

Stitching Together Cross-border Research

European research has been hampered by fragmented national research programs. Is joint programming the answer? Colin Macilwain investigates.

The nations of the European Union (EU) spent €80 billion (\$100 billion) last year on public nonmilitary research and development, yet European science still seems to have a quality gap compared with the US. For example, the EU produces 33% of research papers published annually worldwide but garners only 34% of citations, compared with the US, which publishes 29% of papers but earns 41% of citations (<http://www.nsf.gov/statistics/seind08/>). Policymakers believe that one reason for this quality shortfall is the fragmentation of research spending in Europe. According to the European Commission based in Brussels, 85% of public research funds in Europe are distributed through separate national programs run by the EU's 27 member states. Many think that the way to get more bang for their euro is to tie these national activities more closely together.

Multiple attempts to unite different European research programs have failed, however. The €7 billion that the European Commission allocates for research annually through its Framework Programme is supposed to nurture cross-border collaborations but does so one project at a time. And other efforts—including the long-established European Cooperation in Science and Technology (COST) scheme and plans in the Framework 6 Programme (which ran from 2002 to 2006) for “integrated projects” and “networks of excellence”—tried and failed to link the national research programs together. All of these efforts have foundered on a mixture of bureaucracy, nationalism, inertia, and the reluctance of top researchers, who are able to get funding in their own countries, to get involved. “It is very difficult for member states to come together on a common basis,” concedes Enda Connolly, chief executive of Ireland’s Health Research Board, which distributes €40 million annually for biomedical research in Ireland. “They are all locked into their own programs.”

In the last 2 years, however, a new fix has been proposed for the problem: “joint programming” between national research agencies. The idea is to get interested nations to band together and agree on a detailed strategy for a given research field and then pick-and-choose which elements of that strategy to collaborate on. “Joint programming is critical to the future, but it is still in gestation,” says Frank Gannon, former director of the European Molecular Biology Organization and current member of the European Research Area Board, which advises the European Commission. “From my point of view, it is currently the most crucial, single thing that we have to put right.”

Last December, the Council of Ministers representing the EU member states confirmed that the first joint programming pilot

project would focus on neurodegenerative disease research, which is particularly weak and fragmented in Europe (Figure 1). The European Commission’s research directorate estimates that US spending in this area (\$856 million, or €527 million, in 2007) is almost ten times that of Europe (\$93 million, or €57 million).

Alzheimer’s disease researcher Bart De Strooper of KU Leuven in Belgium agrees that neurodegenerative disease research is lagging in Europe. “My impression is that in the United States, much more of a vision has been developed with regard to problems of aging, and Alzheimer’s in particular,” he says, pointing to collaborations such as the Alzheimer’s Disease Neuroimaging Initiative (<http://www.loni.ucla.edu/ADNI/>), which is supported by several institutes of the National Institutes of Health (NIH)

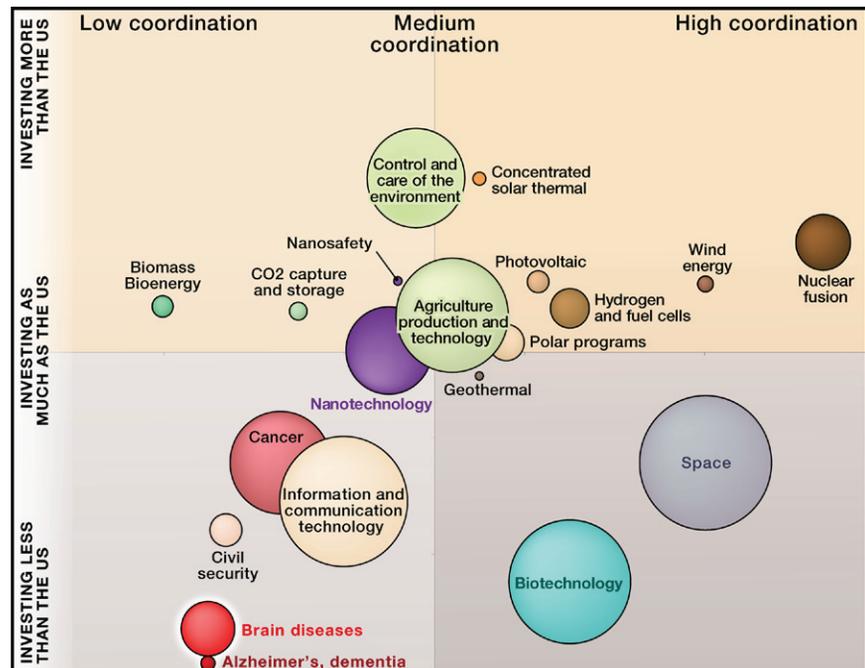


Figure 1. Europe's Research Landscape
Brain disease research in Europe including the study of neurodegenerative diseases such as Alzheimer’s and Parkinson’s is weakly coordinated across Europe and receives less investment compared with the US. (x axis, degree of coordination; y axis, spending in Europe relative to the US). Source: European Commission, 2008 (ec.europa.eu/research/press/2008/pdf/com_2008_468_en.pdf).

and the private sector. “We in Europe look to the US and are happy if some of us are incorporated in their initiatives,” he says. “We should be much more active on the international scene.”

The idea of a combined approach to boost neurodegenerative disease research was first proposed in 2008, when France held the rotating presidency of the EU and President Nicolas Sarkozy sought to push aging issues higher up Europe’s research agenda. In July of that year, the European Commission issued a paper advocating joint programming as a generic approach to improving coordination among national research bodies. Meanwhile, medical research agencies in France, Germany, and the UK were already seeking ways to strengthen their respective involvement in an area of biology where the US has a pronounced lead (<http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC004898>).

Philippe Amouyel, an epidemiologist at the University of Lille in France, led a working group established in 2008 to look into the idea of joint programming in the discipline and is now chair of the board of the EU Joint Programme for Neurodegenerative Disease. (Connolly also sits on the initiative’s five-person management board.) Initially supported by INSERM, the French biomedical research agency, the working group now has a small €2 million European Commission grant to cover its administration costs.

The Joint Programme has appointed a fifteen-member scientific advisory board, which met in Stockholm in April and will now draw up a 5 year strategic plan for neurodegenerative disease research in Europe. The board is made up of five social scientists, five clinicians, and five biologists: Jesus Avila of the University of Madrid, Bart De Strooper, John Hardy of University College, London, Leszek Kaczmarek of the Polish Academy of Sciences and the chairman, Thomas Gasser of the University of Tübingen. There is no budget yet to implement the plan, but officials involved in the discussions say that it is likely to involve an investment of about €200 million over 5 years, mainly from national funding bodies. “For the very first time,” says Amouyel, “we’ll have

a common view in Europe of what we need to do in neurodegenerative disease research.”

Most of the research supported will be in basic neurobiology, including sequencing the complete genomes of patients to find risk genes, the development and standardization of disease biomarkers, and developing better animal models of these diseases. “The big problem is that we don’t have a pipeline for new therapies, so we need to better understand the fundamental pathophysiology of these diseases,” says Rob Buckle, program manager for neurosciences and mental health at the UK Medical Research Council (MRC). “This is an opportunity to do things in a different way in Europe.” Buckle says he hopes that the Joint Programme will do work that could be relevant to the treatment of several neurological diseases, including Parkinson’s and motor neuron disease, as well as Alzheimer’s. “Mechanistically, there’s a lot of overlap between these disorders,” he says.

Gasser, a neurologist who studies Parkinson’s disease, says the scientific advisory board will confer broadly before publishing its research plan in summer 2011. Three meetings early next year, involving interested biologists, clinicians, and social scientists, respectively, will help the process along. Gasser adds that there is a “huge political will” to make the Joint Programme work but notes that its directed approach “will never displace bottom-up, undirected basic research that can give us completely new insights.”

There are already some examples of the kinds of collaboration that might proceed under the Joint Programme. On June 29th, for example, the UK MRC, the German Centre for Neurodegenerative Diseases (DZNE), and the Canadian Institutes of Health Research (CIHR) announced a £3 million (\$4.6 million) collaboration on methods, technologies, and data sharing in neurodegenerative disease research. (Canada’s involvement reflects the MRC’s desire to cooperate with partners outside Europe who have relevant expertise.) And Amouyel says that some test projects may go ahead under the Joint Programme before the strategic plan’s completion, in areas such as genomics, the standardization of bio-

markers, developing new therapeutics, and infrastructure for large clinical trials. “They could get going by the end of the year,” he says, adding that the initiative is moving quickly. “To get something from concept to practical action in three years is really new in European research policy.”

De Strooper adds that as a researcher in Belgium, he sees advantages in collaborating with larger countries—France, Germany, and the UK—that are starting initiatives in neurodegenerative disease research. He says that he hopes the Joint Programme will help researchers to do animal modeling and drug screening, obtain microRNA profiles of patients, and do deep sequencing and annotation of expression profiles for Alzheimer’s and other diseases. Alzheimer’s researcher and geneticist John Hardy says he hopes that the program can help researchers to find better biomarkers for neurodegenerative diseases and to use rapid, full-genome sequencing of patients to find the risk genes for them. But he admits that it is too early to know how it will unfold. “You get involved in the process, but you never know if there’s going to be a good outcome,” he says. “There is a genuine need for it. But you do worry that the optimism behind the programme will end up clashing with the hard reality of budget cuts.”

Although the joint programming pilot has been broadly welcomed, many experienced researchers and research administrators have questioned whether the joint programming approach has enough backing or momentum to have much impact on fragmented European research. Critics charge that the overall approach is ill-defined, inadequately promoted, and—most of all—underfinanced. Physician and European Research Advisory Board member Jerzy Langer of the Polish Academy of Sciences says he fears that it won’t get much further than a long line of prior Commission efforts to get national research agencies to work more closely. “I’m not saying it is wrong,” he says. “But any initiative that starts from the bureaucracy tends to go nowhere.” Langer contends that joint programming currently still has little constituency among researchers. “The key question,” he says, “is when, and in what capacity, real researchers get involved.”

“There is serious added value to be achieved if we can use joint programming to get national funding used more effectively,” says Ian Halliday, president of the European Science Foundation in Strasbourg. “But politically and organizationally, this is not going to be easy.” And observers of the joint programming pilot say that the MRC and INSERM are already frustrated by the need to accommodate participation by the 24 EU nations who have signed up for the pilot—many of whom cannot contribute much in the way of cutting-edge neurobiology. Some suggest that participants will have to learn to do what physicists have done at CERN, the successful European particle physics center in Switzerland, and find ways of accommodating partners who are less scientifically advanced.

Buckle denies that this is a problem for the MRC, arguing that the Joint Programme for Neurodegenerative Disease will be an “umbrella” for the sharing of information and will allow “different constellations” of nations to work together on different areas of interest. “Everyone involved will be signed up to the same top-level objectives,” he says, “but everyone will have different interpretations of how to best achieve them.”

Backers of joint programming say it can work because it is the EU member states, through the Council of Ministers, who have endorsed the approach and have pledged to see it through. “For the first time, member states are coming

together at the ministerial level to identify jointly areas where public research can contribute to tackling Europe’s major societal problems,” said Maire Geoghegan-Quinn, the newly appointed European Commissioner for research, in a statement. “It is precisely because it is underpinned by a high-level, strategic and structured process—and most importantly of all, by real political will—that joint programming is a very big step forward.”

The Commission’s approach to the idea is finely nuanced, however, because if joint programming is seen as a Commission project, member states will view it as a means of getting Commission money. So Commission officials are orchestrating it from behind the scenes, hoping that national governments will take the actions needed to provide money and drive it forward. But there are hints that large-scale Commission funding to support joint programming could become available under the next phase of the Framework Programme, FP8, which starts in 2014.

Governments are certainly watching the pilot with interest. In April, the Commission recommended three further pilots—in food security, healthy diets, and cultural heritage conservation. In tough economic times, at least in theory, joint programming could help to reduce duplication enabling research funds to be spent more efficiently. “In a way, a shrinking budget is an opportunity,” says

Amouyel, “because you have to allocate resources more efficiently.” And in fields such as neurodegenerative disease, where even the largest national research agencies cannot cover every aspect, the joint programming approach may help.

Yet the odds remain stacked against it making much difference: EU member states control five-sixths of Europe’s research budget, and they want to spend it on their own scientists. A 2009 study by Eurohorcs, the federation of national research councils, found that 14 out of 32 of the national agencies surveyed had legal prohibitions on supporting work outside their borders (<http://www.era.gv.at/attach/EUROHORCS.pdf>). At the larger agencies, around 5% of the budget is usually devoted to collaborations with European partners (some small agencies, such as the Foundation for Polish Science and the Greek National Hellenic Research Foundation, spend proportionally more). The perceived political drawbacks of spending dwindling research funds “abroad” remain daunting, however. And there is a strong imperative within national research agencies to hold on to control of what they have. “There’s always going to be people at national agencies who fear that they could lose out” from joint programming, agrees Connolly. “But there’s very strong commitment at the political level, and in the European Commission, to making this happen. Member states are coming to see that they can’t do everything on their own.”

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