



# The international Rating of Medical Dissertations

## The ERC Experience

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Good Morning, Ladies and Gentlemen!

I like to thank the organisers of this symposium for the invitation. I will pick up an idea from my previous contributor and move to another part by expanding the discussion to the point where research is introduced. In medicine or in the biological sciences there is a great interplay between professional education and training which then supports basic treatment and health. On the other hand there is complementary training supported by the new findings in the medical sciences, but this is again very closely linked to the professional training of the individual doctors. Taken both together we have a much expanded horizon in the creation of new knowledge. This is where the difficulties start regarding research funding and the minimal requirements for applicants who apply to this type of funding.

Before I will share with you the experience of the European Research Council (ERC) regarding minimal requirements I will inform you on the structure and general principles of the ERC and give some updates about recent activities to those who know already the general facts about the council.

The ERC deals with "Ideas". In terms of scientific coverage, it is more than the equivalent for the National Science Foundation (NSF) and the National Institute of Health (NIH) in the USA, because it covers the whole range of scientific research. Its aim is to encourage and to support top talent in bring-

ing great ideas to life. The ERC supports in particular young researchers by encouraging them, by creating attractive career paths, and by creating a competitive "Champions League" that sets standards.

The ERC is very international and integrates and internationalises the research efforts. This is a radical shift in policy and a significant paradigm shift for Europe, since for the first time a pan-European competition takes place to advance excellent ideas of individuals. In that way professors from different countries in Europe or young scientists from member states of the European community compete for grants, but not at the narrower competition fields of the national levels. The ERC strongly emphasizes the support for excellent individual researchers to push the frontiers of science. It gives support for the early independence of young researchers. Industry participation is welcome (frontier technologies).

It is a very significant shift in European policy. Scientists or researchers from different countries in Europe compete for funding. We have an open competition and this is new for Europe. The excellence is the only valid criterion for being accepted in the funding program. Scientists are being judged on their scientific merit, on their track record, and on the excellence of their ideas.

The ERC supports excellence in frontier research through a bottom-up, individual-team, pan-European competition (Fig. 1). It was established under European legislation and it has scientific governance. In that way scientists are responsible for the scientific strategic decisions of the ERC.



Fig. 1: Contribution of the ERC to innovations



Fig. 2: Structure of the ERC

There are three main stakeholders, the ERC Agency, the Scientific Council, and the European Commission (Fig. 2). The ERC is a European Union initiative. Therefore, the funds come from the European Commission, i.e. from the member states of the European Union. The Scientific Council is responsible for the scientific strategy, and the ERC Agency executes the work programme, organizes the evaluations and carries out the communication activities.

The Scientific Council of the ERC (Fig. 3) is headed by Prof. Helga Nowotny, Vienna Science and Technology Fund (WWTF). There are German scientists among its members including a Nobel price laureate. The members are not however representing any member state and they cover a wide range of scientific disciplines.

- Prof. Claudio BORDIGNON (Medicine)
- Prof. Nicholas CANNY, (History)
- Prof. Sierd A.P.L. CLOETINGH (Earth Sciences)
- Prof. Mathias DEWATRIPONT (Economics)
- Prof. Tomasz DIETL (Physics)
- Prof. Daniel DOLEV (Computer Sciences)
- Prof. Carlos M. DUARTE (Biology)
- Prof. Daniel ESTEVE (Physics)
- Prof. Pavel EXNER (Applied Mathematics & Mathematical Physics)
- Prof. Hans-Joachim FREUND (Physics & Physical Chemistry)
- Prof. Carl-Henrik HELDIN (Molecular Cell Biology), ERC Vice President
- Prof. Timothy HUNT (Biology)
- Prof. Norbert KROO (Physics)
- Prof. Maria Teresa LAGO (Astrophysics)
- Prof. Henrietta L. MOORE (Social Anthropology)
- Prof. Helga NOWOTNY (Social Studies of Science), ERC President
- Prof. Christiane NÜSSLEIN-VOLHARD (Genetics)
- Prof. Alain PEYRAUBE (Linguistics)
- Dr. Jens ROSTRUP-NIELSEN (Chemistry)
- Prof. Mart SAARMA (Biology)
- Prof. Anna TRAMONTANO (Biochemistry)
- Prof. Isabelle VERNOS (Molecular Biology)

Fig. 3: The ERC Scientific Council Members (renewed 1 February 2011), orange color indicates German members

The funding system in the ERC is very simple. There are only two categories, namely starting grants and advanced grants (Fig. 4, based on the 2010 Starting and Advanced Grant calls). The first one is for young scientists at the beginning of their scientific careers, the second one for those scientists who are already recognized and have received scientific merits.

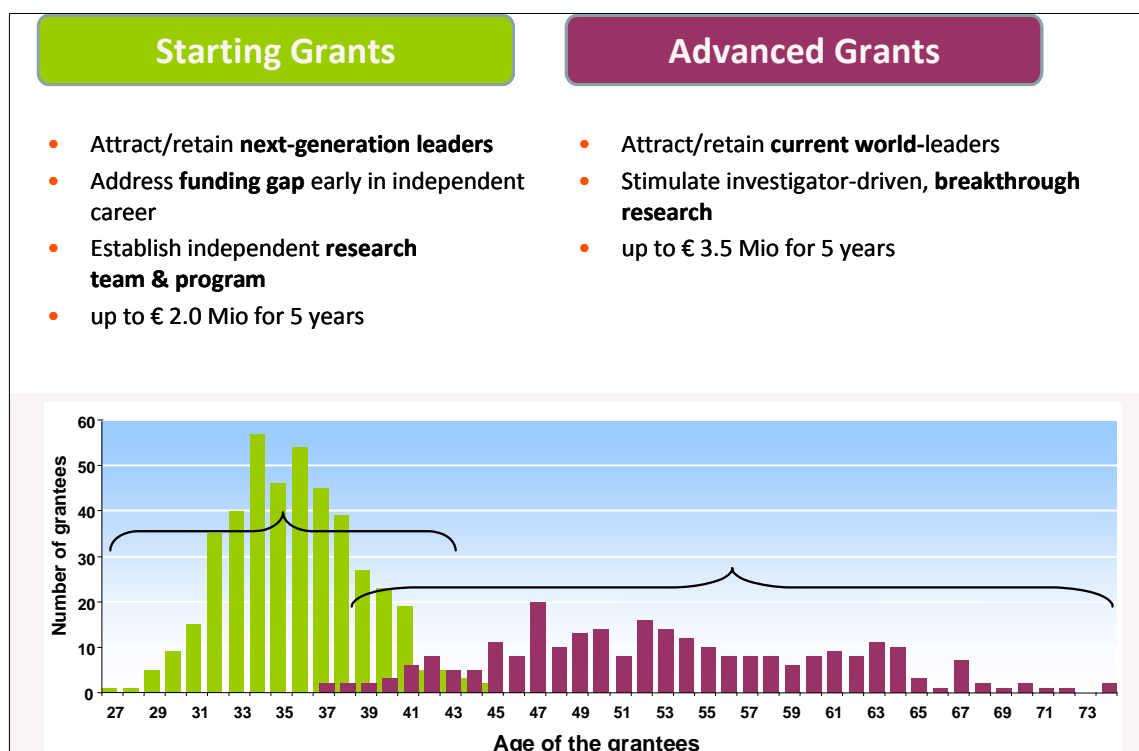


Fig. 4: ERC granting schemes

The young researchers at the left side of the diagram in Figure 4 are typically between two and twelve years after a doctoral degree. The advanced grants span from established scientists to very senior people, who are still at the leading edges of scientific research.

The relevance of this Figure for today's conference is in the left part of the diagram, namely the young scientists. A typical profile for an applicant for a Starting Grant shows a potential for research independence, the evidence of scientific maturity, and at least one publication without participation of PhD supervisor. There should be a promising track-record of early achievements, i.e. significant publications, invited presentations in conferences, and/or

funding, patents, awards, prizes. For practical purposes and to assure a fair competition two specific stages of the research career at time of application divide between starters (2 - 7 years after the doctoral degree) and consolidators (7 - 12 years after the doctoral degree).

The diagram published two years ago by The Royal Society (Fig. 5) shows the different career paths that may be correlated to the different ages of application to ERC grants.

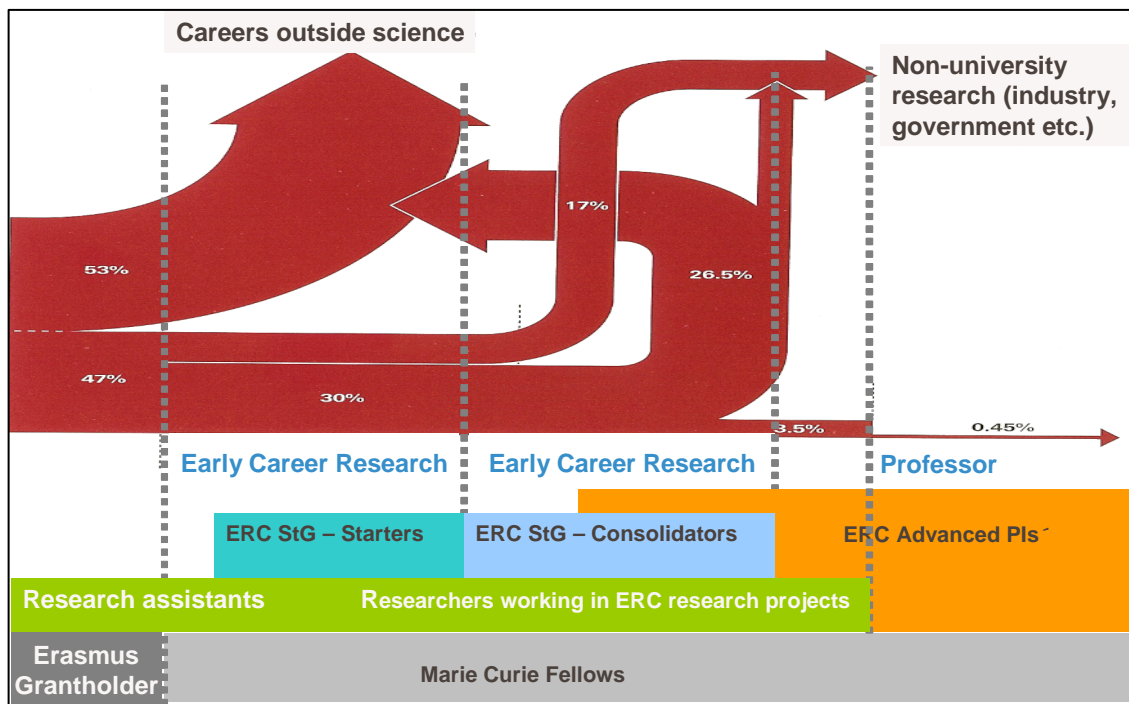


Fig. 5: The Royal Society 2010: The Scientific Century securing our future prosperity

As can be seen in this diagram, the ERC gives funding only to a small part of those people, who starts a scientific career. Most of them, who received scientific training, have already left the universities when the ERC granting possibilities start. Only very few of them can apply for the ERC Advanced PIs.

The highly competitive nature of the ERC funding is depicted in Figure 6. The success rate is typically about 10 %. The distribution of the grants is shown in Figure 7 in the same colour coding. Medicine and medical sciences are subsumed in the Life Sciences in both diagrams.

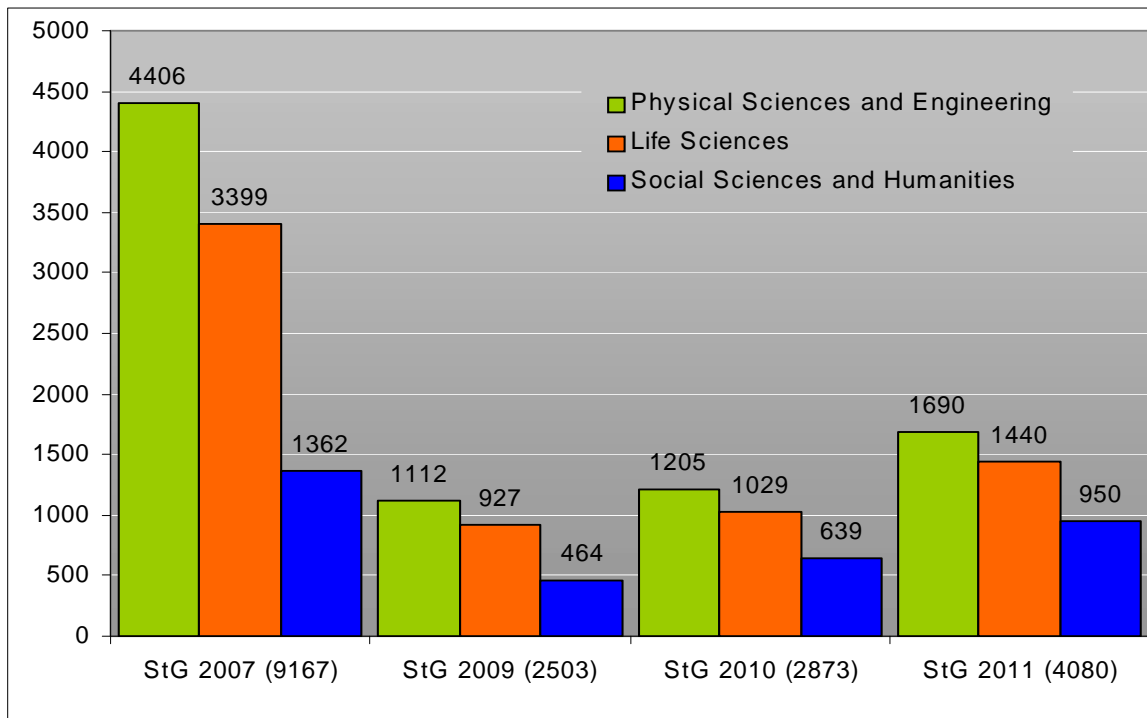


Fig. 6: ERC Starting Grant calls 2007 – 2011; Submitted proposals by domain

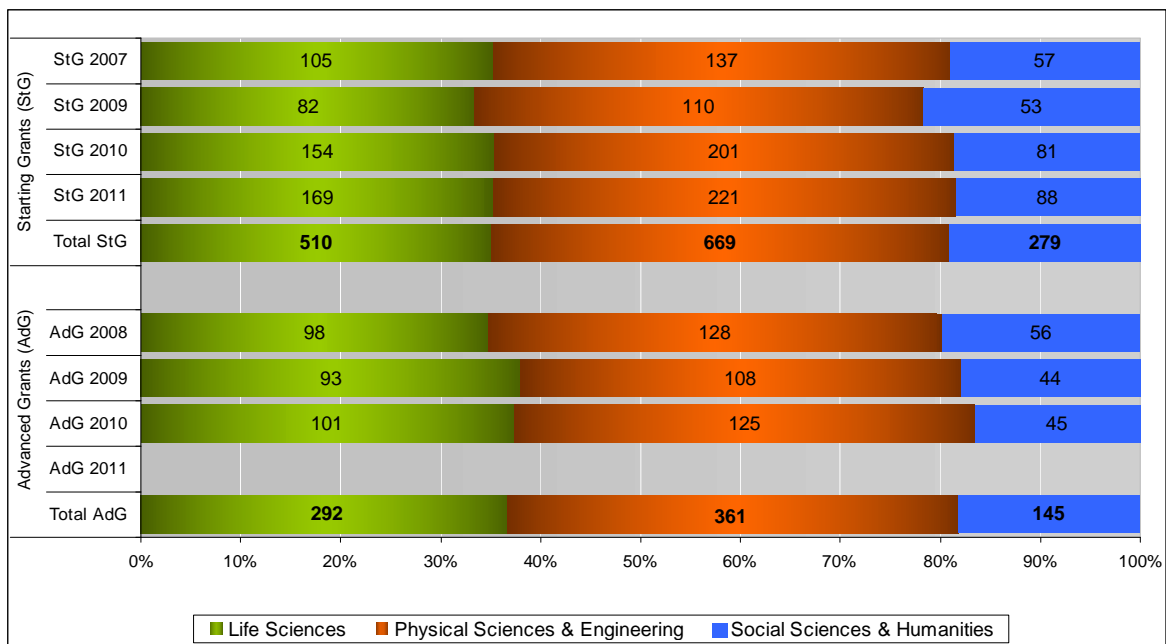


Fig. 7: Funded Projects by Scheme, Call and Domain

Some recent data for the European competition by country of hosting organization are summarized in Figure 8.



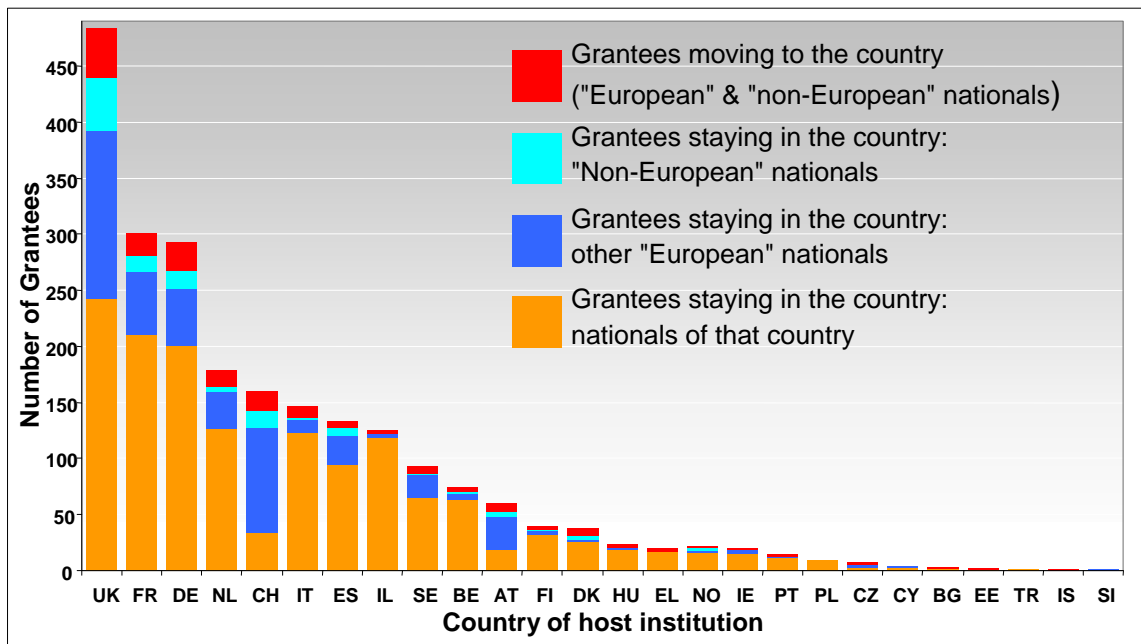


Fig. 8: Origin of Grantees, ERC Starting & Advanced grant calls 2007 – 2011; Starting Grants 2007-2011, Advanced Grants 2008-2010

There also can be seen that some countries seem to be more attractive for scientists than other countries, e.g. the U.K. or Switzerland. On the other side, e.g. in Italy or in Israel most of the successful applicants come from the countries themselves. In Germany the percentage of German scientists who successfully applied for ERC grants is relatively high, although there are also scientists from different nationalities being hosted in German universities and research organizations.

A further illustration of the bottom-up competition is given in Figure 9 with the list of universities hosting at least 14 ERC grants. It should be mentioned that German medical research is not only performed at universities but also in research organizations, such as Max-Planck-Groups in Germany, similar as in France in the CNRS or in INSERM. The numbers of grants amounted to CNRS 119, MPG 54, CEA 28, and INSERM 27.

Higher Education Institutions					
Institution	Total number		By domain		
	No.	Grants	SH	PE	LS
University of Cambridge	1	67	8	36	23
University of Oxford	2	60	14	27	19
Swiss Federal Institute of Technology Lausanne (EPFL)	3	48	1	35	12
Hebrew University of Jerusalem	4	41	8	17	16
Weizmann Institute	5	38	1	17	20
University College London	6	37	14	7	16
Swiss Federal Institute of Technology Zürich (ETH)	7	36	0	20	16
Imperial College	7	36	0	23	13
University of Helsinki	8	21	1	6	14
Catholic University of Leuven	9	20	4	9	7
University of Zurich	9	20	4	3	13
University of Amsterdam	9	20	13	7	0
Technion - Israel Institute of Technology	9	20	0	13	7
Karolinska institute	10	19	1	0	18
University of Munich (LMU)	10	19	4	8	7
University of Edinburgh	10	19	7	7	5
University of Leiden	10	19	8	10	1
University of Bristol	10	19	1	13	5
Free University Amsterdam	10	19	10	6	3
Radboud University Nijmegen	11	18	7	5	6
Rijksuniversiteit Groningen	12	17	5	8	4
University of Vienna	12	16	4	8	4
University of Utrecht	13	16	4	7	5
University of Heidelberg	14	15	2	7	6
TU Munich	14	15	0	10	5
University of Geneva	15	14	1	4	9
University of Aarhus	15	14	1	8	5
University of Manchester	15	14	2	7	5
University of Lund	15	14	2	7	5

Fig. 9: Top 15 European Universities hosting at least 14 ERC Grantees by funding Schemes; StG 2007 - 2011, AdG 2008 - 2010

The growing number of grants hosted by these universities leads back to the topic of the conference – it is a question of training, of recognition and qualification of individuals in the research process. Some institutions are quite successful because of tradition, and of adaptation to modern methods of education and research. Through this open competition between European researchers some universities become more and more attractive to young scientists.

Despite the relative absence of many German universities in this list, it is important to emphasize that the Max-Planck-Institutes and other German research institutions who are partners of university faculties are hosting a significant number of Principal Investigators with their teams. However, the Anglo-Saxon model of research universities together with Switzerland and Israel seem to be more attractive for young scientists than others.

I was asked to comment on the question of the German Dr. med. and application to ERC grants and on quality and recognition of qualifications. It is still a point of debate in Germany. The ERC was somehow involved in this debate on the quality of the Dr. med. in Germany.

I start with the policy on recognition of the minimal qualification for application to scientific grants. We looked at examples all over the world, e.g. in the U.K., in Germany, and in the United States:

**MRCs Young Investigator Award:** *Applicants must be based at a UK institution and hold a PhD, DPhil or an MD. They should either be at the start of their first lecturer appointment (they must be aiming for a research board deadline which falls within the first three years of taking up the post) and have a minimum of three years post qualification research experience or be in a senior post-doctoral (non-lecturer) position and have between three and ten years post qualification research experience.*

**DFG's Emmy Noether Programme:** *eligible applicants should have an excellent doctorate and who have also established a very strong scientific track record (including publications in respected international journals or other comparable publications) are eligible to submit proposals. As a rule it requires the applicant to have at least two years of postdoctoral experience prior to the DFG award. MD degrees are accepted\* and 2 extra years are added to make up for the more limited research experience.*

*\*Although this scheme requires a doctorate, some of the applicants turned ineligible by ERC have been awarded an Emmy Noether post-doctoral fellowship*

**National Institute of Health (NIH):** *The Postdoctoral Visiting Fellowships provide the opportunity for recent doctoral degree recipients to enhance their research skills in the resource-rich National Institutes of Health (NIH). Eligible applicants must have a doctoral degree or equivalent in the health sciences and not more than five years of relevant*

*postdoctoral research experience at the start of the fellowship period. MD degrees are accepted.*

It is also possible to find other medical research institutions that offer post-doctoral fellowships for applicants with a Ph.D. and/or M.D. degree, such as:

**American Institute for Cancer Research:** *Post-Doctoral Grant Awards are designed to encourage new researchers to enter the field of nutrition-cancer research. Individuals with an MD, PhD or DVM, who are basic scientists, and who have completed at least two years of postdoctoral work are eligible to apply.*

When we sent out our first proposals, some of the German applicants had to be rejected, though they had applied successfully to the Emmy-Noether-Programme. It was realized that there was a divergence in recognizing medical research qualifications between the ERC and national research funding organizations.

From 2007 the ERC provisions stated *"For medical doctors, an MD will not be accepted by itself as equivalent to a PhD award. The ERC Scientific Council has decided to accept as eligible applications from medical doctors who have concluded both basic studies (MD) and a research doctorate or clinical specialty training. Candidates must also provide information on their research experience in order to further substantiate the equivalence of their overall training to a PhD..... For medical doctors who have been awarded both an MD and a PhD, the date of their PhD award takes precedence in the calculation of the eligibility time-window (2 - 9 years after PhD)."*

In this provision the ERC had decided to the Anglo-Saxon model where MDs are not being automatically accepted to apply for a research grant, except if they have received a Ph.D. This rule was very easy to check, but it missed some specificity of some national systems. People with MD and clinical speciality training were considered, provided evidence of research experience. However, such a solution was sub-optimal for a specific group of applicants – German medical research doctors, i.e. people who received the Dr. med. and perform scientific research.

Following the national debate in Germany there came some complaints from German research organizations, including the DFG. At the same time the ERC council looked at the applicants and looked for the numbers of applicants who really seemed to be discriminated. We saw that this number was very small. At the same time there was a report in Germany by the Wissenschaftsrat in 2009 (the Beisiegel-report) stated that about 10 % of the medical dissertations (Dr. med.) were good enough to apply successfully for an ERC or similar grant.

As an example, in 2010 and in the Life Sciences domain, around 20 % (221 cases) of the proposals submitted went for discussion to the eligibility committee, of which 25 % (56 cases) were due to problems to assess the equivalency or eligibility of MD candidates in six Life Science panels.

At the end 10 applicants did not have a research doctorate (i.e. no PhD nor a "Habilitation") or clinical specialty training certificates with significant research experience. However, several of these candidates were in professor positions in prestigious research institutions, which normally require a "Habilitation" or "Habilitation-Equivalent" achievements and had a solid track-record including several publications as first or senior authors in prestigious journals with high impact factors (i.e. Science, Nature, Cell).

In addition, four applicants with a research doctorate (i.e. "Habilitation") or clinical specialty training certificates and adequate proof of a consolidated research experience (several publications in high impact factor journals), but were outside the eligibility window as their certificates were obtained less than 2 years from the date of the call.

To further adjust and focus their strategy, the Scientific Council of the ERC decided to slightly revise the text in order to expand the eligibility from 2011 onwards:

*"For medical doctors, an MD will not be accepted by itself as equivalent to a PhD award. To be considered an eligible Principal Investigator medical doctors (MDs) need to provide the certificates of both basic studies (MD) and a PhD or completion of clinical specialty training or proof of an appointment that requires doctoral equivalency (i.e. post-doctoral fellowship, professor-*

*ship appointment). Additionally, candidates must also provide information on their research experience (including peer reviewed publications) in order to further substantiate the equivalence of their overall training to a PhD. In these cases, the certified date of the MD completion plus two years is the time reference for calculation of the eligibility time-window (i.e. 4 - 14 years past MD).*

*For medical doctors who have been awarded both an MD and a PhD, the date of their PhD award takes precedence in the calculation of the eligibility time-window (2 - 12 years after PhD)."*

The exact rules have been given to the potential applicants also in a German text version (<http://www.euburo.de/erc-gewusst.htm>):

*"Bin ich als Dr. med. (oder MD) antragsberechtigt bei den Starting Grants?"*

*Bei den ERC Starting Grant ist ein PhD oder ein äquivalenter Titel Voraussetzung für die Antragstellung. Ein medizinischer Doktorgrad (MD oder "Dr. med.") wird nicht als PhD-äquivalent anerkannt. Daher müssen Mediziner/innen zusätzlich zum medizinischen Doktorgrad einen der drei Nachweise erbringen:*

- PhD*
- Abschluss eines Facharzt (bzw. 'Clinical Specialty Training')*
- Nachweis über eine Position, die einen PhD-äquivalenten Titel erfordert (z.B.: "Post-Doc-Fellowship", Professur)*

*In den letzten beiden Fällen wird das Zeitfenster zwei Jahre nach hinten verschoben und gilt von 4 bis zu 14 Jahren nach Erhalt des Dr. med. bzw. MD (entsprechend gilt: 4 - 9 Jahre "Starter" und 9 - 14 Jahre "Consolidator"). In dem Feld "Date of first PhD (or equivalent) degree" im EPSS muss dann das Datum des Dr. med. bzw. MD plus zwei Jahre angegeben werden. Bei einem zusätzlichen Doktorgrad in einem anderen Fach, gilt dieser zur Berechnung des regulären Zeitfensters (2 - 12 Jahre nach PhD). Eine Habilitation wird nicht als PhD-äquivalent anerkannt.*

*Der Nachweis von Forschungserfahrung (insbesondere: "peer-reviewed publications") im Lebenslauf ist in jedem Fall erforderlich."*

The positive side of this debate from the view of the funding agency is that the outcome is in favour of the people who have scientific merit in their scientific careers. On the other hand this debate had a positive effect on the academic environment since it had fuelled the thinking on quality in academic research and graduation. We hope to support the scientific community for many years.

The ERC is formed to support excellence and framework conditions for research from individual to institutional excellence. It is committed to scientific excellence while helping dynamic institutions that successfully attract high-level researchers. The ERC is raising standards throughout Europe and acts as a catalyst for reforms in research funding policies in Europe.

Thank you!