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Letter to the Editor

The strange case of Dr Jekyll and Mr Hyde (about surgery and basic research). A perspective for a new approach for pursuing an academic career (also in Italy)

Over the last two decades both the practice and the academic education in General Surgery underwent significant development in our country, however the most important changes were referred to the wide-spread use of the new technologies (e.g. the use of laparoscopy/robotic surgery).¹

After concluding the Medical School and the General Surgery Residency, the pathway for an academic career leads usually to a PhD course before applying for a university position; however, the choice of a PhD “laboratory-based” is quite uncommon, whereas is quite frequent in other Anglophone countries.

Moreover, we are nowadays facing remarkable changes in the academic system of our country, heading: a) to the designation of a rigorous track of the scientific and of the research productivity, b) to a dramatic change in the selection of academic personnel, and c) to readdress founts to high-productivity centers/researches^{2,3}; therefore, there might be the need of re-defining the educational path of young surgeons who choose to pursue the academic career.

On the basis of this background, we would like to debate on the possibility of conducting a basic-science PhD program as an approach for pursuing the academic career in surgery, highlighting the arguments for and opposite this controversial issue.

In the US the interruption of a residency in general surgery for a research fellowship program is common (up to 36% of the residents),⁴ conversely in Italy, the vast majority of surgeons devote their attitude *after* concluding the surgical training. Even though there is a lack of controlled data, those years are dedicated mostly to the clinical research and the selection of a program aimed to the basic/translational medicine is not a common option, even for those surgeons who choose to pursue an academic career.

Opposite the vast majority (72%) of the surgical resident researchers in the US are dedicated to the basic-sciences.⁴

The reasons behind the choice of avoiding basic-science programs could be the perspective of a long training, the compliance with the programs and the lack of practice.⁵

However, surgical residents who perform at least 2 years of research are more likely to become academicians than residents who do 1 year or less.⁶

Indeed the vast majority the professors of surgery in the US performed a basic-science research during the training perceiving it as adequate for the development of academic surgeons.⁷

Special attention should be paid to the definition of the different types of research programs before applying for a particular one:

“basic research is performed without thought of the practical ends” whereas “the function of applied research is to provide complete answers to the practical problems”.⁸ Opposite clinical research has been defined as one of the following: a) a patient-oriented research; b) epidemiologic study and c) outcomes/health service research,⁹ whereas “translational” has been defined as a kind of research that transfers knowledge from basic to clinical research in a first stage and therefore transfers findings from clinical studies to practice settings.

Indeed the involvement of young surgeons in translational researches is a key element in training academic leaders, as long as faculties encourage meaningful surgical researches.¹⁰

The definition of an “academic surgeon” could be not unique: if a “busy clinical surgeon” devotes <15% of his time in non-clinical activities (e.g. teaching), a “clinical investigator/research” spends 20–30% of his time working on trials; a “surgical educator” dedicates 20–40% of his working hours to the education and a “surgical scientist” devotes >60% of his time to basic research.¹¹

This differentiation might be useful for defining a prospective role for academic surgeons and for differentiating the efforts and goals of the equipe.

O’Sullivan identified 5 issues that correlate with becoming an academic doctor including: the early exposure to research, the role of mentors, the career pathways, the role of personal/social factors and the supporting role of junior faculty members.¹²

Furthermore the decision to spend some time in a laboratory setting does not necessary mean a straight commitment to an academic career, but might provide the opportunity of developing new analytical skills under the influence of a proper mentor.¹³

Indeed the length of the full-time research program of the surgical residents correlates positively with research productivity (number of authored papers) and both are predictive of success in obtaining the funds.^{4,14} Nevertheless, past studies documented that when new investigators apply for grants, surgeons are significantly less successful in achieving the founding than non-surgeons¹⁵; therefore the academic departments should recruit researchers or clinicians-scientists who can successively compete for larger grants (in order to increase the funds), investing in individuals committed to the research.¹⁶

Indeed also in Italy the research productivity (measured with the impact factor, *h* index etc.) is the *core* of the academic curriculum and it’s the key element for achieving the founts, both from public and private sources (e.g. Italian Association for Cancer

Research recommends an impact factor >50 even for scientist younger than 35 years applying for their grants).¹⁷

On the basis of what has been discussed herein, we auspicate that more basic research/translational research programs would be incorporate in the curriculum of young surgeons who choose to pursue an academic career. This could be a strategy for improve the founding and for enriching the skills of young surgeons. A “Dr Jekyll vs Mr Hyde” model is nowadays obsolete and the research years might be an opportunity for developing new abilities without any “split of personality”: an academic surgeon should no longer considered exclusively a technician in the operating theatre (a sort of Dr Jekyll) *hiding* a research capacity, but the two processes might be the part of an unique path.

We thus believe that the research years might be a “vulnerable stage”⁵ for young surgeons, however there are several factors for encouraging surgeons in choosing a basic-sciences/translational research program, including the possibility of: a) authoring a greater number of papers increasing the individual's and the department's impact factor, b) being more competitive when applying for grants, c) establishing collaboration with other departments and d) achieving new skills.

Declaration of interest

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Ethical approval

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Author contribution

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References

1. Angelini L, Eleuteri E, Coppola M. Surgery in Italy. *Arch Surg* 2001;**136**(11): 1318–22.
2. Peterlini M. When in Rome, reform. Radical reform of the Italian research and education system is needed to address the lack of autonomy and lack of funding. *EMBO Rep* 2009;**10**:128–31.
3. Bifulco M, Santoro A. Comment on “Whenin Rome, reform”. *EMBO Rep* 2009;**10**:296.
4. Robertson CM, Klingensmith ME, Coopersmith CM. Prevalence and cost of full-time research fellowships during general surgery residency: a national survey. *Ann Surg* 2009;**249**(1):155–61.
5. Sue GR, Bucholz EM, Yeo H, Roman SA, Jones A, Bell Jr RH, et al. The vulnerable stage of dedicated research years of general surgery residency: results of a national survey. *Arch Surg* 2011;**146**(6):653–8.
6. Thakur A, Thakur V, Fonkalsrud EW, Singh S, Buchmiller TL. The out come of research training during surgical residency. *J Surg Res* 2000;**90**:10–2.
7. Ko CY, Whang EE, Longmire WP, McFadden DW. Improving the surgeon's participation in research: is it a problem of training or priority? *J Surg Res* 2000;**91**:5–8.
8. Bush V. Section 3 (The importance of basic research), Chapter 3 (Science and the public welfare). In: *Science: the Endless Frontier – A Report to the President by Vannevar Bush, Director of the Office of scientific research and development*. Washington, DC: United States Government Printing Office. Available at: http://www.nsf.gov/about/history/nsf50/vbush1945_content.jsp; July 1945.
9. Clinical research. In: Glossary of Terms for Human Subjects Protection and Inclusion Issues. Available at: <http://grants.nih.gov/grants/glossary.htm>.
10. Krajewski A, Chandawarkar RY. Pasteur's quadrant: preparing training programs for “used-inspired” surgical research. *J Surg Educ* 2008;**65**:283–8.
11. Staveley-O'Carroll K, Pan M, Meier A, Han D, McFadden D, Souba W. Developing the young academic surgeon. *J Surg Res* 2004;**118**:109–13.
12. O'Sullivan PS, Niehaus B, Lockspiser TM, Irby DM. Becoming an academic doctor: perceptions of scholarly careers. *Med Educ* 2009;**43**:335–41.
13. Gabram SG, Espat NJ, Jacobs LM, Macleod JBA, Rozycki GS. Academic Careers in Surgery: the many paths from which to choose. *J Surg Educ* 2007;**64**:27–35.
14. Robertson CM, Klingensmith ME, Coopersmith CM. Long-term outcomes of performing a postdoctoral research fellowship during general surgery residency. *Ann Surg* 2007;**245**(4):516–23.
15. Rangel SJ, Moss RL. Recent trends in the founding and utilization of NIH career development awards by surgical faculty. *Surgery* 2004;**136**:232–9.
16. Shah A, Pietrobon R, Cook C, Sheth NP, Nguyen L, Guo L, et al. Little science, big science: strategies for research portfolio selection in academic surgery departments. *Ann Surg* 2007;**246**(6):1110–5.
17. Associazione Italiana per la Ricerca sul Cancro, AIRC; Web site. <http://www.airc.it/>

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