Beyond an ERC

A European Research Council might soon become a reality. However, it would not necessarily solve all, or even most, of the problems in basic research in Europe.

It might not be long before one of European scientists' dearest wishes comes true: the creation of a European Research Council (ERC) to support basic research. If the European Commission (EC) sticks to its word, it will propose, during the discussion for the 2007–2011 budget, a massive increase in funds for research, along with the creation of an ERC to dispense money for fundamental research. Not only has this 'brainchild' of the scientists been fully embraced by the EC, but it has also met with largely positive responses from European ministers for research and even various heads of governments (Breithaupt H (2004) Push for innovation. *EMBO Rep* 5: 339–341). "The ERC was at some point a heresy but it is now an accepted part of the solution," said Jean-Patrick Connerade, President of EuroScience, referring to the evolution of the ERC over the past 3 years. This became obvious at the recent conference on an ERC, which was organized by the newly founded Initiative for Science in Europe (ISE) at the United Nations Educational, Scientific and Cultural Organization (UNESCO) headquarters in Paris, France. Whereas at the same location 20 months ago, the European Commissioner for Research, Philippe Busquin, adamantly refused to use the term 'ERC', this time it fell to Achilleas Mitsos, Director General of the EC's Directorate-General for research, to defend the ERC, its autonomy and its scope against other competing interests.

But not every detail has been worked out yet and not every possible roadblock on the way to an ERC has been removed. It is still not clear what the legal setting for an ERC will be—whether as an executive

agency of the EC, as a so-called 'article 171' organization set up by the EC with a governing board of representatives from national governments, or as a new truly European institution that is not accountable to, or dependent on, either the EC or individual governments. This issue will predominantly affect the autonomy of a future ERC, and, particularly, whether it will be at 'arm's length' from the EC and other political influences. Another important question is the budget. Although the figure of €2 billion has been tossed around in various debates, Mitsos warned that the eventual outcome might be significantly lower. "We have a real problem here, the insufficient means," he said. "Don't assume that only because the commissioner said it, you will get this increase in money," because that is up to the Council of Ministers and the European Parliament to decide.

Even more important is the question of whether an ERC would be enough to solve some of the most persistent problems that plague scientific research in Europe and hinder its international competitiveness. These include: gerontocratic hierarchies in the universities and research councils of many countries that resist any change; the lack of positions and independence for younger scientists; political interests that interfere with scientific agendas; the dismal state of universities in many countries; and the lack of coordination at the European level. Taken together, these problems have convinced more than 450,000 young researchers from Europe that they are better off in the USA. "The world is not standing still while we talk and Europe has in the meantime successfully balkanized its research," Connerade commented. In addition, Europe faces increasing competition from other areas of the world that are rapidly catching it up. "I am afraid the decision to establish an ERC will not be taken in 25 European capitals

but in China, India or the USA," said Peter Nijkamp, Chairman of the Netherlands Organization for Scientific Research (NOW) in The Hague. "We have known about the problem since the 1970s but nothing happened."

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The extent of the problem was further supported by Andrew Dearing, Secretary General of the European Industrial Research Management Association (EIRMA) in Paris, France, who complained that it was embarrassing for industry representatives to tell their American colleagues and politicians that there is no organization in Europe that is responsible for basic research at a European level. The ERC might change this, but Mitsos warned of several obstacles that might still hinder its realization. A confused agenda, soft consensus on important details and artificial divergence on others might lead to something other than what the scientific community wants. Another problem that he highlighted was oversimplification, through making a clear division between basic and applied research, and demanding that excellence should be the only decisive factor for handing out grants. Last, but not least, money remains an important problem. "We have here a major difficulty ... and that is that the Lisbon agenda has not been followed by means," he said. "You know, there are two discussions: one among the research ministers and one among the finance ministers. The one

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among the research ministers goes very smoothly."

While an ERC moves closer to reality, other players in the European research system are also staking their claims in this new funding mechanism. The Association of European Heads of Research Councils (EUROHORCs) has submitted a document to the EC that lays out its vision of an ERC. Nijkamp presented these recommendations at the Paris conference, which prompted Julio Celis, Secretary General of the Federation of European Biochemical Societies (FEBS), to question whether the EUROHORCs were appropriate representatives for the scientific community. Most of their recommendations were in line with the demands of the scientists, but the comments made by Nijkamp on how to avoid oversubscription of an ERC—by introducing national quotas, by a *de facto* return to the dreaded *juste retour* principle, by considering the publication and prize records of an applicant, which would predominantly favour senior scientists, or by focusing on selected research topics, which would completely counter the demand that an ERC should be open to all sciences—along with his hints that autonomy would not be absolutely necessary, prompted various sharp rebukes from the floor. "We must not even think of some sort of influence by politicians on the research agenda," Mitsos reprimanded. "The EC will never propose an ERC that is not autonomous, based on excellence and has national quotas."

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Even more emphatic was Barry Holland from the Université Paris-Sud, France, who sharply attacked Nijkamp—calling the EUROHORCs 'Eurohawks'—and claimed that this was exactly the mindset that has led European research into its present dismal state. Instead, he proposed that an ERC should focus its efforts on younger people and liberate their neglected scientific talent. "National

governments miserably failed to support young researchers," Holland said. "An ERC would be a wonderful opportunity to address this problem that national governments and research councils cannot do."

Although the national research councils, as represented by the EUROHORCs, are clearly worried about losing influence on the European research agenda, universities face even greater challenges. Eric Froment, President of the European University Association, was unsure of his role when presenting the views of his organization on an ERC. It became apparent from his talk that universities do not yet know how to face the fact that ERC grantees would be independent of university funding. Moreover, although he acknowledged that universities as institutions need to improve, Froment was not able to tell the audience how they could do so. His presentation prompted an Italian delegate to the conference to comment privately that it is exactly this mindset at many European universities that hinders any progress.

A more sober analysis of how an ERC will impact the European research scene came from Ernst-Ludwig Winnacker, President of the Deutsche Forschungsgemeinschaft (Germany's largest research council) and Chairman of EUROHORCs. Acknowledging that an ERC would have an impact on national research councils, he warned that it should neither ignore nor attempt to replace national funding. An ERC with a budget of €2 billion would still pale in comparison to the funds that are spent through national research councils, which directly invest about €18 billion in basic research, or around €40 billion if indirect investments are also taken into account. "And this far exceeds the budget of the EC," Winnacker said. Instead of replacing them with a European funding mechanism, an ERC should instead focus on areas where national research councils are less strong, to avoid doubling efforts. "Careful thought must be given to the relationship of an ERC with existing councils," he commented. "They have to help. They have to set the standards. ... A lot of experience is to be gained from their experience."

Nevertheless, Winnacker foresees that an ERC will markedly transform the European university system as it will force them to compete for the best scientists.

But he also warned the gathered scientists that they should not take an ERC for granted and will therefore need many allies to make it a reality in the face of resistance from various European finance ministries. This would also involve the national research councils. "EUROHORCs tries to be a catalyst, a midwife," Winnacker explained, "without ever forgetting that the ERC must be an instrument in its own right." But the fact that Winnacker, a leading molecular biologist in Germany, will soon step down from his position as the President of EUROHORCs and will be succeeded by Nijkamp, did not necessarily reassure some attendants that his position will prevail in the association.

If the EC proposes the creation of an ERC with a substantial budget, if the European ministers of finance and research and the heads of state agree, if the European Parliament accepts the proposal, and if it is created with sufficient autonomy from the commission and national governments, then the scientists of Europe will have had their way. It would be an outstanding success for their lobbying efforts, as well as a large step towards the vision of a European Research Area (ERA), which the former Commissioner for Research, Philippe Busquin, had been advocating when he took office in 1999. However, it would be just the beginning, rather than the culmination of efforts. "The ERC is not the solution to all problems," said Reinder van Duinen, President of the European Science Foundation. "It is an absolutely necessary instrument for the ERA but it is not the only one." Winnacker also pointed out the need for more action at the European level. "The ERC can only be one of several funding instruments in the EU portfolio," he said.

"Science policy has entered a new state"

In fact, it is valid to question whether a new funding agency for basic research at the European level would be enough to solve all of the problems mentioned above. Dearing actually formulated three goals, which might go well beyond the scope of the ERC: to raise the attractiveness of science in Europe so that European scientists return from the USA;

to raise the attractiveness of Europe to draw scientists from other parts of the world; and to raise the overall level of research investment in Europe. An ERC that is just a funding mechanism might not be able to achieve this. It was Iain Mattaj, present Scientific Director and the designated Director General of the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, who asked whether an ERC should fulfil a further role: that of formulating a European research strategy?

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At present, there is clearly no such strategy. Science policy is formulated in Berlin, London, Paris, and other capitals, and to some extent at the EC, but none of these take a truly international outlook on basic research, on the career and job prospects of scientists across Europe, on the role and function of large European research infrastructure and facilities (such as EMBL, the European Laboratory for Particle Physics (CERN) and the European Space Agency), and on how to remove hurdles to the mobility of researchers. The successful creation of an ERC might prompt European scientists to push for even greater change, as they realize that they can make a difference. As José Mariano Gago, Chair of the ISE and a former minister of research and technology in Portugal, summarized, "Science policy has entered a new state," which is increasingly driven by the scientists themselves. Catherine Dargemont, President of *Sauvons La Recherche* (Let's Save Research), the organization that forced the French Government to take back its announced cuts to science and research earlier this year, reassured the audience that if there is a will, there is a way: "As scientists we should not underestimate our capacity to influence our politicians."

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doi:10.1038/sj.embor.7400306

Should auld acquaintance be forgot...

The 'hygiene hypothesis' is less about cleanliness, and more about the changes that humans have made to their lifestyle

In 1989, David Strachan from the London School of Hygiene and Tropical Medicine, UK, proposed an intriguing explanation for the sudden rise in hay fever and allergic diseases in developed countries during the previous few decades. His theory, later nicknamed the 'hygiene hypothesis', linked allergies to hygiene and household size. Based on observations that children in large families were less likely to develop hay fever than those with fewer siblings, Strachan declared that "declining family size, improved household amenities and higher standards of personal cleanliness" had all decreased the number of infections that children contracted, which might have led to more allergic diseases (Strachan, 1989). Before long, his hypothesis became synonymous with the belief that the trend towards better hygiene and cleanliness was the main cause for the relatively recent emergence of asthma, hay fever and other allergies.

... the time has come to rethink, and rename, the hygiene hypothesis

At that time, immunological research seemed to support the idea that a naive immune system—that is, one that was not permanently challenged by infectious or parasitic organisms—was likely to overreact to more benign objects in the environment. Work over the past 15 years, however, has revealed that the real picture is much more complicated. Recent research indicates that the risk of developing allergies is not necessarily caused by a lack of bugs and parasites in the environment *per se*, but rather by a lack of certain organisms that have, over the course of evolution, trained our immune system be

more tolerant. This suggests that the time has come to rethink, and rename, the hygiene hypothesis.

When researchers first tried to understand the link between infectious and allergic diseases, it seemed logical to focus on one particular component of the immune system: T-helper (Th) cells. Th1 cells normally fight bacterial or viral infections, but also have a role in autoimmune disease. By contrast, Th2 cells deal with parasitic infections and mediate allergic reactions. Allergy researchers initially believed that reduced exposure to microorganisms failed to prime the Th1 response, which then led to overcompensating Th2 activity and resulted in allergies. However, "at exactly the same time, a smaller number of people working in the field of autoimmunity, where diseases are of course mostly mediated by Th1 lymphocytes, were producing the reverse hypothesis," said Graham Rook, a professor at the Centre for Infectious Diseases and International Health at the Royal Free and University Medical School in London, UK. "They were actually saying there's not enough Th2 activity around now, we need more Th2 to down-regulate the Th1 that's causing multiple sclerosis, type 1 diabetes, and Crohn's disease." In fact, while allergy specialists had been preoccupied with explaining the sudden rise of asthma and allergic disorders, the prevalence of autoimmune diseases, such as multiple sclerosis, type 1 diabetes and inflammatory bowel disorders, had risen just as dramatically.

This, in turn, put paid to the theory that Th2 cells were directly responsible and prompted researchers to look elsewhere. "What one needs is a hypothesis that can explain a simultaneous increase in Th2-mediated diseases, Th1-mediated diseases and also inflammatory bowel disease, which is mostly Th1-mediated but possibly