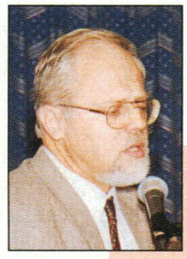
FORMER SOVIET BLOC

Hughes Grants Brighten Outlook for Elite Researchers

PRAGUE—Twelve months ago, molecular geneticist Jitka Forstová of Charles University in Prague was ready to call it quits. After a successful research career in an institute of the Czechoslovak Academy of Sciences and three years of productive research in London, she was tempted by a post at Charles University, which was eager to set up a modern molecular biology program. Forstová was stymied, however, by the primitive conditions at this historic university and the high cost of rebuilding and refurbishing laboratories. "It was very depressing and I wanted to leave," she says. But then she won one of 90 Howard Hughes Medical Institute (HHMI) scholarships for researchers in Eastern Europe and the former Soviet Union, and her scientific prospects brightened dramatically: Suddenly she had enough funds to kick-start her new research career.

The HHMI is the latest in a line of western organizations sympathetic to the plight of researchers in the former Soviet bloc, who have faced huge upheaval since the collapse of communism. For example, the International Science Foundation (ISF), founded in 1992 by George Soros, the Hungarian-American financier, has distributed around $100 million to scientists in the former Soviet Union. The European Union, the U.S. National Science Foundation, and smaller agencies such as the Russian Program of Cancer Research in New York have all pitched in with funds and collaborations. And so last summer the HHMI, which runs successful overseas programs in Mexico, Canada, and Western Europe, announced the winners in a new program that throws a lifeline to researchers in Eastern Europe. "It's survival money for some of them," HHMI president Purnell Choppin told *Science*.



The $15 million scheme, which provides annual grants of between $25,000 and $35,000 over 5 years to scholars in the former Soviet Union and its erstwhile allies, looks small by Western standards. But with government funds drying up in many countries and scientists' salaries often less than those of manual workers, it is having a significant impact.

"Suddenly you find you can get students and post-graduates."

–Jitka Forstová

Unlike ISF, which has distributed many small grants to scientists, HHMI decided to provide more generous support—but to a small, elite group. "We selected the scholars from 2,000 applicants because we are aiming to support the best. There's no apology for that," says Choppin. This summer, one year on, 87 of the grantees came to Prague at the invitation of HHMI for a conference on their work. The event provided a look at the program's success so far—along with a unique snapshot of how science is faring in the region half a dozen years after the end of communism.

"I'm sure the prestige of the grant helped us."

–Michal Novák

Although many of the changes since the fall of the Soviet Union have been welcome, such as a reduction in bureaucracy, funds for science have dwindled. In the Czech Republic alone an overhaul of the Academy of Sciences has cut the number of scientists employed in its institutes from around 14,000 in 1989 to 6,500. The country, one of the most prosperous in Eastern Europe, last year devoted only 1.06% of its gross national product to scientific activities, compared with 2.74% in the United States and 3.05% in Japan. In Hungary, the National Science Foundation budget has fallen by 30%, from $18 million in 1993 to $13 million last year. "Between 1990 and 1993, 50% of researchers applying for state funds received some support, but now only 20% do," says biochemist András Lipták of the University of Kossuth in Hungary.

In Russia, financial chaos has exacerbated the budget cuts. "Even if you get a grant, you cannot be sure the whole sum will reach the lab. Because of the constant budget deficit in some agencies they are only able to pay around 50%," says Sergei Nedospasov, a senior researcher at the V. A. Engelhardt Institute of Molecular Biology in Moscow. Pavel Balaban, a physiologist at the Institute of Higher Nervous Activity and Neurophysiology in Moscow, says his greatest fear is of being left without electricity, water, or heat. "The institute's debts are $300,000 and increasing each month," he says. And Ukrainian immunologist Svetlana Sidorenko, who has spent the past 5 years as a fellow of the American Cancer Society working at the University of Washington in Seattle, says conditions for research in Ukraine are dramatically worse than before she left.

PHOTOS BY STANISLAV TÖMA

In some parts of the former Soviet bloc, however, there are signs of an upturn. The small Baltic state of Estonia, which became independent of Russia in 1991, overhauled its higher education system to a more Western style, with a 4-year bachelor's degree and 4-year Ph.D., and committed 1.5% of its annual budget to science. "It has kept its promise," says Madis Metsis, a senior researcher at the Institute of Chemical Physics and Biophysics in Tallinn. "Some Estonian scientists abroad are beginning to return. I think there will eventually be a brain drain back into Estonia," he says.

And even in Russia, there is an upside to the changes: Taking advantage of low wage costs, local manufacturing companies have sprung up to produce research materials much more cheaply than foreign imports. Evgeny Rogeav, a molecular biologist at the Research Center of Mental Health in Moscow, has just bought his first Russian-made automated polymerase chain reaction (PCR) machine, which he uses to copy samples of DNA. "It's good, reliable and a lot cheaper than an imported foreign machine," he says.

Still, what Nedospasov calls "the predictability and stability" of the 5-year HHMI grants is a boon, say recipients. For some of the scholars, the HHMI grant provides up to 90% of their funds. Sixty of the grants include funds to maintain collaborations with Western scientists. "We thought very hard about how a little money could have a big

HHMI EAST EUROPE GRANTS

Country	No. of grants	Total funds ($m)
Russia	36	5.3
Hungary	14	2.2
Czech Republic	12	1.6
Poland	12	1.6
Slovak Republic	6	0.7
Ukraine	3	0.5
Lithuania	3	0.4
Estonia	2	0.3
Belarus	1	0.1
Latvia	1	0.1

impact," says Choppin. "We're pleased with how the program is looking so far."

The grants are large enough to supplement researchers' meager incomes—something researchers say is crucial to stemming the brain drain. In the Czech Republic the salary for a post-graduate fellow is around $115 per month, but a secretary in a company could earn three times that, says Forstová. Similarly, in Poland a full professor earns three to four times less than a manager in a private company, says biochemist Stanislaw Zolnierowicz of the University of Gdansk. "Bright students either turn to other jobs or seek research jobs abroad," says Forstová. Most HHMI grantees are also using the money to add to their team's salaries. "A senior researcher earns $200 per month, but I can add $250 to $500 to this for 2–3 people," says Nedospasov. "Suddenly you find you can get students and post-graduates," says Forstová.

The grants have also paid off for collaborators in the West. Theoretical biologist John Tyson at Virginia State University, who works with HHMI grantee Béla Novák at the Technical University of Budapest, says that the award frees his collaborators up from the search for many small grants. The grant "means we can explore our theoretical work in many more biological systems than previously would have been possible," he says.

A key worry for HHMI planners was that providing grantees with relatively large sums of money would backfire and cash-strapped national agencies would then cut back on other support. When the Polish government rejected a grant application from Zolnierowicz, he was told that the Hughes grant was the reason. HHMI's Choppin says little can be done about the problem, but he believes it is not widespread.

Indeed, HHMI grants can sometimes have the opposite effect: shaking loose government funds by providing an endorsement of the recipient. Molecular biologist Michal Novák of the Slovak Academy of Sciences in Bratislava had solicited government funds to help establish a new Institute of Neuroimmunology at the Academy and won support after getting the HHMI grant. "I'm sure the prestige of the grant helped us," he says. And Forstová, who applied to the Czech government's competitive scheme for funds to boost research infrastructure in universities after winning her HHMI grant, was successful against stiff, nationwide competition, she says.

From the gloom of a year ago, Forstová—like the small company of other Hughes grantees—is now looking forward. "I'm keen to get on with research and make something from these awards," she says.

–Nigel Williams

INTERNATIONAL COLLABORATION

European Labs Brace for German Cuts

Scientists at five of Europe's major international research centers have reacted with dismay to news that Germany intends to make deep cuts in its contributions to their budgets next year. The costs of running these labs—which include the CERN particle physics center near Geneva, the European Synchrotron Radiation Facility (ESRF) at Grenoble, and Heidelberg's European Molecular Biology Laboratory (EMBL)—are generally divided up among member countries according to their gross national product. That makes Germany, as Europe's wealthiest nation, the biggest contributor to these organizations, and the cuts—part of an austere federal budget, some details of which were announced last month (*Science*, 19 July, p. 306)—will consequently be very damaging if they go ahead. "It's a huge cut," says Christof Kunz, a research director at the 12-member ESRF, which is slated for an 8.6% cut from Germany, which currently provides about a quarter of its funds.

Full details of the budget have yet to be officially announced, but in the outline released last month, the ministry of research, technology, and education was dealt a 2.5% overall cut. Most domestic R&D programs—with the notable exceptions of the Max Planck and Fraunhofer Institutes—would be trimmed, but the international labs would be hit much harder: It appears that Germany's contributions would be slashed on average by about 8%. And the cuts would come at a particularly bad time for many of the facilities. CERN is gearing up for the construction of its next big accelerator, the Large Hadron Collider (LHC), and is trying to persuade the likes of Japan and the United States to contribute; ESRF still has nine of its total of 30 beamlines under construction; the European Southern Observatory is in the middle of building its Very Large Telescope (VLT) array in Chile; and the Institut Laue-Langevin (ILL) in Grenoble, a research reactor for neutron scattering studies, is already working below full capacity, following cuts by the United Kingdom in 1991. "It would be quite dramatic after the earlier cut. It could be extremely severe," says Reinhard Scherm, director of ILL, which is facing a 7.2% cut.

The reductions in Germany's contributions would be painful enough on their own, but what really has lab directors worried is the possibility that other member countries might follow suit. Contributions to these laboratories are governed by international treaties and so any budget cuts would have to be negotiated with all members of each facility. "One [CERN] member state cannot simply reduce its contribution at will," explains CERN spokesperson Neil Calder. Countries such as the United Kingdom and Italy are also keen to reduce their commitments to international labs, and "If the Germans propose anything like this, the British are going to follow," predicts CERN physicist Maurice Jacob.

Until the formal announcement of the budget, CERN is making no official comment on its possible 9.3% cut. If such a cut really were to be implemented it "would be very difficult" to sustain, says Jacob. But CERN staff are already voicing concern that potential participants in the LHC project from outside Europe will be scared off. "It is absolutely clear ... that this would send the wrong signal," says director of accelerators Kurt Hübner.

CERN's 19 member states approved the construction of the LHC in December 1994, with the proviso that the contributions of member states would not be increased to pay for it and its construction would not rely on nonmember contributions. This meant that the 14 tera-electron volt accelerator, which will be the world's most powerful, would not be completed before 2008. However, if nonmembers did contribute, the schedule could be speeded up; if enough money was raised outside Europe, the LHC could be completed by 2005, and that decision will be made next year. Japan is expected to contribute 60 million Swiss Francs ($50 million) and Russia a further 134 million SFr ($112 million), with the United States expected to chip in $530 million subject to Congressional approval. But such promises may evaporate if cost cutting delays the project. "If the machine is too much delayed, the non-

GERMANY'S SPENDING ON INTERNATIONAL LABS
(millions of Deutschemarks)

	1996 Budget	1997 Proposed	Reduction
European Laboratory for Particle Physics (CERN)	265.7	240.9	–9.3%
European Molecular Biology Laboratory (EMBL)	22.15	21.2	–4.3%
European Southern Observatory (ESO)	38.6	37.5	–2.9%
European Synchrotron Radiation Facility (ESRF)	30.3	27.7	–8.6%
Institut Laue-Langevin (ILL)	32.9	30.5	–7.2%
Total	**389.7**	**357.8**	**–8.2%**

SOURCE: MINISTRY OF RESEARCH, TECHNOLOGY, AND EDUCATION