# VRG PROGRAM EVALUATION 2021

## SELF-EVALUATION REPORT BY WWTF OFFICE

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Imprint

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First version, 01/2022

WWTF Vienna Science and Technology Fund

# Self-evaluation report
# VRG Program Evaluation 2021

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„The VRG program shall serve two goals: to bring top young talent to Vienna and to facilitate stepwise institutional change.”

**Michael Stampfer**
WWTF Managing Director

„As a funding organisation, we see our role as a partner for the researchers, accompanying them in their journey and career steps.”

**Donia Lasinger**
WWTF Deputy Managing Director
VRG program manager

# Introduction and guide for the reader

The following self-evaluation report contains information about the VRG program. An overview of the structure and content of the document is provided below.

This report is divided into three main sections: **I. WWTF in a nutshell** provides details about WWTF as an organisation (1.), the funding portfolio as a whole (2.), details about the financial structure (3.) and evaluation procedures (4.). Moreover, the context in which the WWTF is embedded at an international, national and city level will be briefly described (5.).

The next section **II. The Vienna Research Groups program** provides information about the specific program that is the subject of this evaluation. It depicts the background and history of its beginning (1.), how it is incorporated in the WWTF portfolio (2.) and its context (3.), with specific view to the research landscape in Vienna. Details are then presented about the goals of the program (4.), its selection procedures (5.) and the status quo in numbers and figures (6.). This part concludes with the major changes that have been implemented through the lifetime of the program and the context in which these changes were necessitated (7.1), especially with respect to changes in the legal framework of career development in Austria, other changes of the program (7.2.), and previous evaluations and lessons learned (7.3.). Furthermore, impact of the program besides outputs (depicted in commissioned studies) (8.), such as career development (8.1.) or success in obtaining grants (8.2.) of the funded VRG leaders will be shown.

The third section **III. Self-assessment WWTF office** offers a critical inside view of the program, particularly regarding the fulfilment of the program goals (1.), its process (2.), social, (3.) financial (4.) and gender (5.) aspects, as well as the role of stakeholders such as the City of Vienna or other proponents (6.). It concludes with insights from the managing director and the VRG program manager (7.).

The report concludes with an outlook of the program (**IV. Outlook**), followed by more details in the references (**V. References**) and appendices (**VI. Annex**).

**Accompanying Research by AIT and KU Leuven**

**Report by International Review Panel**

# Purpose of the self-evaluation report

This document serves as an input for the 2021 evaluation of WWTF's *Vienna Research Groups for Young Investigators* (VRG) program by an international review panel. The VRG program has been financed by the City of Vienna and implemented by the Vienna Science and Technology Fund (WWTF) since 2010.

The program's goal is to attract excellent young researchers (in general 2—8 years after PhD) to Vienna to build up their own group and to foster their research career. Since the launch of the program, 24 such group leaders have been appointed and funded with approximately € 1.6 m each for 6—8 years.

The document has been prepared by the WWTF office for the review panel, with the principal aim to inform the panel about WWTF from its own perspective. Thus, it contains mostly facts about us and our funding, but also some insights into how we see our work. This evaluation is the first comprehensive review of the VRG program.

WWTF was subject to an organisation-wide evaluation in 2008 [1] and an impact evaluation in 2014/2013 [2], the latter of which covered the impact of VRG in its early stages. The framework for this 2021 self-evaluation report is described in the Terms of References for the Review Panel (see V. References). The main goal for the current exercise is to assess outcomes and processes of the VRG program.

This document should be read in the context of further supporting material, in particular a bibliometric and comparative study, as well as an online survey undertaken by the Austrian Institute of Technology, supported by KU Leuven. This additional material is also available. In particular, interviews were conducted by members of the review panel during their site visit on October 14—15, 2021.

This document seeks to provide concise information about WWTF as an organisation and its activities, with focus on one of its programs in the context of the Austrian and Viennese research landscape. A self-assessment of WWTF is also included as part of this report.

# I. WWTF in a nutshell

Since its beginning, WWTF's mission has been to strengthen Vienna's research excellence. This main mission to fund research in Vienna has remained at the heart of WWTF's activities since they started almost 20 years ago in 2022.

Our goal is to strengthen **Vienna as a location of excellent research by funding projects and persons**. In general, research funding in Austria is heavily directed towards industrial needs, be it direct subsidies, tax breaks or incentives for collaboration between industry and science. Scientific research, however, lacks sufficient funding. This is one principal reason why WWTF as a **niche player** concentrates on supporting top class research in universities and research organisations, serving communities that have shown impressive qualitative growth over the last decades. Through this form of funding, we help to lay career foundations for top graduates, as well as excellent academic cooperation partners for industry.

## 1. WWTF's organisational structure

WWTF is a **private, non-for-profit fund**. Hence, WWTF is not an agency of the municipal administration and thus **independent in its activities**. WWTF was **founded in 2001** by two individuals and a banking foundation, the "Stiftung zur Verwaltung von Anteilsrechten".


The latter has stipulated to donate two-third of its annual profits to WWTF. The annual transfer from the foundation forms the main source of income of WWTF.

(1) The **Board of Directors** ("Vorstand") is composed of six members. As the **final decision-making body of WWTF**, its main tasks are to define the overall strategy, lay down funding guidelines, adopt thematic programs, approve applications for funding and to settle organisational, administrative and financial issues. As the VRG program is financed by the City of Vienna, the VRG program lies solely in the responsibility of the Board of Directors, with the Advisory Board playing only a minor consulting role.

(2) The **Advisory Board** ("Kuratorium") is composed of 26 members. About two-third are academics working in Vienna, most of whom were nominated by the six local scientific universities. The other members are delegates from the Viennese local parliament, social partners and municipal administration. Its main task is to **provide advice to the Board of Directors in strategic and funding matters** and other relevant issues.

(3) **WWTF office** is responsible for the fund's on-going management and operation. It includes the preparation and management of calls, the administration of ongoing projects, the execution of quality assurance and controlling instruments of all WWTF funding activities, the communication and interaction with funded persons and institutions as well as with other relevant stakeholders, and the administration of the fund itself. Currently, WWTF office employs around ten people. WWTF office also provides consultancy via its 100 % subsidiary WWTF GmbH[1].

[1] The latter has no own staff and has been founded due to tax reasons as WWTF is itself a non-profit organisation. See wwtf.at for a list of persons in the abovmentioned bodies.

# 2. WWTF's funding portfolio

Potential applicants to WWTF's programs are Viennese institutions whose main purpose is the conduct of research: public and private universities, non-university public research institutions and non-for-profit private research institutions.

For-profit companies can be involved as project partners but are not eligible for funding from WWTF. Based on WWTF's central mission of strengthening Vienna's research capacities, non-Viennese institutions are not eligible as principal beneficiaries of WWTF funding; however, they may apply for a defined share of project budget as partners of Viennese institutions.

The funding work is regulated by WWTF's funding guideline [3]. WWTF's funding activities are organised along funding instruments and thematic priorities. The focus of funding is to **strengthen existing research capabilities in the context of Vienna,** to **foster interdisciplinarity and the career prospects of younger researchers**.

## 2.1 Thematic priorities

Due to its niche function and limited resources, a central characteristic of WWTF funding activities is that they are carried out **within thematic priorities and via time limited calls**. WWTF has a dedicated strategy to determine how topics are evaluated (see section on evaluation below) and selected.

Considerable preparation work precedes the selection of new topics, and includes field research, interviews, and discussion with the boards. Currently, WWTF issues calls in four different areas: Life Sciences, Information- and Communication Technology, Cognitive Sciences, and Environmental Systems Research (see table 1).

(1) **Life Sciences** (LS) was the first thematic priority for which WWTF issued a call. This area is one of the principal and traditional strengths in the research landscape in Vienna. Due to the breadth of this area, each call is characterised by a specific focus (e.g., "Imaging", "Precision Medicine", "Chemical Biology", etc.).

(2) The **Mathematics and …** (MA) program dates back to 2004 and was WWTF's second thematic priority. The program required involvement of a partner from another discipline and thus focused on interdisciplinary modelling. It was successfully concluded in 2017 following an evaluation of all thematic priorities.

**Table 1: WWTF thematic priorities and runtime**

| | |
|---|---|
| Life Sciences | 2003—today |
| Science for Creative Industries | 2004—2006 |
| Mathematics *and* … | 2004—2017 |
| Social Sciences and Humanities | 2008—2013 |
| Information and Communication Technology | 2008—today |
| Cognitive Sciences | 2012—today |
| Environmental Systems Research | 2017—today |

Life Sciences (LS), Science for Creative Industries (CI), Mathematics and … (MA), Social Sciences and Humanities (SSH), Information and Communication Technology (ICT), Cognitive Sciences (CS), Environmental Systems Research (ESR)

(3) It was superseded by the thematic priority **Environmental Systems Research** (ESR) which focuses on cities and the multitude of their effects.

(4) The thematic priority **Information and Communication Technology** (ICT) was introduced in 2008 and seeks to reinforce the strong position of ICTs in Vienna through more fundamental research projects. While the applied side of ICT is abundantly covered by both national and supranational funding, a clear lack of funding of more basic research-oriented projects in the ICTs had been identified. The program focuses on addressing substantial scientific research questions that have mid-term, rather than immediate, social and economic benefits.

(5) **Science for Creative Industries** (CI) was followed by its successor **Cognitive Sciences** (CS), which encompassed cognitive processes in humans, animals and machines.

(6) The program **Social Sciences and Humanities in Vienna** was not funded through WWTF's own capital but through the financial resources of the City of Vienna. This program was ended in 2013 with the discontinuation of municipal funding.

**WWTF is committed to its funding areas over the long term**, as reflected in the process by which thematic areas are selected.

Current thematic areas are evaluated on a regular basis and subsequently terminated, adapted, or newly installed. Since the first call in 2003, 51 calls with 312 funded proposals have taken place (see table 2), including 12 VRG calls (with the currently running call VRG21), and including smaller funding schemes such as supplementary measures.

**Table 2: Overview of all calls**

| | LS | MA | CI/CS | SSH | ICT | ESR |
|---|---|---|---|---|---|---|
| **2003** | PRO | | | | | |
| **2004** | SC | PRO | PRO (CI) | | | |
| **2005** | PRO | | | | | |
| **2006** | | SC | PRO (CI) | | | |
| **2007** | PRO | PRO | | | | |
| **2008** | SC | | SC (CI) | PRO | PRO | |
| **2009** | PRO | PRO | | PRO | | |
| **2010** | VRG | SC | | PRO | PRO | |
| **2011** | PRO | | PRO (CS) | PRO | VRG | |
| **2012** | PRO | VRG | | | PRO | |
| **2013** | PRO | | VRG (CS) | PRO | | |
| **2014** | PRO+VRG | PRO | | | | |
| **2015** | VRG | | PRO (CS) | | PRO | |
| **2016** | PRO | PRO | | PRO | VRG | |
| **2017** | PRO | VRG | | | | PRO |
| **2018** | PRO | | PRO (CS) | | VRG | |
| **2019** | PRO | | | | PRO+VRG | |
| **2020** | PRO+VRG | | | | PRO | PRO |
| **2021** | PRO | | VRG (CS) | | | |

Caption: PRO … Project; SC … Science Chair; VRG … Vienna Research Groups for Young Investigators

## 2.2. Instruments

WWTF employs **three instruments to fund research**: projects, person-oriented funding, and supplementary measures.

(1) Major **research projects (PRO)** usually involve a team of researchers led by a more experienced principal investigator. Projects seek to address a specific research question over a 2—4 year timeframe. They are guided by a research plan which is evaluated *ex ante*. The funding budget lies between € 200,000 and € 1 m. The main funding criteria for research projects are the scientific excellence of the applicants and the innovativeness and quality of the planned research.

(2) **Person-oriented funding** comes mainly via Vienna Research Groups for Young Investigators program (Science Chairs are no longer funded) **(VRG**). The main selection criteria in person-oriented funding are the scientific excellence of the candidate, as well as his/her potential and strategy to embed the new team into the existing research environment of the host institution in Vienna.

(3) The funding portfolio is supplemented by a smaller and more flexible form of funding called **supporting instrument**. This may cover activities such as summer schools, smaller projects, and dedicated activities (gender mainstreaming, transfer projects, COVID Rapid Response Call) with a budget of up to € 50,000.

# 3. Financial structure

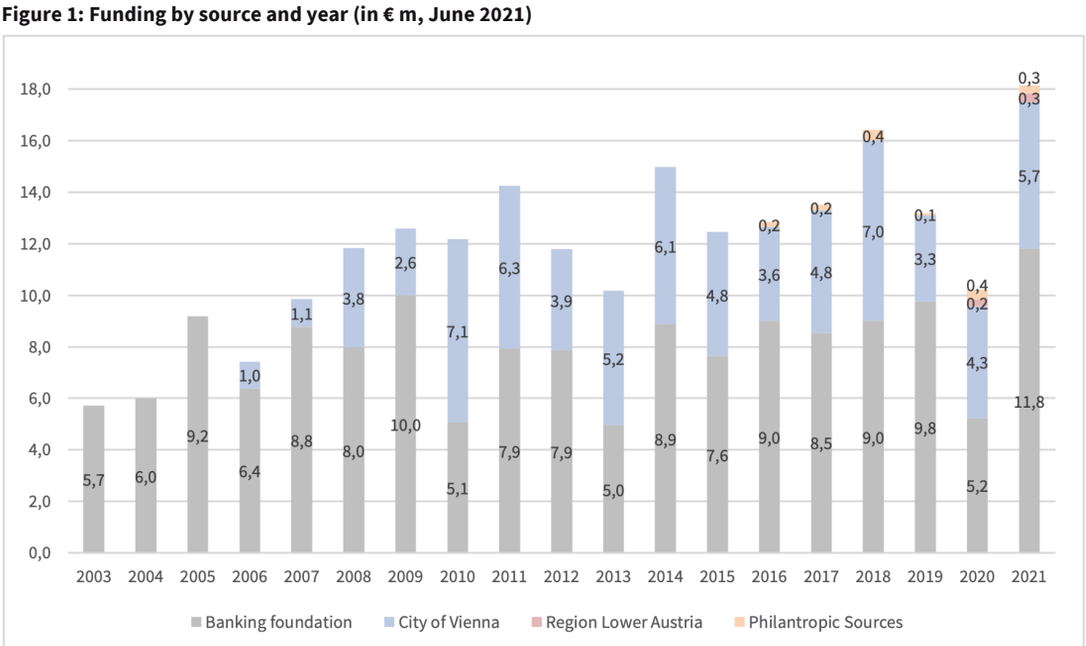
**Four financial sources** underpin WWTF's funding activities:

(1) Annual funds from a private **foundation** ("Privatstiftung zur Verwaltung von Anteilsrechten"). This represents the core of WWTF's funding and constitutes its identity as a private actor.

(2) Programs managed by WWTF on behalf of the **City of Vienna**, e.g., the Vienna Research Groups for Young Investigators, and the University Infrastructure Program.[2]

[2] https://www.wwtf.at/programmes/university_infrastructure/index.php?/lang=EN

**Figure 1: Funding by source and year (in € m, June 2021)**



(3) Ongoing **collaboration between the WWTF and the region of Lower Austria** in joint projects.

(4) **Fundraising** activities to actively secure financial support from private parties, which are then matched accordingly by public money from the City of Vienna ("Matching Funds").

**Between 2003—2021, WWTF provided a total of € 222.1 m** for the funding of research and researchers (including the currently open calls LS 2021 and VRG 2021) up until now, of which **€ 39 m was dedicated to the VRG program** (including the VRG 2021) call). In recent years, WWTF has seen growth of income in all four of its financial sources. Currently WWTF's **annual budget approaches € 15 m**.

The accumulated funding comes from different sources: € 149.8 m come from the private banking foundation, € 70.8 m from the City of Vienna, € 1.6 m from philanthropic sources and € 0.6 from Lower Austria (see figure 1 on page 10, in total).

## 4. WWTF's system of quality assurance

Quality assurance has been an essential part of WWTF's funding activities since its beginning, and pertains to subjects of funding, funding instruments and the organisation itself. The evaluation concept dates back to 2004 and has been adopted and developed further (last modified in 2011). **International peer review and international jury processes** are at the core of quality assurance measures. The **quality assurance matrix** considers both the dimension of time (*ex-ante* / *interim* / *ex post*) and different organisational levels of WWTF (see table 3).

(1) Quality assurance at the level of **funded cases** (e.g., projects, person-oriented funding, summer schools, etc.): typically covers the "life cycle" of projects and person-oriented funding cases. *Ex ante* evaluations within competitive calls include a rigorous selection process that focuses on the quality of the applications through the involvement of an international jury and reviewers. Interim quality assurance includes annual reporting on the progress of the project, financial monitoring and the reporting of outcomes and outputs, such as publications, new cooperation links, career steps, industrial outreach and public outreach.

**Table 3: WWTF quality assurance matrix**

| Time / Level | Ex-ante | Interim | Ex-post |
|---|---|---|---|
| **Funding cases** | International peer review (and) international expert juries | — Annual reporting & monitoring<br>— Site visits<br>— "Escalation scenario" for outliers (performance; non-compliance) | Output/outcome evaluation (reviews, experts) and public presentation of project results |
| **Instruments** | Strategy process 2002<br>Process evaluation 2008 | Process evaluation 2008<br>**VRG programme evaluation 2021** | |
| **Institutions** | Strategy process 2002 | Process evaluation 2008<br>Impact evaluation 2013 | |

*Ex post* evaluation of WWTF-funded activities are performed on a regular basis but are not obligatory for all calls. Peer review is again conducted to assess the quality of the project's outcomes and to provide informed feedback to the project coordinators in a setting that may also be open to the public.

(2) Quality assurance at the level of **instruments**: goes beyond individual funding cases and aims to assess the fit and adequacy of the chosen instrument to reach the aims of the fund and/or to assess the effects and impacts of the instrument. **This level forms the entry point for the VRG program evaluation 2021.**

(3) Quality assurance at the level of the **institution**: takes place over longer periods and is aimed at processes, program priorities, administration, and impacts. These exercises target institutional learning processes to change and improve the institution's performance with respect to organisational structure, management, priorities, and financing. In 2008, WWTF's processes and instruments underwent evaluation, while its impacts were evaluated in 2014.

The VRG funding guideline [4] foresees an **external evaluation of the whole program after three calls** (i.e., after the end of funding of the program's first three cohorts), which occurs in 2021.[4] The program has not been evaluated specifically to date but was part of the WWTF's 2013/2014 comprehensive impact evaluation, which included a detailed study of selected case studies [2 and 5].[5] The major outcomes of this evaluation are discussed in "II. The Vienna Research Groups Program".

[4] Goals and details of the evaluation are described in the "Terms of Reference for the International Review Panel" [6].

[5] The documents of this evaluation are publicly available on the WWTF webpage (www.wwtf.at)

# 5. WWTF in context

## 5.1. European level

Austria is a wealthy country, with a level of GDP per capita well above the OECD average; it ranks fourth in the EU-28, in a group of countries such as Germany, Sweden, the Netherlands and Denmark. As a location for R&D, Austria has shown dynamic development in recent years. In 2019, R&D expenditures increased to € 12.69, which corresponds to approximately 3.18 % of gross domestic product (GDP). As part of the Federal R&D strategy, Austria **aims to become an "innovation leader" by 2030** (see Innovation Union Scoreboard 2020[6] and Republik Österreich 2030[7]). Currently, however, Austria ranks 8th in the Innovation Union Scoreboard ("Strong Innovators").

## 5.2. National level

In 2020, the Austrian federal government spent around € 3.33 bn on R&D, which corresponds to around a quarter (27.4 %) of all R&D carried out in Austria. With the nine federal states dedicating an additional € 0.55 bn (4.5 %) to R&D, the total public sector in Austria accounted for € 3.88 bn of its R&D expenditures.

Domestic companies financed almost half (41.4 %) of all R&D expenditures with € 5.03 bn. Proportionally, this represents a slight decrease from recent years (2019: 46.4 % 2018: 47.1 %; 2017: 49.0 %).

€ 2.00 bn, or 16.5 %, was funded from abroad; this amount is largely comprised of R&D funded by foreign companies for their domestic subsidiaries and returns from EU research programs. The research premium accounted for € 1.048,5 bn in 2019, or 8.6 % of R&D spending. Other public funding and the private non-profit sector played relatively minor roles, together accounting for 1.52 % [8].

The Austrian research landscape is characterised by 22 public universities, 21 universities of applied sciences, five central non-university research institutions, 3,489 researching companies, and a total of 5,084 research-performing units, including many leading international companies. **The Austrian Higher Education (HE) sector shows more (and often smaller) institutions than those in other comparable countries like Netherlands, Switzerland or Denmark.**

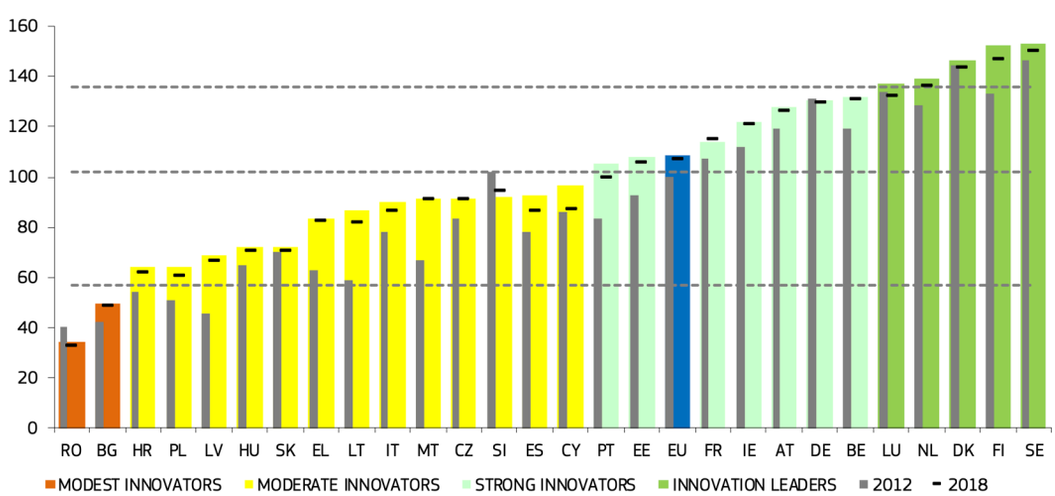
Within the last ten, twenty years Austria underwent a "catching-up process" in almost all areas of research. In some areas (life sciences, quantum physics, amongst others), a handful of institutions have established themselves as leading organisations on the global stage.

[6] https://ec.europa.eu/docsroom/documents/42981

[7] https://www.bundeskanzleramt.gv.at/dam/jcr:1683d201-f973-4405-8b40-39dded2c8be3/FTI_strategie.pdf

[8] Please note that sources are mentioned only for tables / figures not made by WWTF office

**Figure 2: Ranking EC Innovation Scoreboard 2020**




**Source: European Commission 2020.** [7] [8]

This development is closely connected to institutional reforms triggered by a new University Law in 2002 and subsequent implementation in the following years. Universities have become more independent from the Federal Ministry of Education, Science and Research, and can make autonomous decisions in research and teaching. In the previous decade, these reforms further contributed to the dynamic development of Austrian research that had already started well before the 2000s [9].

[9] https://www.fwf.ac.at/de/news-presse/news/nachricht/nid/20210427-2646?tx_rsmnews_detail%5Bref%5D=l&cHash=0d4cc1e3be5163deedf73d9b50677998

**In Austria, national R&D funding is predominantly operated by two large agencies.**

(1) The **Austrian Science Fund (FWF)** is responsible for the financial support of basic research (predominantly endowed by the Federal Ministry of Education, Science and Research, which approved ~ € 243 m of funding in 2020[9]) and

(2) the **Austrian Research Promotion Agency (FFG)** is responsible for funding applied R&D projects (predominantly endowed by the Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology and the Federal Ministry for Digitalization and Economic Location, which approved ~ € 773 m of funding in 2019) [11].

**Table 4: R&D key figures for Vienna and Austria (2017)**

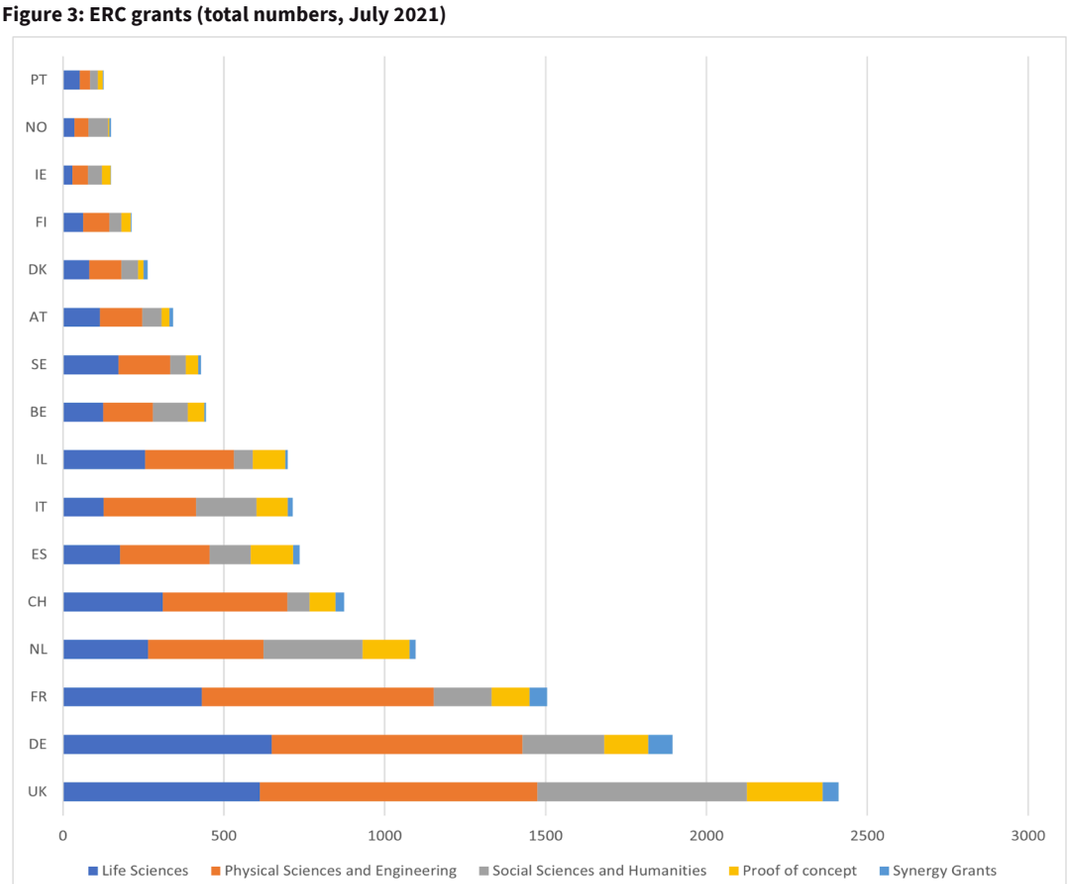
| | | Vienna | Austria |
|---|---|---|---|
| Population (2020) | | 1.9 m | 8.9 m |
| R&D quota (as of % of GDP) (2017) | | 21.3 % of AT | 100 % |
| | | 3.60 % | 3.05 % |
| R&D units (public and private, 2017): | | 1,560 | 5,084 |
| | | 30.7 % of AT | 100 % |
| Overall R&D expenditures (2017) | | € 3,562,496,000 | € 11,095,231,000 |
| | thereof business sector | 32.1 % of AT<br>1,490,812,000<br>24.2 % of AT | 100 %<br>6,170,303,000<br>100 % |
| | **thereof public sector** | **1,523,130,000<br>48.9 % of AT** | **3,117,773,000<br>100 %** |
| | **thereof higher education sector** | **48,321,000<br>54.6 %** | **88,450,000<br>100 %** |
| | thereof private-non-profit sector | 23,883,000<br>61.3 % of AT | 38,987,000<br>100 % |
| | thereof from foreign institutions incl. EU and multinationals | 540,923,000<br>28.9 % of AT | 1,874,268,000<br>100 % |
| **Expenditures basic research (2017)** | | **€ 918,511,000<br>46.3 % of AT** | € 1,982,578,000<br>100 % |
| Expenditures applied research (2017) | | € 1,205,232,000<br>32.4 % of AT | € 3,716,344,000<br>100 % |
| Expenditures experimental development | | € 1,438,753,000<br>26.6 % of A | € 5,396,309,000<br>100 % |

Source: Statistik Austria [10]

**This means the budget for funding applied R&D projects is three times larger than the budget for funding basic research.** Vienna obtained far more FWF grant money than the rest of Austria and now receives 62 % of all FWF funding (2020) [12]. In total, 46.3 % of all expenditures provided for basic research in Austria are directed to Viennese research institutions.

Since the start of the ERC funding, "Austria" (that is, researchers working at Austrian institutions) has received 313 grants from the European Research Council (see figure 3). In comparison to the population, Austria receives 38,5 ERC grants per 1 m inhabitants (see figure 4 on page 16) and ranks in the upper middle of European countries.

**Figure 3: ERC grants (total numbers, July 2021)**



**Local research development in Vienna reflects the dynamic national trend.**
Indeed, in some areas, development in Vienna has been even stronger than in the rest of Austria. As apparent from table 4, in Vienna, the number of R&D units relative to the population is significantly higher than the Austrian average, as is the share of overall R&D expenditures. Out of the 313 ERC grants for Austria, 196 of them went to Viennese institutions, that is around 63 % (see figure 5). For more information see table 6 in Chapter 4 “VRG in context”.

**As a private actor, WWTF is by far the largest regional funding organisation of its kind in Austria, investing in scientific research and acting in a niche.**

**Figure 4: ERC grants (per 1 m population, July 2021)**

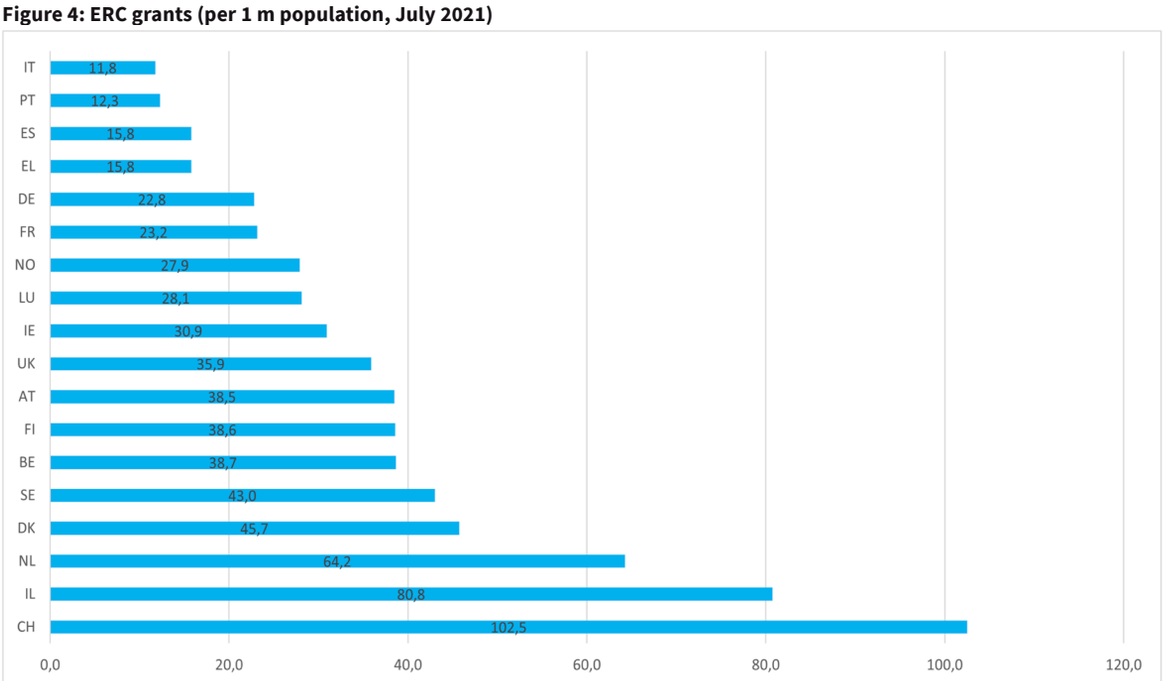
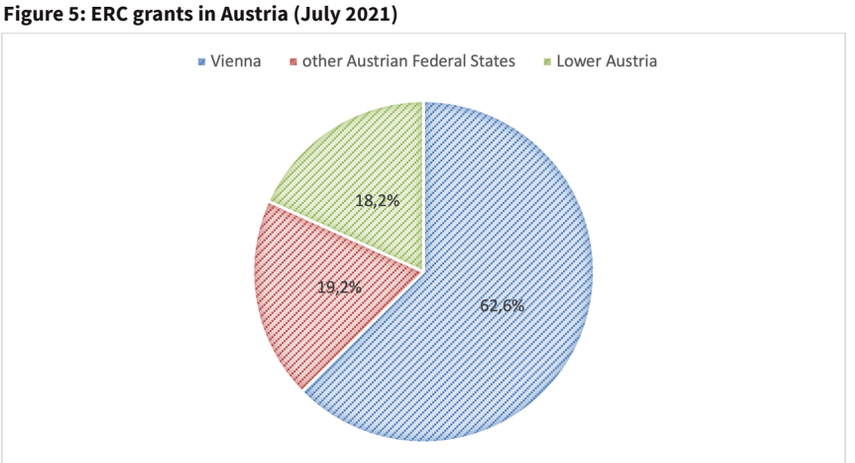



**Figure 5: ERC grants in Austria (July 2021)**



# II. The Vienna Research Groups Program

The subject of this evaluation is the program Vienna Research Groups for Young Investigators (VRG). Its aim is to attract talented researchers from abroad and to embed them in Vienna host institutions, to provide them with substantial means to conduct excellent research, and to allow them to pursue an academic career.

The VRG program is aimed at researchers from abroad who are in the early stages of their career. WWTF deliberately targets very young researchers as candidates (about **two to eight years post-PhD**), as we believe that talent should be encouraged and a clear career impulse be given early.

VRG leaders receive **funding of up to € 1.6 m per group for six to eight years,** thus allowing them to build their first "genuine" research group at the Vienna host institution. VRG leaders should establish and supervise their research group, teach students, be involved in further faculty activities, raise additional third-party funding, and build research collaborations both locally and internationally.

VRG leaders are completely independent in the design and conduct of their research and in the recruitment of their staff. **Host institutions provide upfront clearly defined career plans leading to a tenured academic position** ("associate professor"). Calls are issued annually in one WWTF's funding thematic priorities.

## 1. Background of the VRG program

The VRG program was launched in 2010, following its conceptual development in the 2007 Vienna innovation strategy *Wien denkt Zukunft (Vienna thinks future)*[10]. The program has been **fully financed by the City of Vienna and operated by WWTF since 2010**.

The VRG program funds an average of two persons per year. To date, a total of **23 VRG group leaders** have been brought to Vienna through **eleven calls** (12th call in 2021 is currently running). The program's rules and procedures are regulated in the separate VRG funding guidelines [4] and application documents.

## 2. WWTF portfolio and the VRG program

The **VRG program is embedded in the portfolio of the WWTF**. The WWTF board of directors approve the topic of each VRG call, taking into consideration all potential topics. The scientific landscape is continuously monitored, and interviews are conducted with scientists and the management of Viennese institutions on a regular basis in order to identify new developments.

[10] Stadt Wien. 2007. Wien denkt Zukunft. Wissen schafft Innovation. Wiener Strategie für Forschung, Technologie und Innovation.

Clear links exist between the different instruments and thematic priorities of WWTF. Firstly, the VRG program **is run within a thematic priority** of WWTF and has a different focus each year. Secondly, selection of thematic priorities always take into consideration **other current calls**, i.e. calls should be mutually complementary. Thirdly, topics are chosen according to the **needs of the scientific community** and field in Vienna.

Questions to be asked and **examples** of how they have been addressed are highlighted below:

(1) If the topic is **new**: **Are there sufficient Viennese host institutions and researchers to ensure a competitive call?**

— In designing the first call in the VRG program in 2009, the topic Life Sciences (LS) was selected by the WWTF board of directors as the topic was already established and well known to WWTF due to other project calls.[11]

— In the following year, the topic ICT was chosen for VRG 2011, as it was deemed to be an emerging field in Vienna (as exemplified through two WWTF project calls in 2008 and 2010 with a total of € 10 m and numerous new professorships)[12].

— In 2012 the topic Mathematics and … was selected, since promotion of young researchers in this field was regarded as a timely step to support universities and research institutions in their search for new talent. International talent was reported to be available, allowing the exploration of interesting niches, such as biomathematics.

(2) If **a call has already been run** in the topic: **Is the community in the field ready for a new call?**

— In 2014, it was decided that another Life Sciences topic should be issued to further progress in this field of strength.

— In 2015, a range of options were discussed and a subfield of Life Sciences was selected as a future call topic, namely following the proposal of the Life Sciences 2014 jury, "Bio- and Medical Informatics" (to close gaps in imaging)[13]. The call was renamed and broadened to "Computational Biosciences" to better reflect the needs in Vienna.

**(3) Has a need emerged/re-emerged within the scientific community in Vienna for new/established topics?**

— In 2018 it was decided to launch a major initiative in ICT that would also be in accordance with efforts in Vienna to establish a broader initiative called „Digital Transformation Vienna". Three VRG positions were thus dedicated for the 2018 call. This was followed in 2019 by a call with the topic of Interdisciplinary Data Science, which aimed at advancing data science issues on the basis of use cases and also linking ICT with Life Sciences and Humanities.

[11] After the first VRG program call, the excellence and usefulness of the instrument in strengthening Vienna as a research location were highlighted by the jury and further confirmed by the WWTF boards.

[12] After the call was finalized, the jury commented very positively on the procedure. A continuation, or even expansion, of the program were seen as important.

[13] The jury stated in their feedback that "Vienna lacks a sufficient number of strong group leaders in bioinformatics and medical informatics" and "[the call] would have a strong, positive impact on research activities across biology and medicine". They further commented that "without further investments in this area, it will be difficult to maintain competitiveness and to make best use of the rapidly growing volume of Life Science data becoming available". Overall, this field was seen to be still underpopulated in Vienna, also taking into consideration the background of the broader life sciences sector.

## 3. Goals of the program

The **general goal of the program is to strengthen Vienna as a research location**. The instrument endeavours to place a **special emphasis on the promotion of young researchers in fields that are important for Vienna**. The resulting operational goals of the program, in accordance with the VRG funding guidelines, are shown below in table 5.

**Table 5: Goals of the VRG program**

| Level | Goal |
|---|---|
| **Program objectives** | – Attracting and long-term embedding of outstanding young talent to and in Vienna<br>– Supporting the further development of career promotion models at Viennese universities and research institutions<br>– Strengthening of central research fields in Vienna |
| **Program activities** | – Attract young talented researchers (approx. 2—8 years after PhD) from abroad and embed them at Viennese host institutions<br>– Provide VRG leaders with substantial resources to conduct excellent research and pursue an academic career<br>– Nurture talent and provide a clear career impetus<br>– Continuous work with the universities / research institutions in Vienna to gradually improve career models for young researchers |
| **Output (= immediate results of the funding)** | – Establishment of independent junior research groups at Viennese research institutions<br>– Implementation of scientifically high-ranking and innovative research projects<br>– Increasing internationalization of the hosts (bringing in international contacts and working group members)<br>– Leverage effect for the acquisition of further (high-ranking) third-party funding<br>– Promotion of young talents with career impulses in an early phase: essential career steps are to be taken within the duration of the project |
| **Outcome (= results after completion)** | VRG group leaders:<br>– Successful career in/outside of science<br>– Successful completion of the research program<br>– Boost in the scientific output of the grantees<br>– Successful continuation of the research group after completion of the funded project<br>– Leadership experience and group management skills in Vienna or elsewhere<br>– Establishment of high-quality personnel and scientific networks<br><br>Host institutions:<br>– Recruiting young, excellent junior scientists to Vienna<br>– Strengthening the host institution's research profile<br>– Creation of new research impulses and fields, or bridges between established fields<br>– Increasing (international) networking and visibility<br>– Structural developments in career support for young talent |
| **Impact (medium-term)** | – Contribution to the establishment of certain thematic fields in Vienna<br>– Establishing and expanding strong research areas in Vienna in a manner that is meaningful complementary with existing research strengths<br>– Further development of career models at Viennese universities and research institutions |

## 4. VRG in context

**Vienna is clearly the academic centre of Austria, hosting nine of 22 universities and the majority of the sub-units of larger extra-university research organisations** (e.g., Austrian Academy of Sciences, AIT, Ludwig Boltzmann Institutes)[14]. Approximately 60 % of the about 284,000 students in Austria study at Viennese universities.

Vienna is home to a high concentration of public universities, including the University of Vienna (> 90,000 students), which is by far the largest university in Austria. Furthermore, Austria has 21 Universities of Applied Sciences, four of which are located in Vienna.[15]
With respect to the VRG funding calls, the main counterparts and major potential host institutions in Vienna are listed below in table 6.

[14] See https://www.bmbwf.gv.at/Themen/HS-Uni/Hochschulsystem/Universit%C3%A4ten/Liste-Universit%C3%A4ten.html and https://www.bmbwf.gv.at/Themen/HS-Uni/Hochschulsystem/Privatuniversit%C3%A4ten/Liste-Privatuniversit%C3%A4ten.html

[15] See https://www.bmbwf.gv.at/Themen/HS-Uni/Hochschulsystem/Fachhochschulen.html; excluding Lauder Business School

[16] Social Sciences and Humanities

**Table 6: List of larger Viennese host institutions**

| Name of institutions | Type of Institutions | Research Area | Scientific Personnel | Source |
|---|---|---|---|---|
| Academy of Fine Arts Vienna | Public University | Fine arts | 183 | Unidata |
| Medical University of Vienna | Public University | Medicine | 2,913 | Unidata |
| Vienna University of Technology | Public University | Technological research | 2,581 | Unidata |
| University of Applied Arts Vienna | Public University | Applied arts | 261 | Unidata |
| University of Natural Resources and Life Sciences, Vienna | Public University | Natural resources, life sciences | 1,170 | Unidata |
| University of Music and Performing Arts Vienna | Public University | Art (music, performance) | 616 | Unidata |
| University of Vienna | Public University | Comprehensive | 3,971 | Unidata |
| University of Veterinary Medicine, Vienna | Public University | Life sciences | 591 | Unidata |
| Vienna University of Business and Economics | Public University | Business / economics | 859 | Unidata |
| Austrian Academy of Sciences | Publicly funded, non-university institution | Departments / commissions in the life sciences, natural sciences, and SSH[16] | 1,534 | FIT 2021 |
| Austrian Institute of Technology-AIT | Publicly funded, non-university institution | Research and technological development in infrastructure-related technologies | 1,149 | FIT 2021 |
| Ludwig Boltzmann Gesellschaft-LBG | Publicly funded, non-university institution | Several Institutes, mainly in health sciences and in history | 323 | FIT 2021 |

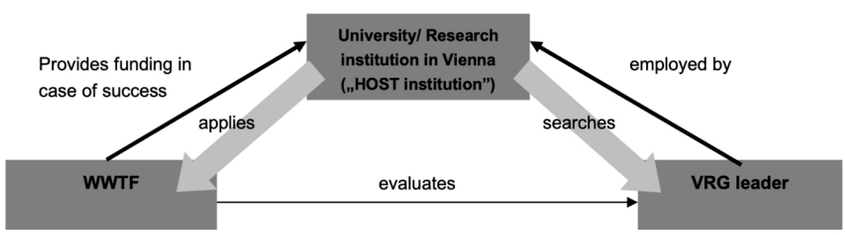
The VRG program involves several key roles, whose main interactions are depicted in figure 6.

WWTF launches the call and informs potential Viennese host institutions, who then commence a search for potential VRG leaders. A proponent from the Viennese host institution applies in tandem with the VRG candidate to the WWTF. WWTF evaluates the potential VRG leaders and, in case of success, provides funding to the host institution. The Viennese host institution then employs the successful candidate(s).

With minor adaptations, the same overall process is followed every year and is depicted in figure 7.

Vienna **host institutions are required to advertise the VRG position broadly and internationally and strongly encouraged to make a pre-selection of candidates**. The potential VRG leader (from abroad) and a prominent local researcher, who acts as proponent at the Vienna host institution, **apply in tandem to WWTF**; the formal applicant is the university.

**Figure 6: Roles of participating institutions and persons**




## 5. Selection procedures

Before the commencement of the selection process, WWTF office actively informs Viennese host institutions about the upcoming call. This includes advertisement of the program and selected appointments with rectorates to advise in advance of the topic for the upcoming call (preceding the call launch).

Guides and information (e.g., Call Fiche, Guide for Writing a Proposal) are then made public and distributed directly to potential Viennese host institutions. This is followed by individual consultation sessions and one general Proposers' Day to inform interested proponents and candidates.

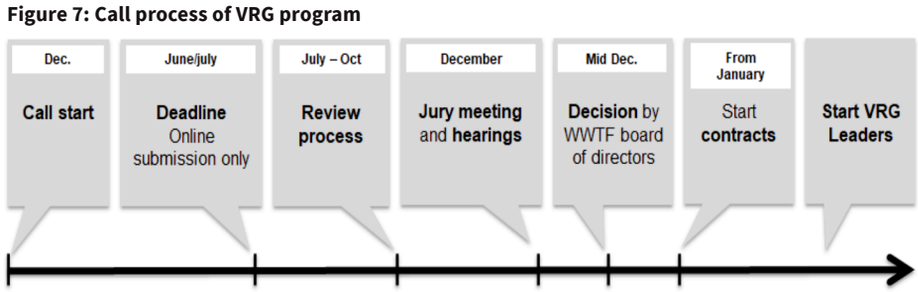
Sufficient time is provided for the Viennese partners to find and select potential applicants.

The selection follows a **multi-stage process**. **An international jury of high-ranked scientists selects the VRG group leaders based on written review reports by international experts and a jury hearing of the candidates.**

The specific steps are:

— All projects (proposals) submitted by the application deadline will undergo a formal eligibility check by the WWTF office. Projects that do not meet the formal criteria will be rejected at this stage.

**Figure 7: Call process of VRG program**



– First qualitative assessment by an international jury assembled to cover the breadth of potential topics. Proposals that are not in the thematic focus of the call or that do not meet international scientific quality standards will be rejected at this stage and not be considered for the review process. Applicants will be promptly informed about rejections and will be provided with a short jury statement explaining the decision.

– The remaining proposals will be assessed by at least two, but normally three to four, international written peer reviews.

– On the basis of the written peer reviews and the jury's own expertise, a selection of candidates are invited by the jury to hearings in Vienna. The main evaluation criteria are scientific excellence of the candidate (track record according to academic age), excellence of the research proposed and fit to both the call and the Viennese host institution. Applicants will be informed about rejections.

– All remaining candidates are comprehensively evaluated in hearings at a jury meeting in Vienna, resulting in a funding recommendation. Attendance of the hearing in Vienna is mandatory in order to be considered for funding. During 2020, the process was online due to COVID.

– The assessment process is completed by the formal approval of the funding decision by the WWTF Board of Directors, which has until now always followed the jury recommendation.

– After the formal funding decision, candidates/proponents whose proposals have undergone the written peer review process will be informed about the decision and receive the anonymized reviews.

– The selected candidates and the Viennese host institution must finalize an employment contract no later than two months after the formal decision by the WWTF Board of Directors. If the selected candidates fail to fulfil this step together with the Viennese host institution, funding will be offered to the reserve.

– The funding contract will be concluded amongst the WWTF and the host institution of the group leader (for universities, according to §27 of the University Law 2002). The group leader is fully independent concerning the work and resources.

– WWTF monitoring during the running time of projects includes annual short reports delivered by the VRG leader to WWTF with an overview of the scientific results achieved, cost sheets as well as project outputs. WWTF also conducts site-visits to learn about the project’s progress and working environment of the personnel employed. A comprehensive final report must be submitted online after the end of the project.

After four years (at the beginning of the fifth year), an **interim evaluation** of the VRG is mandatory. The details should be specified in the original application and should strive for a common evaluation between the host institution and WWTF, and is **usually linked to a career promotion decision**. If this is not possible, WWTF office conducts its own evaluation, contacting formal reviewers or jury members to assess the progress.

## 6. Status quo

Through **eleven calls** (up to 2020, see table 7), the VRG Program has **received a total of 180 applications** (32 female applicants) **and funded 23 positions** (five female funded applicants). A further **19 reserve candidates** have been nominated, in case selected applicants withdraw their application. Over the lifetime of the program, reserve candidates have only been twice offered a position, as nearly all recommended candidates accepted their position.

The average **overall success rate is 13 % and the program therefore highly competitive**.[17]

[17] To the best of our knowledge, very selective pre-screenings are undertaken by the individual Viennese host institutions (i.e., before the applicants apply in tandem with the Viennese host institution to WWTF), which have not been taken into account here.

**Table 7: WWTF funding TOTAL 2010-2020**

| | | | |
|---|---|---|---|
| Number of VRG calls | 11 | Number of applications | 180 |
| Number of persons funded | 23 | Number of reserve candidates | 19 |
| Number of female applicants | 32 | Number of female funded VRG | 5 |
| Total of WWTF funding in VRG in this area | | **€ 34,356,585** | |
| Overall average success rate | | 13 % | |

**Table 8: Overview of VRG calls until 2020 (positions funded and funding volume)**

| | LS | MA | CI/CS | ICT | € |
|---|---|---|---|---|---|
| **2010** | 3 | | | | 4,499,600 |
| **2011** | | | | 2 | 3,000,000 |
| **2012** | | 2 | | | 2,995,450 |
| **2013** | | | 1 | | 1,499,466 |
| **2014** | 3 | | | | 4,799,000 |
| **2015** | 2 | | | | 3,197,900 |
| **2016** | | | | 1 | 1,600,000 |
| **2017** | | 2* | | | 1,733,479 |
| **2018** | | | | 3 | 4,798,900 |
| **2019** | | | | 2 | 3,033,670 |
| **2020** | 2 | | | | 3,199,120 |
| **Total funded / €** | **10** | **4** | **1** | **8** | **34,356,585** |

*One VRG group leader left after a year to another institution. The money was reused in the following year.

44 % of the funding money has been awarded for Life Sciences, 35 % to ICT, and 17 % to Mathematics (see figure 8). The share for Cognitive Sciences is below 5 %; however, only one call has been run with this topic (2013) as the scientific community was quite small in Vienna. It should also be noted that a number of VRG leaders work on cross-disciplinary topics.

From the total submitted pool of 180 proposals, the University of Vienna has submitted the highest number (65 in total), followed by the Vienna University of Technology (58 proposals) and the Medical University of Vienna (29 proposals) (see figure 9).

From the three institutions that have submitted more than 20 proposals, University of Vienna has the highest acceptance rate (20 %), followed by the Vienna University of Technology (12 %). While MFPL, a joint institution between the UWien and MUW, has also acted as a proposing institution, we have assigned MFPL proposals to the two universities according to the affiliation of the proponent. "Other institutions" comprises eight different organisations, including AIT, WU and GMI.

A total of **72 jury members have been involved in VRG calls**, with an average of six to seven jury members per call. Out of the 72 jury members, 16 have taken part in two VRG calls, and one member in three VRG calls (table 9).

Overall, 16 nations have been involved (i.e., country of the jury member's institutional affiliation), **mainly from Europe** (47 % EU, 33 % other Europe including UK, figure 10). The greatest number of jury members have come from institutions in Great Britain (25 %) and Germany (21 %), followed by US (10 %) and Switzerland (8 %) (see also Annex chapter 3, figure 15 for more details and all jury member names per call online at www.wwtf.at).

**Figure 8: WWTF funding per field 2010-2020**

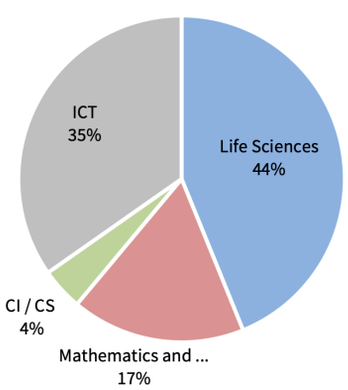
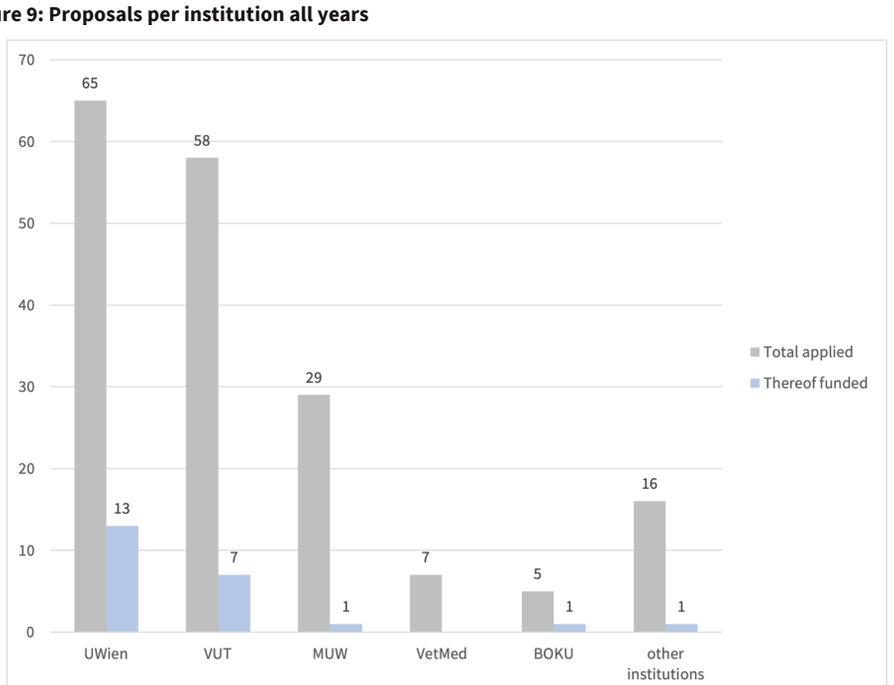



**Figure 9: Proposals per institution all years**



For gender aspects please see Annex chapter 3, figure 16. In total, 453 reviews have been obtained for 117 full proposals, indicating on average of **3.9 reviews per proposal** (two is the minimum requirement).

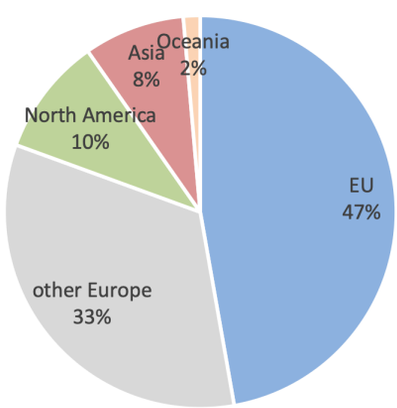
**The average academic age (years after PhD) of funded VRG leaders is around 4.4 years.**

**Table 9: Overall jury statistics**

| | | | |
|---|---|---|---|
| Number of calls | 11 | Average no. of jury members | 6.5 |
| Number of jury members* | 72 | Number of nations involved | 16 |

* Only those jury members are counted that took part in the final meeting and thus in the definite decision-making. 10 additional persons were part of the jury but could not attend the final meeting.

**Figure 10: Regional distribution of WWTF jury members (nationality of jury members' institutional affiliation)**



## 7. Changes over time

Since the start of the VRG program, several major changes in the program's context and design have taken place. One significant was the development of a tenure-track model in Austria, which had not previously existed at the commencement of the VRG program.

### 7.1. Changes in context: tenure-track[18]

The **legal framework for staff working at universities is essentially defined by the Universities Act 2002 (UG)**. When the UG came into full effect on 1 January 2004, the universities acquired extensive autonomy. University employees were no longer subject to public employment law, but to private employment law. As of 2009, the **collective agreement (KV) for university employees** concluded in that year was added as a further legally relevant framework condition.

Staff are broadly divided into the scientific (incl. artistic) university staff and general university staff. The group of scientific university personnel includes university professors, university lecturers and scientific staff in research and teaching, as well as MDs in specialist training.

Admission as a university professor is generally preceded by a traditional appointment procedure (including an open call, often in a narrow discipline, internal committee for selection, rector with leeway to decide) pursuant to § 98 or an abbreviated appointment procedure pursuant to § 99 UG. The group of general university staff includes, for example, administrative staff, technical staff and library staff.

[18] all information in this chapter 7.1 comes from sources [13] and [14].

**The basis for a new university career model was formulated in the collective agreement that came into force in 2009**. The career model outlined in the collective agreement was mapped in the UG. **The 2015 amendment to the UG, which came into force in 2016, reformed the career model. It was a step towards strengthening the participation rights of the level** below full professors. The process was as followed:

(1) From **2010 to 2016**, the career path began with the offer of a Qualification Agreement (QA). Individuals employed as University Assistant, Senior Scientist, and Senior Lecturer were eligible for the offer of a QA. Upon receiving a QA, the individual was employed as an "Assistant Professor". If the qualification goals specified in the QA were fulfilled, the employment status was changed to "Associate Professor". However, advancement to employment as a "full" university professor was not provided for in this process. Therefore, young scientists at their university did not have a continuous career perspective up to the level of full professorship.

**The career path outlined in the collective agreement ended with the attainment of a permanent position as an "associate professor". However, it did not lead to the professorial curia in the sense of the provisions of university law.** Note that this was already a titanic step away from the guild-like traditional system of masters and their endlessly dependent apprentices.

(2) With the **2015 amendment to the UG**, a differentiation between university assistants with and without the offer of a QA was introduced. The career position began with employment as "university assistant on career position". By law, positions are required to be advertised internationally, followed by a selection procedure conducted in accordance with internationally competitive standards. Analogous to the previous model, the offer of a QA leads to employment as an "Assistant Professor".

However, the completion of a QA and the associated start of a position as an assistant professor can also occur directly without involving the offer of an QA. This procedure was also possible in the original model. If the qualification goals are met, employment as "Assistant Professor" is likewise terminated in the new career model and changed to "Associate Professor".

**However, these persons are now part of the professorial curia and are on an equal organisational footing with university professors (leading to a "more-close-to-tenure-track model"** according to § 99 (5 and 6) UG). For **associate professors of the original career model, the amendment to the law created the possibility (§ 99(4)) of advancing to the position of "full" university professor by means of a simplified appointment procedure**.

In this confluence of global competition and venerable tradition, the VRG program emerged as a useful "experimental ground" for universities to explore improved career models.

## 7.2. Changes of the program

Firstly, the type of **financing and its flexibility** has changed.

(1) From 2010 until 2013 (inclusive), **annual grants** in the form of subsidies for two leadership positions were negotiated with the City of Vienna. This did not give the necessary flexibility to react to changing conditions in Vienna.[19] Therefore, **from 2014 onwards, a three-year program with flexible usage of six positions was established**.[20]

(2) Financing is assured until the end of 2022. Until 2017, the managerial costs were paid by the **interest rate** earned through the investment of the funding volume (which was transferred to WWTF early in the year). From 2018 onwards, a **fixed management fee** was established due to low interest rates.

(3) The **funding volume also increased over time**, starting from € 1.5 m for the period 2010—2013 and rising to € 1.6 m for each position by 2014. Tailoring the sum for the requirements of individual fields (e.g., experimental or theoretical) would have been very complicated from the side of the City of Vienna.

(4) In 2013, the installment of an **additional financial bonus** for the host institution was established. The goal was to provide an **incentive to the Viennese institutions to propose female leaders to WWTF,** as the ratio of female candidates had been quite low. As WWTF is not directly involved in the selection process, the opportunity to apply for an additional grant (up to € 50,000) for gender mainstreaming activities of the institution was installed. This option is available if a female applicant is successful in the selection process and receives the VRG funding. Up to now, four such additional fundings have taken place (2014, 2015, 2017, 2018).

Secondly, the **application and selection process** and its duration have changed over the years. At the commencement of the VRG program in 2010, the call followed a **two-step procedure**, such that a short proposal was followed by a full proposal upon invitation. In 2013, this was **changed to a one-step procedure with only one concise full proposal**. This change was implemented by WWTF in response to criticism of the long selection procedure. The hearings in Vienna (or online in 2020 due to the COVID pandemic) remained the same.

[19] As many excellent proposals were submitted in 2010, an additional slot was negotiated to grant three positions instead of two. In 2013, WWTF returned € 1.5 m to the City of Vienna as the number of applicants was limited, due to the small size of the research field "Cognitive Sciences".

[20] This includes 2014-2016, 2017-2019, 2020-2022 respectively.

Thirdly, the **guideline** of the VRG program have been changed over the runtime of the program. In 2012 the following amendments were made to better reflect the needs of the community and the goals of the program:

(1) The requirement for **academic age was softened**, from two to eight years after PhD to "in general" two to eight years after PhD. This change was included to allow applications from very talented young researchers (high potential) below two years after PhD. However, at the other end of the spectrum, WWTF continues to strictly adhere to the upper age limit of eight years. Academically more senior applicants are informed that they must show a significantly more elaborated track record than younger competitors. The tolerance limit stops completely at nine years; after this threshold, applications are no longer eligible for the program.

(2) An **active international search and recruitment** of potential applicants by the host institution **was made more explicit and obligatory**. As the application to WWTF is made in tandem between the host institution and the candidate, WWTF is not directly involved in the advertisement and recruitment of candidates. A tendency was observed in the initial year of the program towards recruiting mainly (male) researchers already known to the proponents (e.g., former PhD students returning after several years abroad). In response, a more international search and recruitment process was made mandatory in order to be eligible for the application (e.g., demonstrating a job advertisement in a journal relevant to the field or via mailing lists). WWTF also offered the possibility of publishing job announcements on its webpage. In 2020, WWTF made a job announcement in *Science* and *Nature*, and invited potential Viennese host institutions to post a link to their specific announcement.

(3) The interim evaluation time was adapted to ensure a **joint evaluation** between WWTF and the host institution. WWTF determines the continuation of funding, while the host institution decides about the employment decision.

The VRG program's funding guidelines are currently undergoing revision and incorporation into the general WWTF funding guidelines.

## 7.3. Evaluations and lessons learned

In **2013—2014**, an international review panel consisting of seven high-level researchers, led by Martin Grötschel from TU Berlin, was commissioned to **evaluate the impacts generated by WWTF**[21]. The panel was tasked with evaluating the quality of people and projects funded, the impact of WWTF funding on the careers of the researchers involved in WWTF-projects, the development of the associated groups, WWTF's influence on the universities and research organisations in Vienna, as well as on the broader environment in which it is active.

The **assessment of the review panel with regard to the VRG program was very positive**: "The three basic programs they support, Projects, VRG and Science Chairs, have a great impact: (…) VRG because it brings new and young talent from abroad into the system; (…). All three support programs are much needed" [1: p.10].

The following aspects were highlighted:

**(1) Impact on research careers**: The impact on careers was clearly mentioned: "WWTF promoted early career researchers and provided tenure-track positions (VRG) …" [1: p. 14]. However, "The effects on careers are likely to last for Science Chairs. For VRG leaders, the durability is still unclear because none of them has finished their

[21] See the results here: https://www.wwtf.at/funding/our-principles/transparency/and the members of the review panel here: https://www.wwtf.at/epaper/WWTF_impacteval2014_PanelReport/index.html#page=1

term yet. The selected researchers will likely get attractive offers from abroad, too. A concern is that VRG leaders will receive very little recurrent funding beyond their salaries. This is problematic in labour-intensive experimental sciences (such as biosciences)." [1: p. 15].

**(2) Reputation**: Despite the small sample of VRG leaders included in the evaluation, the reputation of the funding scheme was seen as very high: "Not only the universities but also the young researchers value the VRG funding line highly. It gives them the possibility of independent research early in their own career. It was important for the review panel to observe, that the VRG program also has a high international reputation." [1: p. 16].

**(3) Driver of change**: The review panel came to the conclusion that the VRG program promotes change: "The VRG program is definitely a driver for change in the universities …" [1: p. 20].

Two recommendations were made for the VRG program. These are listed below, along with the status of their implementation since the evaluation.

The 2014 evaluation already noted meaningful impacts of the VRG program. However, as the evaluation was conducted only a few years after the program's commencement, it could not fully assess several crucial aspects, such as its impact on group leaders' careers and effects on the research group after end of WWTF funding.

| **Flexible amount** | |
|---|---|
| R6 | "Although the Vienna Research Group program is seen as a program that excellently fits the environment, there are a few details that might be considered. It may be reasonable to be more flexible with respect to the amount of WWTF funding, depending on the area funded. Otherwise it may be that offers made in the VRG program are not internationally competitive." |
| The amount of the VRG funding is standardised and negotiated with the City of Vienna. However, we introduced a flexibility mechanism to allow adaptation in the number of funded people in each call. This provides the possibility of selecting more VRG leaders in larger research areas (I.e. ICT) and fewer VRG leaders for funding in smaller area in Vienna (I.e. Cognitive Sciences). The majority of funding should be used to fund personnel costs; however, if infrastructure is necessary to successfully fulfil the planned research, this may also be funded by the grant. | |

| **After WWTF funding** | |
|---|---|
| R7 | "An advice to the universities involved: They should make sure that the capacities built up by the VRG projects will not get lost at the end of the WWTF funding period." |
| This aspect is quite difficult for WWTF to change. However, we have raised this problem with host institutions and also encouraged VRG leaders to seek third party money early on. Unfortunately, the in-kind contributions have decreased over time (as depicted in figure 11 later on). | |

## 8. Effects of the VRG program

A comparative study and bibliometric analysis have been commissioned through the AIT to evaluate the outputs of VRG leaders. The following findings focus on structural effects and selected relevant examples.

### 8.1. Career effects

**Career advancement has accelerated over the years**. At the time of the program's introduction to the Viennese scientific landscape **in 2010, the tenure track perspective was not well developed, if at all, compared to advanced systems abroad**. However, since the introduction of the VRG program, the institutions have incorporated the program and its incentives into own inhouse processes and procedures.

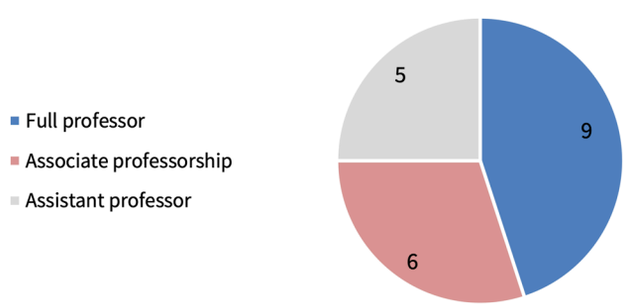
Already at the application phase, the steps leading to a tenured position or an equivalent career path (e.g., the exact process of obtaining a "Qualifizierungsvereinbarung" (QA)/qualification agreement including time frames) must be described in detail.

The qualification agreement is largely standardised and sets the goals that must be fulfilled within a given timeframe (usually four years) in research, science and teaching, etc. Upon fulfilling the qualification requirement, the VRG leaders obtain a permanent employment contract. Providing a clearly defined career plan for the candidate is also an essential criterion in the funding recommendation and decision. The typical standard process for universities is depicted in table 10 on page 31.

Twelve interim evaluations have thus far taken place, all of which have been positive. Currently, nine VRG leaders have obtained the full professorship career level, six are at associate professorship level, five are assistant professors (see figure 11).

While most VRG group leaders have initially started at a university assistant/postdoc level on tenure track, **VRG leaders in recent years have increasingly started from a higher career level.** In 2018, a VRG leader commenced as an Associate Professor, while a candidate in 2019 entered the program at the Full Professorship level. **VRG leaders also fulfilled their qualification agreement earlier**.

**Figure 11: Current career levels of all active VRG leaders (2010-2019)**



From 2013 onwards, some VRG leaders commenced their position with a qualification agreement (rather than after two years into the grant). Others fulfilled their agreement before the planned four years, after it was deemed that they fulfilled all necessary requirements. Analysis of the group of reserve candidates shows that they have likewise been very successful. Thus, overall, the program is able to identify very prominent young researchers.

## 8.2. Grants

In order to assess WWTF's impact on people and their careers, another indicator has been selected, namely: what other grants have VRG-funded researchers been awarded? Our assessment covers not only the duration of the VRG project, but also tracks the leaders' subsequent development. Data in the WWTF monitoring system shows that WWTF-funded researchers have received numerous grants, both national (in particular, FWF grants) and international (ERC grants) (see table 11). These grants, in particular, have been taken as indicators of research excellence.

**In total,** WWTF funded VRG leaders have been awarded four ERC grants, including three ERC starting grants and one consolidator grant.

Moreover, VRG leaders have obtained two FWF Start Grants, one of whom rejected the offer due to relocation reasons.

For further impacts on people and their careers please also refer to Grit Laudel's case study [5].

**Table 10: Standard process of VRG careers**

| | | |
|---|---|---|
| **Start, year 0** | Start as post-doc or Assistant Professor | ↓ |
| **Year 1—2** | Signing of a qualification agreement (QA) after 2 years | ↓ |
| **Year 3—6** | Upon fulfilment of the qualification agreement (duration 4 years) with an evaluation, promotion to Associate Professor | ↓ |
| **Year 7—8** | Position as Associate Professor with the potential for a full professorship position | ↓ |

**Table 11: List of acquired grant / award types since 2010**

| | |
|---|---|
| ERC grant | 4 |
| EU Framework program grant other than ERC | 5 |
| FFG grant | 4 |
| FWF individual grant | 19 |
| FWF Start grant (comparable to ERC Starting Grant or VRG grant) | 2 |
| FWF person funding | 2 |
| Other international awards | 16 |
| Other national awards | 9 |
| Other international grants (from e.g. DFG, EMBO, NIH) | 31 |
| Other national grants (from e.g. OEAD, OEAW, ..) | 18 |
| WWTF project grants | 9 |

# III. Self-assessment WWTF office

The following section presents WWTF office's view of the program, its outputs and impacts, as well as some exploring of some core insights. We begin by highlighting several underlying aims, norms and values that shape our work:

Only a small number of people get quite large amounts of money.
The VRG program is a flagship in our funding portfolio.

The design of calls, grants and administrative relations must be streamlined and customer friendly.

The playing field for research is global, so the benchmark and the review / selection procedures are likewise global. Evaluation is conducted according to international standards.

We are aware of the small size of our overall funding capacity and employ a niche strategy. However, through our particular approach, we view ourselves as a strong driver for change in certain aspects (here career development for young researchers) of the Viennese research landscape.

**We strive for** a balance between trusty collaboration with universities and competition with and challenging of universities. The self-assessment reflects upon topics ranging from impact on career models, procedures, WWTF's mode of operation to insights into gender dimensions and the role of other stakeholders.

## 1. Fulfilment of program goals

One of the VRG program goals is to attract and embed young talented researchers in Vienna. Currently, **13 group leaders from the 21 selected candidates between 2010—2019 are still at the host institution with which they applied for the VRG program, and 14 are still in Vienna.**

The major reasons for the remaining changes are:

— Offered and accepted full professorship or a very competitive package abroad as well as sabbaticals at other institutions or changed affiliations in Vienna

— Unexpected death of a group leader

As stated in the 2013/14 impact evaluation, a main challenge faced by VRG group leaders is the need to find additional resources after the end of WWTF funding (i.e., from year six onwards).

As we have observed from the VRG leaders, we understand that research is highly competitive and demands a level of flexibility and mobility from researchers. Thus, it is a dynamic process through which WWTF seeks to attract and retain the best young scientists in Vienna. We must constantly consider and compete with the recruitment process within the scientific community, which requires researchers to remain mobile to obtain the best offers.

## 2. Process aspects

Changes and adaptations in the processes of the VRG program were underpinned by several key insights and reasons:

(1) Viennese institutions **included the VRG process into their internal procedures**. To the best of our knowledge, VUT and the University of Vienna were the first institutions to adopt the criteria into their own processes (e.g., for the interim evaluation 2015), with other institutions following thereafter. For example, MFPL, a joint initiative between UWien and MUW, introduced in 2014 a very competitive pre-selection of potential candidates, which itself was preceded by an organisation-wide advertisement initiative. This translated into significant results in the call for Life Sciences. Moreover, in 2021, the University of Vienna once again adapted their own internal procedures to align processes.

(2) Nevertheless, some organisations have stated that **the competitive selection process of applying to WWTF with a candidate is too prolonged** compared to, for example, opportunity hiring. This is especially true for smaller leading non-university institutions with very active recruitment processes, such as IMBA, IMP and GMI. Following talks with these institutions, WWTF office sought to reduce the timeline for selection, while maintaining the high procedural standards. However, these organisations still do not, or do not regularly, participate in VRG calls, as they have the capacity to recruit excellent people rather quickly through their own processes. In addition, we have observed that candidates withdraw their WWTF application during the selection process as they receive other offers.

(3) The main criterion for selection is excellence, which is clearly stated in the application guidelines and communicated to all jury members and reviewers. Competitiveness and fit to the topic of the call is evaluated by the jury in the first round of evaluation. **Interdisciplinarity is not a mandatory criterion for each call**, i.e., there are specific additional criteria important for certain calls (e.g., joint application with another scientific discipline in applied mathematics) (see Annex chapter 1, table 12 for detailed information about each call and its specifications).

## 3. Interaction with VRG leaders during project runtime

WWTF seeks to establish a trustful interaction and relationship with the funded VRG leaders, balancing management and freedom to conduct research. Where necessary, we also assist with integration. In addition to formal procedures, several social activities are organised to welcome and embed VRG leaders in Vienna:

(1) To welcome the VRG leaders, an **official joint lunch with the major of the City of Vienna** was introduced in 2012. Since then, five such functions have been held to welcome the VRG leaders from the years 2010—2018. In addition to the VRG leaders, the mayor and other high-level representatives of the City of Vienna, as well as proponents and rectors of the Viennese host institutions and selected company representatives (who may be interested in the current topic) were present. This tradition was unfortunately interrupted by the corona pandemic.

(2) WWTF office usually **visits the VRG leaders in the first year** after the start of their project to personally introduce itself, meet the group and answer potential questions. During the runtime of the project, WWTF offers the **possibility to adapt the work plan according to project needs and helps the candidates** if problems arise (salary, problems at work, etc.). WWTF office puts itself forward as a partner to which the VRG- funded leaders in Vienna can turn.

(3) To foster exchange between VRG leaders across multiple calls, an informal **hiking day** was introduced in 2014. This social event has since taken place every year. Feedback to this event was always very positive, as it offered an opportunity for discussion of shared interests with other researchers from very different disciplines.

This has been accompanied by several other organised events, i.e., Christmas market visits, Science Dinner (an annual WWTF function to celebrate all selected projects from the year), as well as funding schemes. An example is NEXT, a small funding scheme to help already funded projects transfer their results outside of the scientific community. In 2019, two of the five NEXT-funded projects were awarded to VRG leaders. Moreover, cooperation exercises like matchmaking between Vienna and Brno through an existing initiative organised between WWTF and several Czech partners have been organised. Some fruitful cooperation has been reported to have developed from these events.

## 4. Financial aspects

Decisions about financial questions and aspects are made on a **case-by-case basis and adapted to the needs of the respective group**. We adhere to the principle that maximum flexibility should be given to VRG leaders in order to allow them to focus on their work.

If financial changes become necessary, they must be reported in the annual report or directly discussed beforehand with WWTF office. Changes in the same categories (e.g., personnel, if one position could not be filled as planned) present no objection. However, concerns are raised when larger amounts of personnel costs are shifted to non-personnel costs without reasonable justification. Further examples of potential concern include:

— **Third party funding**: According to the guidelines and structure of the program, VRG leaders should and need to increase third party funding over the course of their grant, especially as WWTF funding decreases significantly after the first five years. With respect to additional funding, questions have often arisen as to how to manage the working time of the group leaders. WWTF office is flexible regarding the spread of working time for the VRG project and other projects, i.e., to make the third-party funding possible, the time commitment of the VRG leader to the VRG project can also be decreased (in the first years for 50 %, more in subsequent years) to allow the possibility of working on other grants, e.g., from the European Research Council (ERC).

— **Structural problems**: In the area of third-party funding, past experience showed a low success rate in obtaining the prestigious Austrian fund START-Preis[22] of the funding agency FWF (similar to the ERC starting grant), especially for more advanced VRG projects. VRG leaders appeared to experience difficulties in acquiring this grant, prompting WWTF office to start an exchange with FWF on this subject (2015). It emerged that, between 2010—2015, FWF did not favourably regard the awarding of a larger grant to researchers already holding such grants. Thus, VRG leaders had not been successful in their applications for larger FWF grants. After WWTF's intervention, this was made explicit in the FWF's funding program guidelines, and later also changed.

— **In-kind contributions**: A minimum of 20 % in-kind contributions (in-kind working capacity, consumables/software or monetary contributions) of the total project sum must be supplemented by the Viennese host institution.[23] The underlying intention is to ensure a strong commitment by the Viennese host institution and normally covers the salary of the group leader after a positive interim evaluation, in-kind working capacity of senior staff, administrative help or monetary contributions. However, as shown in figure 12, the percentage of in-kind contributions by the Viennese host institutions com-

[22] https://www.fwf.ac.at/en/research-funding/fwf-programs/start-program

[23] This does not include basic infrastructure, office equipment such as telephone, internet, or laboratory etc., and should be covered by overheads.

pared to the total project budget has progressively decreased and currently lies at 20—25 %). Nevertheless, WWTF pays overheads of up to 20 %.

– **Changes in project plans**: Certain cases have required special attention, especially following the unexpected death of one VRG leader and in cases in which VRG leaders have moved to another institution/city/nation. We deal with every case individually with the overall aim of maintaining a mutually beneficial connection between the VRG leader and Vienna (affiliation, reduced working contract) and ensuring that the careers of group members can be finalized.

## 5. Gender aspects

WWTF **constantly strives for greater gender equality through the entire funding cycle**. This includes an equal gender balance among jury members and chairs, monitoring the distribution of gender of the applicant pool throughout our evaluation process (application vs. review process vs. hearings vs. decisions), as well as other specific indicators.

In general, the proportion of female applicants in the program is relatively low as depicted in figure 13 (on page 36).

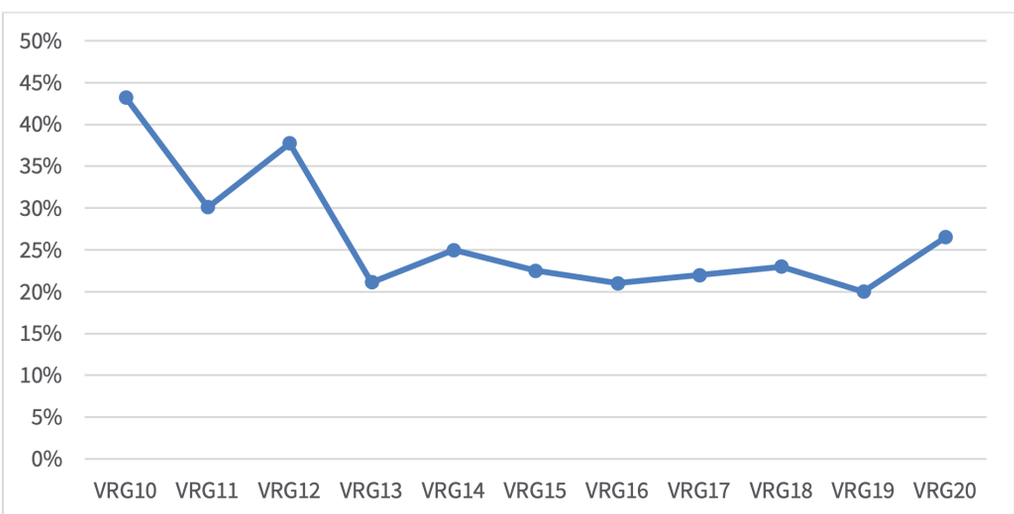
From the cumulative total of 180 proposals, 148 were submitted by men (82 %), and 32 were submitted by women (18 %). Analysing the percentage of each biological sex at all phases of the evaluation process from (1) formal check, (2) prep meeting I, (3) prep meeting II, (4) hearing to (5) funding decision reveals the following:

1) In all eleven years of the program, there were only two proposals that didn't meet the formal criteria and were rejected at the formal eligibility check (2012).

2) The proportion of female candidates remains constant, or even improves slightly, through successive stages of the application process (82 %:18 % applicants versus 78 %:22 % funded male:female). This indicates that there is no structural bias in the decision process that has negative effects on gender.

As previously described, WWTF introduced a new financial bonus in 2014 to encourage Viennese host institutions to actively search for potential female applicants with whom to submit an application.

**Figure 12: Percentage of in-kind contributions to total budget**



This bonus would allow the host institution, in case of the successful application of a female VRG leader, to apply for an additional – not competitive – grant up to € 50,000 for gender mainstreaming and affirmative actions. The bonus is not for the VRG leader but the institution. Since its introduction, the bonus has been awarded four times, three times to the University of Vienna and once to the Vienna University of Technology.

With respect to process, WWTF also strives for **gender balance in the decision body**, i.e. the jury (figure 14). Since the commencement of the VRG program, 42 % of all jury members have been women. In total, 72 jury members (including double counting) have participated in evaluation, including 42 men and 30 women. **Almost equal gender balance has been achieved in the juries of all VRG fields.** Only in ICT were there significantly more male than female jury members. From the eleven jury chairs across all calls, seven were male and four were female (36 % female).

**Figure 13: Gender distribution of proposals per year**

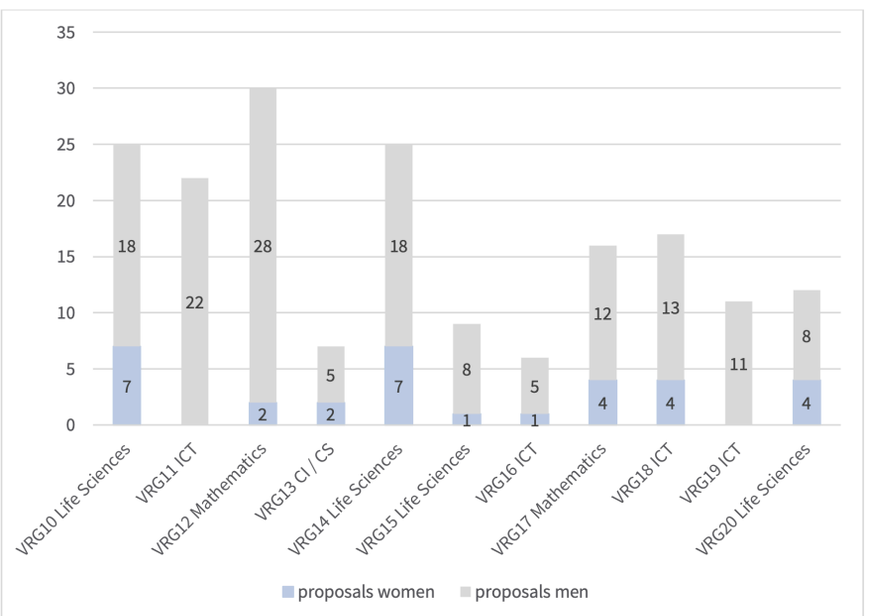
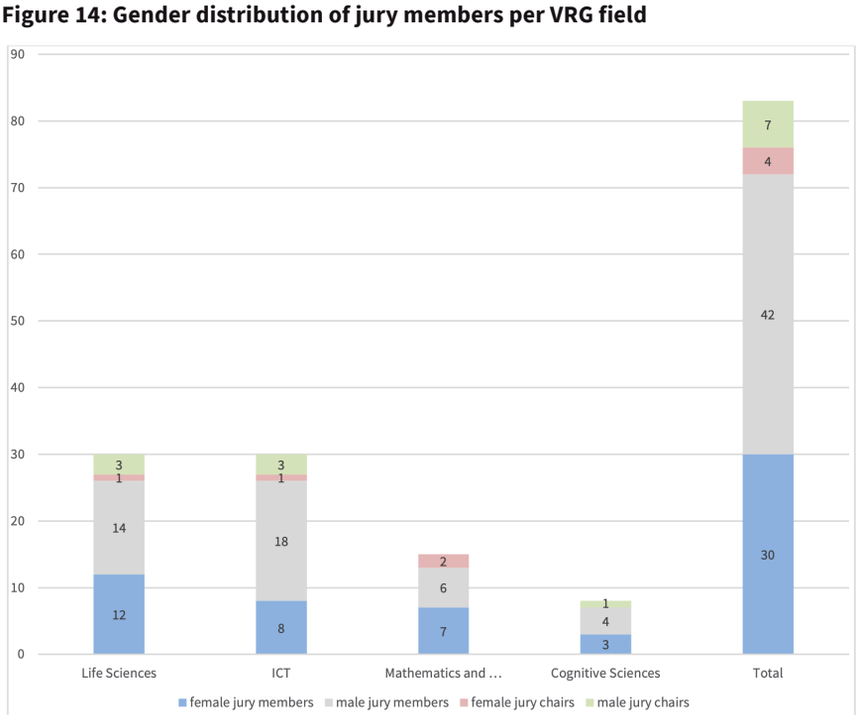



**Figure 14: Gender distribution of jury members per VRG field**



## 6. Role of stakeholders: proponents and host institutions

There are several roles in the program:

(1) The role of proponents as representatives of the Viennese host institutions is not specified by the program guidelines. Rather, the role is explained in the guide for writing an application as follows: “Who is the scientist at the Vienna host institution responsible for the coordination of the proposal? The proponent will support the applicant at every stage of the application and is responsible for the integration of the applicant in case of funding.” The proponent should thus take on the role as a mentor and link between the applicant and the host institution. As there is **no formal role or strict definition for the proponent**, the Viennese host institutions have each determined this role differently.

(2) The **role of the University Management is a formal one**: the university signs the application and guarantees a tenure track in case of a successful application and evaluation.

## 7. Role of stakeholders: City of Vienna

**The City of Vienna finances the program** and receives regular updates but does not otherwise interfere in the program. An annual report is delivered to the representatives of the city, which consists of a brief summary of the current call and annual reports from all VRG leaders with running funding. Amendments or changes are communicated and negotiated with the City of Vienna (MA7) in a written manner. In 2015, a brochure was released by WWTF office to provide an overview of the outcomes of the program.[24] The annual lunch hosted by the mayor of the city also provided an opportunity to foster exchange between the financing party and the VRG leaders. Ad-hoc information is provided if required by specific circumstances or major changes.

[24] https://www.wwtf.at/programmes/vienna_research_groups/

# IV. Outlook

The VRG program will continue to be financed in its current form until the end of 2022. The current twelfth call in Cognitive Sciences is presently midway through the selection process. We will proceed in keeping the administrative work as flexible and streamlined as possible. The highly competitive and international evaluation process has been very fruitful in bringing top talent to Vienna. Over the runtime of the program, we have also seen the need for adaptation, which has led to several changes. We are looking forward to the opinions and recommendations of the review panel in how the VRG program can proceed.

Donia Lasinger ©Georg Aufreiter.

## Insight: a note by the VRG program manager Donia Lasinger

“For over 10 years I have been responsible for this outstanding programme. During this time, I have been in contact with many fascinating scientists and witnessed their astonishing personal developments. The applicants and awardees are ambitious and excellent researchers from all over Europe and the world.

It is always a great pleasure to get to know them during the evaluation process, to accompany them through the stressful time of the hearings – and then further into their research careers. As a funding organisation, we see our role as a partner for these researchers, accompanying them in their journey and career steps. A great deal of exchange also continuously takes place with the Viennese research institutions that host these excellent scientists. These ongoing and fruitful collaborations provide the opportunity to adapt processes if needed and to react flexibly to emerging needs in the research community.

**In my view,** the VRG program is a prestigious and outstanding example of attracting scientific talent to Vienna.”

Michael Stampfer ©Martin Croce.

## Insight: a note by the WWTF managing director Michael Stampfer

“Why are we funding Vienna Research Groups?

— First, Vienna is still on its way to becoming an outstanding research location. Our great past as well as the development of the last twenty years both show that we definitely have the potential to be among the very best in an increasingly competitive scientific world.

— Second, this competitive setting means a global labour market for top talents and Vienna has to offer attractive positions and packages.

— Third, due to traditional reproductive academic patterns, a number of fields like quantitative biology or interdisciplinary data sciences have been understaffed at our universities, needing external support for starting new cross-disciplinary positions.

— Fourth, not only money matters for the attraction of top talents. Such key people do not appreciate old-style career paths with late independence and lack of tenure track.

We are proud of the achievements of our VRG leaders – as well as of those researchers who nearly missed funding status – and we see progress also on the organisation level.

**In all, this programme** shall serve two goals over the long term. The first is to introduce top young talent and facilitate stepwise institutional change through the VRG initiative. The second is to help raise the overall level of quality and interactions over the coming decades as one important part of the WWTF mission and portfolio.”

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# VI. Annex

## 1. Call overview and topic details

**Table 12: List of all VRG calls and specifications**

| Year | Topic | Max. Call sum | Topic focus[25] | Topic detail |
|---|---|---|---|---|
| VRG10 | Life Sciences | € 3,000,000 | Molecular mechanisms | — |
| VRG11 | ICT | € 3,000,000 | — | — |
| VRG12 | Mathematics and… | € 3,000,000 | — | — innovative mathematical methods that aim at applicable solutions in and together with other disciplines |
| VRG13 | Cognitive Sciences | € 3,000,000 | — | — cognitive processes in humans, animals and/or artificial cognitive systems |
| VRG14 | Life Sciences | € 3,200,000 | — | — |
| VRG15 | Life Sciences | € 3,200,000 | Computational Biosciences | – computational methods in the life sciences |
| VRG16 | ICT | € 1,600,000 | Complexity Science | – complex adaptive systems (social, biological or technological) + dynamic and structural properties<br>– inter/multidisciplinary<br>– quantitative, predictive and testable<br>– mathematical knowledge and methods as pre-requisite<br>– potential for applications |
| VRG17 | Mathematics and… | € 3,200,000 | Applicability of mathematical innovations | – innovative mathematical methods that aim at applicable solutions in and together with other disciplines<br>– strong applied mathematical base (and development of new methods)<br>– strong interdisciplinary approach |
| VRG18 | ICT | € 3,200,000 | — | – research questions in the field of ICT with potential medium term economic and social benefits<br>– ICT and its application fields<br>– from science, engineering and application fields |
| VRG19 | ICT | € 3,200,000 | Interdisciplinary Data Science | – data science that lead to applicable solutions in and together with other disciplines<br>– specific application cases<br>– new interdisciplinary combinations |
| VRG20 | Life Sciences | € 3,200,000 | Computational Biosciences | – computational methods in the Life Sciences<br>– application of computational methods in the LS<br>– address fundamental biological questions with the aim to develop new computational methods, algorithms, tools, concepts or models |
| VRG21 | Cognitive sciences | € 3,200,000 | — | – phenomena in cognition<br>– all fields and subdomains of the Cognitive Sciences<br>– in humans, animals and/or artificial cognitive systems<br>– incl. Neurosciences, brain research |

[25] "-" means that there was no further specification of the topic but it was a broad call in the named topic.

## 2. Detailed information on funding per topic

**Table 13: WWTF funding in Life Sciences, 2010-2020**

| | | | |
|---|---|---|---|
| Number of VRG calls | 4 | Number of applications | 71 |
| Number of persons funded | 10 | Number of reserve candidates | 8 |
| Number of female applicants | 19 | Number of female funded VRG | 3 |
| **Total of WWTF funding in VRG in this area** | | **€ 15,695,620** | |
| Overall average acceptance rate | | 14 % | |

**Table 14: WWTF funding in ICT 2010-2020**

| | | | |
|---|---|---|---|
| Number of VRG calls | 4 | Number of applications | 56 |
| Number of persons funded | 8 | Number of reserve candidates | 7 |
| Number of female applicants | 5 | Number of female funded VRG | 1 |
| **Total of WWTF funding in VRG in this area** | | **€ 12,432,570** | |
| Overall average acceptance rate | | 14 % | |

**Table 15: WWTF funding in Mathematics 2010-2020**

| | | | |
|---|---|---|---|
| Number of VRG calls | 2 | Number of applications | 46 |
| Number of persons funded | 4 | Number of reserve candidates | 4 |
| Number of female applicants | 6 | Number of female funded VRG | 1 |
| **Total of WWTF funding in VRG in this area** | | **€ 4,728,929** | |
| Overall average acceptance rate | | 9 % | |

**Table 16: WWTF funding in CI / CS 2010-2020**

| | | | |
|---|---|---|---|
| Number of VRG calls | 1 | Number of applications | 7 |
| Number of persons funded | 1 | Number of reserve candidates | 0 |
| Number of female applicants | 2 | Number of female funded VRG | 0 |
| **Total of WWTF funding in VRG in this area** | | **€ 1,499,466** | |
| Overall average acceptance rate | | 14 % | |

# 3. VRG jury statistics

**Figure 15: National distribution of WWTF jury members (nationality of jury members' institutional affiliation)**

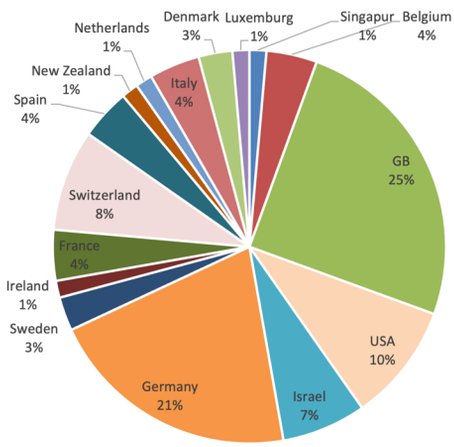
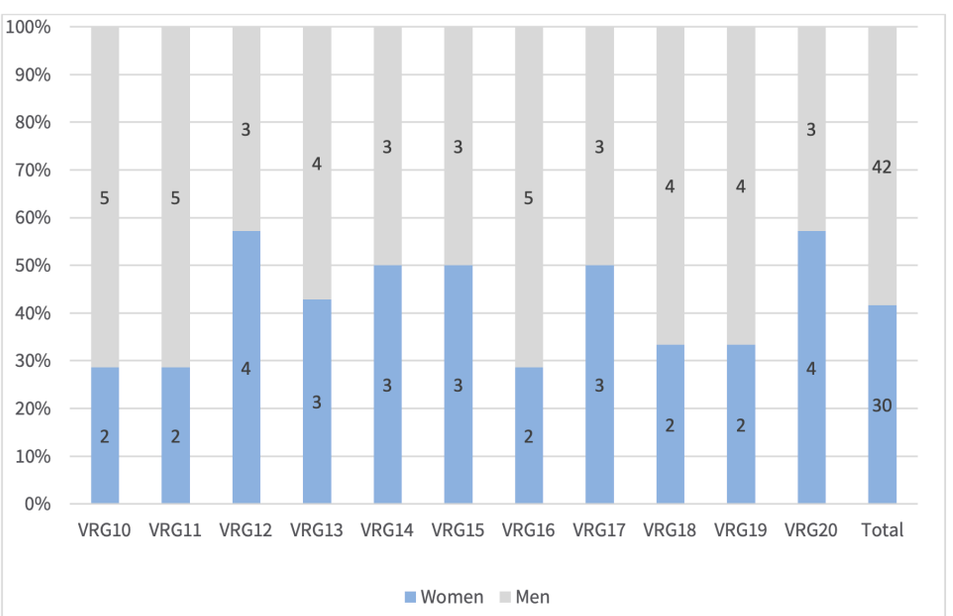



**Figure 16: Gender distribution of jury members**



## Glossary

| | |
|---|---|
| Call | Yearly call for proposals in funding programmes<br><br>*Wiederkehrende jährliche Ausschreibungsrunde in Förderprogrammen* |
| Jury | International jury appointed by WWTF for selection process of VRG candidates<br><br>*Internationale Juror*innen, die den VRG Auswahlprozess pro Ausschreibung des WWTF betreuen* |
| Host institution | Viennese research institutions that take search for VRG candidates, and in case of funding sign a long-term working contract with them<br><br>*Wiener Forschungsinstitutionen, die VRG Kandidat*innen aufnehmen wollen und an denen VRG Kandidat*innen in weiterer Folge angesiedelt sind* |
| Proponents | Mentors who are working at Viennese host institutions and are applying in tandem with the VRG candidate<br><br>*Mentor*innen, die an Wiener Host Institutionen angesiedelt sind und die sich im Tandem mit den VRG Kandidat*innen beim WWTF für das Programm bewerben* |
| VRG candidates | Young researchers who apply for the VRG program and have submitted their proposal<br><br>*Personen, die sich für das VRG Programm bewerben und einen Antrag stellten/ stellen* |
| VRG leaders | Young researchers who have received VRG funding<br><br>*Personen, die durch das VRG Programm ausgewählt und gefördert wurden/ werden* |
| (International review) panel | International expert panel for the evaluation of the VRG programm<br><br>*Internationales Expert*innenpanel zur VRG Programmevaluierung* |

## List of abbreviations of WWTF programs

| | | | |
|---|---|---|---|
| ESR | Environmental Systems Research | LS | Life Sciences |
| CS | Cognitive Sciences | MA | Mathematics and … |
| ICT | Information and Communication Technology | SSH | Social Sciences and Humanities in Vienna |
| VRG | Vienna Research Groups for Young Investigators | SC | Science Chairs (*Stiftungsprofessuren*) |

## List of frequently used abbreviations

| | |
|---|---|
| AAS | Austrian Academy of Sciences<br>*Österreichische Akademie der Wissenschaften* |
| AIT | AIT Austrian Institute of Technology GmbH<br>*AIT Austrian Institute of Technology GmbH* |
| BOKU | University of Natural Resources and Life Sciences, Vienna<br>*Universität für Bodenkultur Wien* |
| CCRI | CCRI Children's Cancer Research Institute, Vienna<br>*St. Anna Kinderkrebsforschung* |
| CeMM | Research Center for Molecular Medicine of the Austrian Academy of Sciences<br>*Forschungszentrum für Molekulare Medizin GmbH der ÖAW* |
| ERC | European Research Council<br>*Europäischer Forschungsrat* |
| FWF | Austrian Science Fund<br>*Fonds zur Förderung wissenschaftlicher Forschung* |
| GMI | Gregor Mendel Institute of Molecular Plant Biology of the Austrian Academy of Sciences<br>*Gregor Mendel Institut für Molekulare Pflanzenbiologie der ÖAW* |
| IMBA | Institute of Molecular Biotechnology of the Austrian Academy of Sciences<br>*Institut für Molekulare Biotechnologie der ÖAW* |
| IMP | Research Institute of Molecular Pathology<br>*Forschungsinstitut für Molekulare Pathologie* |
| LBG | Ludwig Boltzmann Society<br>*Ludwig Boltzmann Gesellschaft* |
| MFPL | Max F. Perutz Laboratories<br>*Max F. Perutz Laboratorien* |
| MUW | Medical University of Vienna<br>*Medizinische Universität Wien* |

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| UWien | University of Vienna<br>*Universität Wien* |
| VetMed | University of Veterinary Medicine, Vienna<br>*Veterinärmedizinische Universität Wien* |
| VUT | Vienna University of Technology<br>*TU Wien/Technische Universität Wien* |
| WU | Vienna University of Economics and Business<br>*Wirtschaftsuniversität Wien* |
| WWTF | Vienna Science and Technology Fund<br>*Wiener Wissenschafts-, Forschungs- und Technologiefonds* |

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