullah K. *Nat Rev Drug Discov*. 2011;10:712).

Conclusion

Because funders have a significant impact on what research is done, they can have a great impact on how research is done. The Focus Track session provided an opportunity for researchers and funders to have a frank discussion on some of the weaknesses in the funding process, and to explore some ideas about how the funding system can be modified to better encourage the responsible conduct of research. The main conclusion was that research needs to be made more transparent and this needs to be positively incentivized. However, current systems/culture are not always seen to be compatible with this idea and concerted efforts are needed to make effective changes.

F2

Focus track on improving research systems: the role of countries

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Two focus track sessions at the 4th World Conference on Research Integrity in Rio de Janeiro, Brazil, were dedicated to discussions on the usefulness, feasibility, and elements of a country report card in research integrity. Such a report card ideally should capture both elements of the research environment and system in a country and efforts to uphold and foster research integrity. The sessions were attended by representatives from the following countries: Austria, Brazil, China, Croatia, France, Germany, Ireland, Japan, Kenya, the Netherlands, Norway, Saudi Arabia, Singapore, Slovenia, Switzerland, UK, and USA. In the ensuing discussions the participants agreed that such a report card should not be used for ranking, grading, or as a mere tick-box exercise and it might have the inherent danger of disempowering countries that are at the beginning of discussions on research integrity and the research environment. By contrast, a report card could be useful for benchmarking, monitoring progress, comparing good practice, empowering those who want to strengthen research integrity, awareness raising, and might help to encourage research into what works to strengthen research systems. The group suggested an overarching framework for such a country report card in three parts: structures, processes, and outcomes.

Among suggestions for inclusion under structures were the following metrics and descriptors: the number of researchers and research institutions per population as a way to capture the demographics of the research community in a country; the amount of spending on research (as part of GNP) and the distribution of private, public and charity funding; whether a country has a scientific strategy; which national bodies and laws a country has with implications for research integrity (such as research ethics bodies, research integrity offices, national funding bodies, legislation on human and animal research; what is the organizational structure for research integrity and at what level is this (national vs institutional vs funder-led); the number of researchers and others involved in research integrity. To capture to structural elements of the research environment, suggestions were made to measure the percentage of postdoctoral students who get paid positions and the percentage of grant success for applications to national funders. It would also be helpful to capture the levels of hierarchy, the rules on mentoring and their application in practice, and whether there are any schemes involving role models. However, the exact ways of expressing these are less obvious.

Under processes, it was felt important to know: whether there is a national code of research conduct and how it is disseminated and enforced, and whether such a national policy has international influence; whether there is training and education in research integrity, whether it is mandatory and for whom, and by whom it is requested if so, and whether such training is evaluated and monitored; how and by whom investigations of alleged misconduct and undesirable conduct are done, and whether outcomes of proven misconduct is publicly available; what is the degree of cooperation between

institutions; whether there is protection of whistleblowers; whether there are designated research integrity officers in institutions, whether they are mandatory, and who educates them; whether there is research into research integrity and how much funding is there for it and who funds it; are there annual meetings on research integrity; and whether there is mandatory registration of clinical trials and other research and of results, and open and accessible data.

The outcome part of the report card was the most difficult aspect and there was some discussion and no finalised conclusion whether outcome means the status of research integrity in a country (as measured by an array of indicators) or the current efforts on achieving maximum research integrity and a conducive research environment, and what is the impact on the research ecology in a country. The possible areas to capture under outcomes discussed were the following: incentives for institutions or individuals or both based on research outputs, including research assessment frameworks and exercises; is research integrity part of institutional quality assessment; is there research impact assessment and translation of research findings to the community; what is the public's perception of research integrity in their country, is their trust in science; is research integrity discussed in the lay press; are there rewards for collaborative science and incentives for networks. It would also be good to be able to assess whether there are efforts to increase the value of research to society and reduce wasteful research.

The group's future aim is to start filling in some of this information for some key countries and then have a further discussion, possibly at the 5th World Conference on Research Integrity in Amsterdam in 2017. The question also arose whose responsibility it should be to produce and update such a report card at national level.

F3

Focus track on improving research systems: the role of institutions

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The theme of the 4th World Conference on Research Integrity was "Research Rewards and Integrity: Improving Systems to Promote Responsible Research." The Focus Tracks each took different approaches to this theme. In the two sessions of the Focus Track on the role of institutions, participants discussed steps that might be taken at the institutional level to improve the research system and its effects on research integrity. The institutions under consideration were universities, research institutions and other organizations where research is conducted.

In the first session, attendees discussed aspects of institutions that may compromise the integrity of research. These fell into the following five categories.

Research culture and institutional structure

Here, the most prominent feature discussed was competition, even referred to as "hypercompetition." Competition was seen as distorting reward systems and career paths, increasing the temptation to misbehave, and expanding unchecked through research systems worldwide. The participants emphasized that unfair competition, not competition overall, is the threat to integrity of research. Other factors that fell into this category were: overemphasis on academic careers and inadequate preparation for other careers, despite decreasing opportunities to pursue academic work; research cultures that do not permit open discussions but instead breed cover-ups;

unclear or self-contradictory rules, regulations and systems; and efforts to standardize or centralize control of research in ways that do not account for significant disciplinary differences in subjects and methods of research.

Inadequate structures and processes related to responsible conduct of research

Delegates mentioned lack of awareness of research integrity and associated problems, as well as inadequate training in responsible conduct of research and inadequate institutional responses to misconduct. In some research institutions, administrators are simply not aware of the possibility of research misbehavior until major cases of misconduct arise. Some countries have no system through which institutions are expected to report integrity problems and how they dealt with them. Participants also noted that many institutions have too few good role models in these areas.

Imbalance of demands and resources

Academic pressure, unrealistic demands, extremely high workloads, and an enormous financial urgency to perform and deliver results were seen as problem areas for research institutions worldwide. These pressures are particularly acute in the face of shortages of funding for research.

Difficulties with reward systems

Participants in this Focus Track discussed four types of problems related to reward systems, including specific perverse incentives. They additionally mentioned an over-emphasis on productivity or quantity at the expense of quality, performance criteria that are too narrow for research as it is done today, and the difficulties of rewarding collaborative work because systems are set up to recognize and reward individuals' effort and contributions.

Inequities in power and resources

Power inequities were discussed as contributors to lapses in integrity. Delegates mentioned that power differences may lead to situations in which junior researchers are exploited or feel forced to engage in questionable behavior. Strong hierarchical relations may give junior researchers a sense that they cannot call attention to inappropriate actions on the part of their superiors. Reluctance in institutions to intervene in other researchers' groups or laboratories supports such hierarchical dominance. This discussion also touched on differences between disciplines in research standards and disciplinary inequities in funding, which may contribute to a sense of unfairness within institutions.

The second session of the Focus Track was intended to solicit ideas on how to address the issues raised in the first session. Most of the discussion, however, focused on a further analysis of the problems themselves. The implicit reason for this focal point seems to be that a good understanding of the problem not only is a necessary condition for finding a solution, but also may also suggest what effective interventions might look like. Additionally it became clear that institutions' ability to address systemic problems is limited by forces that shape research globally. Few institutional leaders would be willing to risk their institutions' competitiveness by being the first to make changes in reward systems and other institutional arrangements. Nevertheless, a number of suggestions had to do with setting up collaborative systems for sharing resources and financial rewards. Some delegates advocated for mandatory intervention in others' research groups and projects when misconduct or other inappropriate behavior is suspected. Others emphasized the need to improve the role of senior faculty in teaching junior researchers about research integrity. Researchers who serve as adequate role models could also decrease the exploitation of junior faculty and teach others how to behave as members of the research community.