Challenges for European Science

An interview with Ernst-Ludwig Winnacker, President of the DFG, Germany's largest scientific funding agency

EMBO reports (ER): You have been an outspoken supporter of the European Research Council and proposed that it should be funded initially by the national research councils. Would this not compete with their own work?

Ernst-Ludwig Winnacker (ELW): First of

course, will create added value for the persons who obtain these fellowships because it will add to their *curriculum vitae* and their reputation. It will also have a positive effect on the national situation as it will show the national councils how well their selection processes are func-

organise and prepare reports on science and society issues and so on. But it does not work like a research council, although it could in principle. And I don't quite see why it shouldn't.

ER: Do you think a European scheme should be something specifically for younger scientists to encourage them to stay in Europe?

ELW: It is designed for younger scientists so that they return from their post-doc position overseas to wherever in Europe they think they can find the best conditions for carrying out their research. The idea is to offer them actual independence by paying them a decent salary and on top of that offering them money to cover expenses linked with their research projects, for example, for staff, equipment and travel. I could envisage a sum of €300 000 per year and a fellowship. The annual total number of grants across all disciplines would be around 30–50, and the money initially would come exclusively from the participating research councils. The next step will be to find out whether funds can come from other public sources, including the European Union, but we need a process that is not based on the principles of the European Union but on scientific principles.

ER: Would this be exclusively for European researchers?

'My vision of a European Research Council is rather that of a Greek temple whose columns are the national research councils and whose roof is the European council'

all, the European Union funds only 4–5% of the money spent on research and development in Europe, and according to their rules, much of this goes to industry. The national research councils fund close to 40% of research and development. A European Research Council would be rather small in comparison. I don't think our vision is a single European Research Council to replace all the existing ones. There are a lot of projects that do not gain added value if you alter the review base. My vision, if I may use an image, is rather that of a Greek temple whose columns are the national research councils and whose roof is the European council. We are currently in the process of identifying areas of research that would gain from funding on a broader base, and one field we have agreed upon so far is 'young investigators'. Instead of picking the 30 best German historians or molecular biologists or engineers, we would broaden the pecking order so to speak, and by selecting from pan-European scientists, we would have a wider group from which to choose the best. I think it has to be a scheme that has none of the boundary conditions attached that the commission often applies, such as regional preferences and all kinds of political aspects. It has to be a bottom-up process based solely on scientific excellence, which, of

tioning or how attractive the national research conditions are for young people.

ER: Do you expect this to take place in the near future?

ELW: Yes, the heads of the European Research Councils already decided in April 2002 in Madrid to do this, and to create a two-tier scheme. In a first step, the national councils select candidates and in a second step the winners among these candidates will be selected by a European panel. Such a panel will not necessarily be created especially for this purpose, rather the idea is that one of the existing European institutions, boards or committees should take over that task. There are already so many science administrations in Europe that we don't want to spend money on creating a new one. Let me briefly look at a couple of

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schemes. EMBO obviously has a great track record in selecting post-docs. The European Science Foundation as such has no similar experience, but it is supported by the research councils as its member organisations and is, in a sense, their executive arm. It basically provides a platform where people meet, discuss,

ELW: No, it would be for researchers wishing to work in Europe. It could be for an Australian working in Copenhagen, but not for a European working in the USA.

ER: While the scope and aims of an ERC are being discussed, the DFG itself is changing too. After more than 80 years,

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the DFG is now restructuring its peer review system to officially include outside experts in addition to its board of traditionally elected referees. Why was there a need for such changes and what do you expect from them?

ELW: The old system was established in the 1920s by Fritz Haber and other scientists. It was structured in such a way that the academic community elected groups of scientists for 4 years to review grants in a particular field. After World War II it gradually became more and more clear that, although this system sounds very democratic, there were simply not enough elected members to review all applications, and by the 1990s the DFG had to select thousands of additional reviewers. Through this practice a mechanism evolved, which uses basically two types of reviewers: those who review the grants, and those who evaluate the reviews and then make a judgement. The statutes have been adapted to this development and we now have a system whereby incoming grants are reviewed first and then the group of elected scientists makes the decision proposal for the Grants Committee.

The other thing is that the traditional system did not cover coordinated funding, e.g. the so-called *Sonderforschungsbereiche* or collaborative research centres, where larger groups of scientists write a grant application together. The problem is that different disciplines have

developed different standards in measuring excellence. The new scheme now permits the elected scientists and scholars to participate in reviewing the larger collaborative grant applications and thus ensure that individual and coordinated grant applications are reviewed according to the same standards.

ER: Do these large schemes include pan-European cooperation?

ELW: That is possible because we have opened most of our instruments and hence reviewing processes to international collaboration, usually on the basis that each participant organises their own funding nationally, but there are exceptions.

‘Science is probably the only source that drives innovations in many ways’

ER: Will these changes also increase the transparency of the review system?

ELW: Yes, the new process will be quite transparent because we will publish the names of the selected reviewers for a given field. The peer review system is certainly not perfect and undoubtedly very conservative. But by applying the necessary checks and balances, we hope that creativity and innovations are recognised and funded and that this will make the new scheme easier to work with. We will see. We will not start before next year

anyway because it takes a year to prepare the new elections.

ER: Will there be more elected reviewers?

ELW: The exact number has actually not been decided on yet. Ideally, it will be in the 600s so as to have at least two reviewers for every field. Since the DFG's responsibility spans the whole scale of research fields in science and the humanities we have to make sure that all disciplines are adequately represented among the elected reviewers. The selection of fields from which we elect scientists is a bottom-up process not determined by the head office, but rather by the respective academic communities. If specialists review grant applications from specialists there is always the danger of seeing no further than one's nose and neglecting the question of whether a grant would survive in a broader context. Therefore, I hope that we will only have a relatively small number of reviewers for each field, so that interdisciplinary aspects could be taken care of by a panel of elected reviewers from related fields.

ER: How will this ensure that you can react to completely new research fields?

ELW: First of all, as the initial reviewers are not elected, the elected members, together with the DFG office, are free to choose any scientist or scholar whom they deem the most appropriate reviewer for an application in a new field. In addition, elections take place every 4 years, which gives the community the flexibility and freedom to select new reviewers or re-group subjects and disciplines according to necessity. I think a 4 year election cycle is fine. We would be able to take care of bioinformatics within that period, for example, if it came up today.

ER: New research fields obviously need to be funded in addition to the established ones. The EU member states have decided to increase their overall spending on research and development in Europe to 3% by 2010. Do you think that this is a feasible goal?

ELW: I think they have to reach this goal. By now almost everybody has recognised how much innovation really comes out of science. It is probably the only source that drives innovation in many ways, and therefore we simply have to reach this goal. Many countries are far away from this. In Germany, for instance, we will probably need to add several billion Euros per year to the science and development budget. We also have to see that at least

two-thirds of this money comes from industry. So it's not only public spending that has to be increased but European industry also has to make an effort to increase its share of R&D expenditure, too. But it will be even more critical for public funds because that is how we fund the education and training of our scientists.

ER: But in Germany the contribution of industry has actually been decreasing over the last few years.

'You cannot bring science to the marketplace if it's not fun'

ELW: It has decreased—you only have to read the newspapers about the crisis on the stock market. But actually, in the last 2 years it has been increasing again, albeit from a lower level because it did decrease in the 1990s. I think in the last year in Germany it increased by 6 or 7%. But from a low base. Too low a base.

ER: You said two-thirds of this funding should come from industry. Would you welcome an even higher share or should public spending increase instead?

ELW: Public spending has to be a big portion of this. I only wanted to stress that these numbers do not only apply to public spending. The fact is that we also need a strong commitment from the economic sector where there is maybe too much emphasis on the development part of R&D. My plea extends not only to the governments to provide more public funds, but also to industry to put much more of their funds into research rather than into development.

ER: Is there an overall strategy in Europe to increase R&D spending to 3%? For some countries that seems quite a challenge.

ELW: The *Neue Züricher Zeitung* reported recently that Switzerland is going to double the money for the Swiss National Science Foundation by 2008. Whether they can achieve this is not clear yet, but it is on the agenda. Several weeks ago, the British Prime Minister Tony Blair gave a speech at the Royal Society in London, making strong commitments towards a substantial increase in research funding. In the meantime, the numbers are on the table. On average, it's 10% or so for the various research councils of the United Kingdom. I have not heard commitments yet from the parties fighting for an election in Germany, but the goal of 3% is on everybody's mind.

ER: One aspect of the public funding is accountability and the public is expecting something from the money that goes into science. How should scientists react to this?

ELW: It's a big danger that people expect too many immediate returns from scientific research so we all have to be very careful in explaining the need for more funding and not make promises that we can never fulfil. This has been particularly obvious in genome research and in the stem cell debate. I think it's increasingly important for all of us to explain that there's a positive serendipity involved and only if you allow this process to happen will we get the products that everyone wants. If you look back in history, I don't think Alexander Fleming put in a grant application with the aim of discovering penicillin. RNAi, which has become such an important method in creating knock-out mutants, was found by chance. It was found by looking at obscure enzymes and fungi, which nobody was interested in except for a few people who thought them worthwhile studying. We have to have a rather broad base and we have to explain this to the public.

ER: Do you think scientists therefore should be more engaged in public debates and in politics?

ELW: Politics, I am not so sure. I think we have to expose our goals and our methods as much as possible and as fairly as possible. We are spending a lot of public money. But we have to explain our work both impartially and in an appealing way, otherwise no one will listen. You cannot

bring science to the marketplace if it's not fun. We have to compete with all the other players who bring good bread and fresh strawberries to the market, so our products have to be very fresh too.

ER: You have been a prominent figure in German science politics since the early debate about gene technology and, more recently, in the stem cell debate. Why have you been so forthcoming in calling for not only the import but also the generation of human embryonic stem cells in Germany?

ELW: In the late 1980s I was fighting for strong legislation to protect the human embryo. I continue to believe that a human embryo is much more than just something to buy or sell and then use and throw away. Nevertheless, I think that the requirements of basic research and, in particular, embryology have come so far that we can understand certain developmental processes, and in order to do so we need to have all the available tools. Many people say, 'Just work with adult stem cells,' because they are already used in medicine and many politicians think there is no ethical problem with them. But the fact is, in order to understand them and their position in a developmental process, we have to understand cell types with a much broader potential. Why do embryonic stem cells proliferate, whereas adult stem cells very rarely do? At this early stage it would be highly detrimental to close the door on one particular idea and on one particular tool. That is the idea behind the effort to convince the

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public to give very selective permission to use human embryonic stem cells. That is to say—only research with stem cells generated from surplus embryos—embryos

further, but at the moment this is not necessary.

ER: Would the DFG particularly encourage research that was based on estab-

lished embryonic stem cell lines? I hear from the people working in this field that there are enough cell lines around to at least get going. We'll see what happens.

ER: Eventually would you have to ask for changes in legislation?

ELW: It depends. If the existing cell lines don't work, we will have to ask for permission to import stem cells that were generated after January 1, 2002. I am not an embryonic stem cell scientist so it's hard for me to know exactly what the status is, but I hear that it can be done.

ER: Do you enjoy being engaged in this political process as a scientist?

ELW: Off and on, sometimes. It's part of the job and I never complain because I agreed to do it. I feel like the guy who falls down from a 100-floor skyscraper and someone on the 60th floor looks out of the window and asks him, 'How are you feeling?' I'm still feeling good.

ER: Professor Winnacker, thank you for the interview.

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lished embryonic stem cell lines? that will not be used for reproductive purposes.

ER: Was the intense debate a surprise for you?

ELW: There were some extreme situations, which I certainly will remember. In general, the German parliament made great efforts, and for the first time they took 3 days to discuss issues of molecular biology, stem cell technology and developmental biology, which was quite an experience. Many members got involved in scientific issues for the first time, and I think this is in itself a step forward. The current legislation, of course, is not perfect, but we will have to work on this. We are not the only country that is having difficulties in this respect—these things are discussed everywhere, including the United Kingdom. We will now have to wait and see if the field really evolves and if some of the promises are fulfilled. Eventually we will have to develop legislation

lished embryonic stem cell lines?

ELW: We are a bottom-up organisation, so if people apply for grants, these applications are reviewed on the basis of scientific excellence. We have a funding instrument called *Schwerpunktprogramm*, a coordinated funding programme where people in the entire country can work on specific goals, and the DFG Senate has approved such a programme for stem cell research in the order of magnitude of €2 million per year. Most of the projects use adult human stem cells, by the way. Outside of this programme we have many other individual grant projects where people work with adult stem cells.

ER: Are you content with the current legislation that imposes strict regulations on the import of stem cell lines?

ELW: When we originally proposed this, we indeed included a strict overseeing process. We'll have to wait and see how it evolves. It depends now whether the cell

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