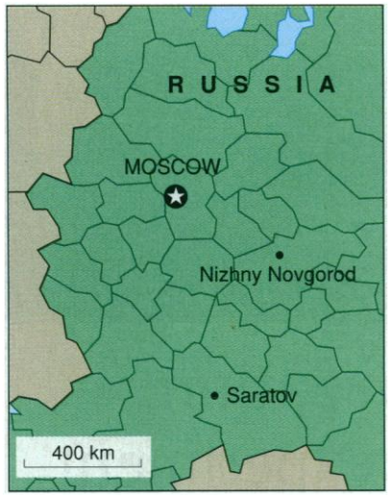
RUSSIAN SCIENCE

Program Luring Foreign Talent Gets a Boost

NIZHNY NOVGOROD, RUSSIA—For half a century this city was shrouded in mystery, closed to foreigners for much of the Cold War. But in a sign of how life has changed since the Soviet Union broke up, Nizhny Novgorod is now spearheading an effort to lure foreign scientists to Russia for short stints of teaching or research. The idea is that distinguished colleagues from abroad will fire up students—and, perhaps, preserve high-level science in the fraying former superpower. The program "helps students feel they aren't doing provincial science," says Alexander Litvak, dean of the University of Nizhny Novgorod's (UNN's) Advanced School for General and Applied Physics.



Centers of gravity. INCAS pulls in top guns.

In a tribute to how highly regarded the 4-year-old program—called the International Center for Advanced Studies (INCAS)—has become, it is now being replicated in two other regions. Earlier this month, the Open Society Institute (OSI), a foundation set up by financier George Soros to support reform in Eastern Europe, approved plans to fund INCAS centers in Saratov and Moscow, in partnership with local authorities. "INCAS is one of the little success stories that flies in the face of conventional wisdom that all is terrible in Russia now," says Neal Abraham, vice president for academic affairs at DePauw University in Greencastle, Indiana.

The idea for INCAS was born in late 1994, when Mikhail Rabinovich, a physicist at the Institute of Applied Physics (IAS) in Nizhny Novgorod and the University of California, San Diego, concluded that budding Russian researchers needed exposure to "aggressive, active scientists." Rabinovich first successfully pitched the idea to his former student, Boris Nemtsov, then the governor of Nizhny Novgorod region. Next he wooed Valery Soyfer, director of a Soros program that gives stipends to Russian educators and students. Soyfer praised INCAS to Soros, who told OSI to take a look. INCAS's merits and its shoestring budget—about $100,000 a year—convinced OSI to share costs with the regional government, now headed by Ivan Sklyarov, and Russia's science ministry.

Since then Rabinovich, IAS Director Andrei Gaponov-Grekhov, and dedicated volunteers have run annual grant competitions open to all institutes and universities in Nizhny Novgorod region. INCAS so far has awarded some 60 grants for local labs to host foreign scientists, who do everything from studying the optical properties of fullerenes to giving lectures on herbivorous insects. The typical research grant averages $4500, lasts less than 6 months, and pays expenses of visiting scientists, as well as stipends for a few young Russian students and researchers.

Foreign researchers say the visits produce results. Patrick Weidman, a physicist at the University of Colorado, Boulder, says his 3-month stint in 1996 for research on soap films yielded two peer-reviewed papers. But he also found that experimenting in Nizhny Novgorod can be a challenge: Supplies are scarce, and he had a hard time making devices. "The machine shop had no schedule," he says. "It just depended on whether the poorly paid machinists wanted to show up for work or not." Nevertheless, Weidman gives the program high marks and plans to return next summer.

Some visits have forged lasting ties. For instance, Princeton University and UNN have set up a joint graduate program in plasma physics. That way Princeton "won't just take away the best and brightest young people, but will use those young people as bridges" for future collaborations, says Princeton's Nathaniel Fisch. INCAS has also set up exchanges with the Catalan Society of Chemistry in Spain and the University of Bremen in Germany.

Building on its success, the program last year began seeking partners in other regions. It selected Saratov and Moscow, which along with Nizhny Novgorod will receive INCAS support for 2 years. INCAS-S, as it's called, will be run out of Saratov State University and be slanted toward the region's world-class research on nonlinear dynamics. INCAS-M will be headquartered at the Kurchatov Institute, the well-known nuclear physics center. These two regions beat out others interested in hosting INCAS centers because they anted up matching funds. Establishing a center in Moscow seemed to run counter to INCAS's philosophy of supporting science in the struggling provinces, but Kurchatov director Evgeny Velikhov persuaded his friend Rabinovich that Moscow was having as hard a time as anywhere else. "Usually we are trying to find partners in the provinces," admits Vyacheslav Bakhmin, director of OSI-Russia's culture division. "But sometimes exceptions take place."

INCAS officials say it's too soon to tell whether the program is convincing young scientists to make a go of it in Russia. But their effort is being applauded. "Without input and close interactions involving scientists from other countries, the once-powerful scientific activities within Russia may come to ruin," says John Eaton of Baylor College of Medicine in Houston. "It is precisely programs such as those at INCAS which hold promise for reversing the downward spiral in the quality and quantity of Russian science."

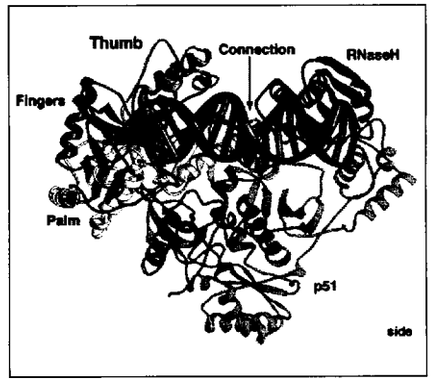
—RICHARD STONE

AIDS RESEARCH

Outsmarting HIV Drug Resistance

For many HIV-infected people, a cocktail of antiviral drugs is all that stands between them and the immune system collapse that characterizes full-blown AIDS. And sooner or later, this defense falters. Many of the drugs act by interfering with a key HIV enzyme called reverse transcriptase (RT), and eventually the replicating virus mutates into strains whose RT is resistant to the drugs, forcing patients to move on to new drugs or drug combinations. Now a team from Harvard University has obtained an atomic portrait of the enzyme that should give new clues to how the virus foils existing drugs, along with targets for new drugs that might be harder to thwart.

On page 1669, chemical biologists Gregory Verdine and Huifang Huang and structural biologists Stephen Harrison and Rajiv Chopra present the x-ray crystal structure of RT in a complex with the molecules with which it normally interacts in the HIV life cycle. They include one that binds to the same site as many of the existing anti-HIV drugs that work by inhibiting RT, including AZT and 3TC. As a result, says virologist Douglas Richman of the University of California, San



Pièce de résistance. Crystal structure of key HIV enzyme with its substrates.

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