NATURE|Vol 453|22 May 2008

Westernizing Eastern-bloc science

Scientists are learning how to use what the EU offers, says **Quirin Schiermeier**.

When the Czech Republic joined the European Union (EU) in 2004, its research and higher education were still in transition from its old Eastern-bloc system to a Western structure based on grants, competition and peer review. Its scientific output lagged far behind the EU average. But the picture is very different now.

"Things have improved greatly here," says Vaclav Horejsi, director of the Czech Academy of Science's Institute of Molecular Genetics in Prague. "Fifteen years ago we were really scared of losing all the best young people to the West. Now many expatriates are returning with loads of invaluable contacts and experiences that often open the doors to European networks and research collaborations."

Not only is domestic funding getting better — with the Czech Republic putting more into science than some long-time EU members (see graph) — but some teams and institutes are becoming sought-after partners in European research collaborations.

Its former Eastern-bloc neighbours, however, have had varied fortunes since joining the western European community. Slovakia, Slovenia, Estonia, Hungary, Latvia, Lithuania and Poland joined the EU in 2004, followed by Romania and Bulgaria last year.

University education and research were traditionally separate in Eastern-bloc countries, with most research carried out in institutes run by national academies of sciences. There was little or no competition for grants because academy institutes received a lump sum from the government. In most of the new EU states the academies still exist, with ageing staff and strong resistance to competition through grant-based funding.

None of the new members is yet up to standard in the number of grant proposals submitted, in industry participation (all EU consortia include partners from industry) and in the number of principal investigators in charge of EU research consortia. But some scientists are getting to grips with the new funding opportunities such as the EU's Seventh Framework Programme (FP7), running from 2007 to 2013. About 10% of successful proposals come from the new member states, according to preliminary results of the first calls for proposals.

Initial FP7 figures show that they are as successful as anyone else in the evaluation process. In fact, the overall success rate of Czech teams in the first 57 calls was above the EU average in most areas. Those from Estonia and Lithuania did similarly well. They and, according to early indications, Hungary are doing well in a number of fields, such as biotechnology.

A small but growing number of competitive teams and institutes is leading the way. In biotechnology, nanosciences, materials research and aeronautics, Czech teams have obtained about 1.5% of the €17.5-billion (US$27-billion) framework programme.

Prague's Institute of Molecular Genetics is located in one of central Europe's most modern biotech campuses. Six junior group leaders, all Czech- and Slovak-born scientists recruited from abroad, have recently taken up work at the new €35-million building with its animal house, conference hall and state-of-the-art lab equipment.

"The chance to build my own group was the main motivation for me to return," says cell biologist David Stanèk, who completed postdoctoral research at the University of Washington in Seattle and at the Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) in Dresden, Germany, before returning home in 2005. "In a small country like mine, individual scientists have more influence on the course of things than they would have in the United States or Germany."

The Prague institute is involved in numerous joint projects with partners in western Europe, including five EU-funded collaborations. Horejsi's group is preparing an FP7 grant proposal for a project in molecular immunology, coordinated by the MPI-CBG.

"The basis of our success is the young, mobile generation of scientists with networks abroad" — Mart Ustav

This large institute, only a short train-ride from Prague, has become an important training ground for young scientists from central and eastern Europe. The European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, is equally valuable. Both are focal points for successful collaborations — one of the keys to success for the new states.

"For a Max Planck researcher it is the most natural thing in the world to ring up a colleague at Imperial College London. It's just built in their psyche for years," says Brendan Hawdon, a European Commission official who oversees the coordination of FP7.

The new member-states' institutions have less of a tradition of scientific cooperation. Hawdon admits that there is snobbery, too. Researchers in rich countries are sometimes reluctant to consider lesser-known scientists from weaker countries as EU-funded partners, he says.

But as EU-funded research is primarily aimed at scientific excellence, and not at regional convergence, the commission will choose the best proposals regardless of whether they come from teams in Oxford, Prague or Sofia. "Things must happen naturally," says Hawdon. "There will be no forced marriages."

Radically modernized system

Estonia, with only about 3,000 researchers among its population of 1.3 million, is well on the way to becoming a model for the Baltic region. "We do know our weaknesses," says Mart Ustav, department chair of biomedical technology at the University of Tartu. "Public expenditure on science is still rather low, and industry doesn't add much to it."

But since Estonia gained independence from the Soviet Union in 1991, it has changed its science system more radically, and more successfully, than any other formerly communist country in Europe. The merger in 1993 of the Academy of Sciences with the country's universities in Talinn and Tartu ended the separation between research and teaching, and generated a situation in which students and young scientists can do active research in the lab early on.

In addition, the government invested to the best of its ability in new institutes and research equipment. This policy has paid off. The Institute of Technology at the University of Tartu has become a scientific powerhouse, involved in many transnational collaborations and with a strong scientific output. The country's overall return rate from FP7 is at least three times higher than its financial contribution to the programme. "We would be happy if our example stands up," says Ustav.

Part of the Estonian strategy is to offer expatriates who are willing to return the same excellent conditions they have got used to abroad — an idea that the tiny nation can more easily put into action

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than its larger neighbours such as Poland with their more cumbersome political systems.

"The basis of our success is the young, mobile generation of scientists with networks abroad," says Ustav. But once you're used to "driving a Mercedes", he says, you just don't want to steer an old clunker any more.

The challenge of competition

Although a few top institutes, from Budapest to Talinn, do now attract a number of EU grants, the large majority of researchers in the new member-states show little enthusiasm for European research, instead looking for support elsewhere. Many don't even try to get European money. They may see no need, no hope of succeeding or no way to grasp the bureaucratic system.

"Let's face it, the 'old guard' is simply not competitive enough," says Croatian-born Ivan Dikic, a biochemist at the University of Frankfurt in Germany, referring to middle-aged tenured professors. Because few labs are doing top research, and those labs don't cover all fields, it remains difficult to find scientific partners in the new member states. "There is no lack of talented students and excellent young scientists in the region, but often we just don't know who they are," he says. "They are not aggressive enough in getting out, promoting their skills, and letting us know what they're good at."

Poland, by far the largest of the new member states, isn't performing well. Its teams are underrepresented: although it has 8% of the total EU population, it takes part in only 2.3% of successful EU-funded cooperation programme proposals.

Marta Miaczynska, now a group leader at the International Institute of Molecular and Cell Biology (IIMCB) in Warsaw, completed postdoctoral research at both the MPI-CBG and EMBL before returning to her native Poland three years ago. The contacts and personal reputation she built up while working abroad helped her establish her new group as one of the 12 partners participating in an €11-million EU-funded collaboration on cellular signalling and endocytosis.

But the IIMCB, governed by an international advisory board, is an exception. The low success rates of Polish teams in the first FP7 calls — and Poland's total failure in the first round of applications for young investigator awards by the European Research Council — led the government to propose a sweeping reform of the system, with calls for more competition, more grant money, a better retirement scheme for ageing professors in permanent positions, and the abolition of *Habilitation*, the second thesis required to become a professor.

"We need brain circulation instead of brain drain," says Barbara Kudrycka, the Polish minister of science and higher education (see page 438). Fresh money and more domestic competition for grants would help, says Miaczynska. But scientists must seek EU funding more aggressively as well. "People here are still learning that you need to fight very proactively for grants, particularly if you're lesser known and lack good contacts in the West," she says. "The EU bureaucracy can be scary. But often people are just not motivated enough, thinking it's too much work and too competitive anyway."

Experts think it may take 10 years or so before the new members will be on an equal footing, scientifically, with most western European countries — assuming sound investment and forward-looking policies. ■

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SOURCE: DG RESEARCH; DATA: EUROSTAT/OECD