ITALY

Returning Émigrés Add New Luster to AIDS Research

MILAN—In late 1993, after spending 7 years at the U.S. National Institutes of Health (NIH) in Anthony Fauci's laboratory, AIDS researcher Guido Poli and his wife, Italian virologist Elisa Vicenzi—who had also spent several years working on AIDS at the NIH, in Malcolm Martin's lab—decided it was time to return to their native Italy. They packed up their belongings and shipped their two cars to Milan. But the couple's move was much more than just a whim: A state-of-the-art AIDS research facility that Poli had helped to design was under construction at Milan's sprawling San Raffaele biomedical complex, and the pair had been offered positions at the new center.

Nor is the couple alone among Italian AIDS researchers in returning to their roots. The new facilities they are now working in are housed in San Raffaele's Department of Biological and Technological Research (DIBIT), a stand-alone institute that is proving to be a magnet for émigré Italian scientists in AIDS and many other areas of biology (see box).

Setting up shop as chief of DIBIT's AIDS Immunopathogenesis Unit, Poli will be joined in leading the AIDS team by Paolo Lusso, who returned to Italy 6 months ago after spending 8 years in Robert Gallo's lab at NIH. Lusso is head of the Human Virology Unit, which will also include Mauro Malnati, formerly of Eric Long's laboratory at NIH. Alberto Beretta—head of the new Immunobiology of HIV Unit and the only one of the three team leaders who did not train in the United States—says he welcomes the shot in the arm that scientists returning from high-powered American labs will give to Italian AIDS research. "The NIH is a real incubator of Italian scientists," Beretta says.

Almost all of DIBIT's returning AIDS researchers did their postdoctoral studies in the United States as part of NIH's John E. Fogarty scientist exchange program. And many worked with Gallo and Fauci. Fauci, for example, counts at least 11 Italian postdocs who have passed through his lab over the past several years. But both Gallo and Fauci—each of whose grandparents were born in Italy—say that they did not deliberately set out to turn their laboratories into training centers for Italian scientists. As Fauci puts it, "It wasn't anything I specifically did. It just kind of evolved."

The return en masse of these highly trained researchers could make Italy a force to be reckoned with in AIDS research. The San Raffaele AIDS labs, officially inaugurated in late May to the accompaniment of marching bands and speeches by Italian government dignitaries, will join a number of research groups in Rome, Bologna, Padua, Ancona, and other cities, which have already made their mark on the international AIDS research scene. Stimulated by the fact that Italy has the third highest AIDS toll in Europe after France and Spain, AIDS research has become an oasis of relatively generous support in the desert of Italy's chronically underfunded biomedical research effort. "For pure AIDS research, Italy easily matches the best of continental Europe and is far better than Germany," says Gallo, who was on hand for DIBIT's opening ceremonies.

But the fact that the returning AIDS researchers have gained such celebrity demonstrates how unusual it is for Italian science to exert such pulling power. Until recently, says Lusso, the Italian-American exchange had usually been "a single-direction enzymatic reaction," in which Italian scientists left for the United States or other countries and did not come back. One important reason Italian scientists stay abroad, says Paola Verani, director of Italy's National AIDS Project, is the severe scarcity of new research jobs, even in favored fields like AIDS. "Biomedical research is done mostly in the universities," says Verani, where young scientists must compete for a handful of positions in grueling and sometimes even corrupt competitions (*Science*, 11 November 1994, p. 965).

In contrast, DIBIT—where both the facilities and the salaries are paid for by a private religious charity—has been able to create almost a dozen new positions during the past 3 years for researchers working full-time on AIDS. "We have had the opportunity to hire people, and this is something that never happens in Italy," says Antonio Siccardi, who serves as DIBIT's overall coordinator for AIDS research. With their jobs relatively secure, DIBIT's scientists can turn their energies to competing for their share of the roughly $17 million in grants the National AIDS Project makes available each year.

Yet despite the tempting opportunities DIBIT offers in their native country, for many Italian scientists the decision to return was not an easy one—especially for those whose careers might have advanced just as quickly, if not more so, had they stayed put. Lusso notes that Gallo had asked him to remain in the United States and apply for a

Paolo Lusso

Age: 38

Current position: Chief, Human Virology Unit, DIBIT

Previous employment: National Cancer Institute, Bethesda, MD

Research: In collaboration with Robert Gallo at NIH, Lusso has studied the role that human herpesvirus 6 (HHV-6) may play as a cofactor in AIDS. Current studies include monitoring of macaques doubly infected with HHV-6 and HIV as an animal model for studying this interaction. Lusso is also working with the recently discovered HHV-7 virus. He and Gallo found that, like HIV, HHV-7 uses the CD4 molecule on T cells as its receptor. Because HHV-7 infection appears to inhibit infection of these cells with HIV, a better understanding of this virus could lead to new therapeutic strategies.

Guido Poli

Age: 37

Current position: Chief, AIDS Immunopathogenesis Unit, DIBIT

Previous employment: National Institute of Allergy and Infectious Diseases, Bethesda, MD

Research: Poli is continuing the work he began in Anthony Fauci's lab at NIH on the role that cytokines, proteins that serve as messengers between cells of the immune system, may play in AIDS. His goal is to find a way of blocking the effects of tumor necrosis factor–α, a cytokine that activates the immune system and stimulates HIV to replicate. Poli's unit is also studying the viral and cellular mechanisms controlling HIV replication, using mutated clones of HIV to study the effects of genetic changes on the virus's ability to reproduce.

Private Institute Sparks "The Return of the Brains"

MILAN—"There is never a moment when we [Italians] say, 'oh, we are doing very well,' " says Paolo Lusso, head of the Human Virology Unit at the San Raffaele Scientific Institute's Department of Biological and Technological Research (DIBIT). For much of Italian science, that bleak view may be justified, and Italian researchers speak candidly about their country's record of underachievement in science (*Science*, 24 April 1992, p. 477). But DIBIT, a stand-alone research center that opened its doors in October 1992, gives the lie to the pessimism. In less than 3 years, DIBIT has achieved an international reputation in cell and molecular biology, immunology, and neuroscience, in part by recruiting already well-known scientists from all over Italy. And it's attracting a return of émigré talent in AIDS and other fields that the Italian press has dubbed "the return of the brains" (see main text). "They achieved what seems a miracle to build this institute," says Edoardo Boncinelli, an expert in the molecular biology of development who moved his laboratory to DIBIT after 23 years at the International Institute of Genetics and Biophysics in Naples.

DIBIT

Open doors. DIBIT offers job security and a chance to work independently, luring Italian researchers back from exile.

DIBIT was the brainchild of University of Milan professors Jacopo Meldolesi and Antonio Siccardi, who wanted to create a research institute where people are recruited on the basis of merit—an exception to the way things are done in much of the Italian scientific establishment. But to achieve their ambition, Meldolesi and Siccardi needed to go outside government circles for funding. And this is where the miracle might have come in: The entire construction cost was provided by the Monte Tabor Foundation—a religious charity founded by an independent-minded Catholic priest named Luigi Maria Verzé—which also built the sprawling San Raffaele hospital and research complex in Milan's eastern suburbs. The Monte Tabor Foundation also pays the salaries of most of DIBIT's approximately 80 scientists.

The result—one of the few independent institutes in Italy—represents an escape route for researchers from the business-as-usual lethargy of Italian science. "There are very few chances to work in Italy," says Meldolesi, now DIBIT's scientific director. As a result, Meldolesi says, "there is no circulation. You tend to be born in a place and die in that place." And even those scientists lucky enough to have positions have a hard time getting hold of sufficient funds to do research. "The power is still in the hands of the old dinosaurs—they control the money," says AIDS researcher Mario Clerici of the University of Milan, who sometimes collaborates with colleagues at DIBIT.

As a result, many promising Italian scientists leave and don't return—at least for a long time. But DIBIT has been able to provide job security as well as the chance to work independently, which is far from the norm in some more traditional Italian research institutions. Says Meldolesi: "People ask, 'Don't you tell them what they should do?' No, we don't tell them what they should do."

Such working conditions have proved a magnet for scientists used to working abroad. According to Siccardi, all of the institute's unit chiefs and the majority of its scientific staff have spent much of their careers in other countries, often the United States. An example is immunologist Donata Vercelli, who spent 8 years at Harvard University before returning last year to head up DIBIT's molecular immunoregulation unit. "DIBIT has been a haven for people like me who want to come back," she says.

And this swift influx of talent has already left its mark. "It's not often you get something of that size and vitality going," says immunologist Michael Neuberger of the Medical Research Council's Laboratory of Molecular Biology in Cambridge, U.K., who sits on DIBIT's international advisory board. "It's one of those places you visit and you come away feeling very keyed up."

–M.B.

permanent position at NIH. "It was hard to say no," he says. "It was a long and painful decision." And Fauci says that he often discussed similar options with Poli. "Guido would have had no trouble getting a good job in the U.S.," says Fauci.

But returning to Italy does not necessarily mean giving up American connections. Poli will continue to work on the role that cytokines (proteins and peptides that serve as messengers between cells of the immune system) may play in the development of AIDS (*Science*, 14 April, p. 205). That research took up most of his years in Fauci's lab and will keep him in close contact with his old colleagues.

And Lusso plans to continue a close collaboration with Gallo in several areas, including their ongoing work indicating that human herpesvirus 6—a virus, discovered in Gallo's lab, that infects the same CD4 T lymphocytes targeted by HIV—may be a cofactor in AIDS. To cement the partnership, Gallo told *Science*, his new Institute of Human Virology in downtown Baltimore (*Science*, 26 May, p. 1119) will enter into a reciprocal agreement with the DIBIT labs to exchange lab space and personnel.

But perhaps most important for young Italian scientists like Poli and Lusso, the opening of the Milan AIDS labs gave them a long awaited opportunity to end their exile abroad. "I never really gave up the idea of coming back," says Lusso. "When this opportunity first came up, it was sort of a dream. Then it became real."

–Michael Balter

Alberto Beretta

Age: 41

Current position: Chief, Immunobiology of HIV Unit, DIBIT

Previous employment: University of Milan

Research: For the past several years, Beretta has studied the molecular mimicry between the gp120 envelope protein of HIV and certain human class I major histocompatibility complex (MHC) proteins. MHC proteins aid certain T lymphocytes in recognizing foreign antigens. The similarity could help to explain some of the autoimmune features of HIV infection. Other researchers in Beretta's unit are studying how differences in the highly variable V3 region of gp120 might affect the transmission of the disease, particularly from mother to child.