

EUROPE

Molecular Biology With a Strong Southern Accent

Five years ago, the Institute of Molecular Biology and Biotechnology (IMBB) seemed poised to enter the elite ranks of the world's top biology centers. Housed in spanking new buildings on the sun-drenched Greek island of Crete, IMBB was headed by an internationally known developmental geneticist, Fotis Kafatos, and had temporarily reversed the brain drain by luring some of Greece's best emigré biologists back from the United States (*Science*, 27 January 1989, p. 470). But in the past few years, IMBB has been struggling to maintain its early momentum. The Greek government, which was hoping for a quicker economic return on its investment in science, has slashed support for the center by 40% since 1989. "We're adjusting to a leaner way of operating," says IMBB's new director, molecular geneticist George Thireos.

IMBB is not alone. Establishing a top-class modern biology laboratory in southern Europe has never been easy. Portuguese biologists, like their Greek colleagues, have struggled to win funding from politicians who until recently saw research as an unnecessary luxury. Much of Spain's best young biological talent is in exile: A sharp economic downturn torpedoed plans to construct new labs to accommodate the hundreds of postdocs sent abroad for training in the late 1980s (*Science*, 18 December 1992, p. 1876). And throughout the region, stifling bureau-

cracy can paralyze even the most dynamic labs—a problem that has been compounded in Italy by endemic political corruption.

But in spite of all these difficulties, biologists in southern Europe are looking to the future with a new sense of optimism. "[T]here is the potential for a Renaissance," says Portuguese cell biologist Alexander Quintanilla, who in 1990 returned from the University of California, Berkeley, to head the new Institute for Molecular and Cell Biology in Oporto. The reason: The European Union (EU)—the post-Maastricht name for the European Community—is expected to step up the amount of money it pumps into science in the poorer regions of Europe over the next 5 years. Already, the EU's "structural funds"—a package of programs originally established to improve roads, telecommunications, and other elements of industrial infrastructure—are providing tens of millions of dollars a year for new labs, research equipment, and even Ph.D. and postdoc programs (see box, below). And now, the continent's lead-



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Slow start. Spain's National Center for Biotechnology, conceived in the mid-1980s, is only now getting up to speed.

ing multinational biology collaboration—the Heidelberg-based European Molecular Biology Laboratory (EMBL)—is hoping to add its support to the cause. Kafatos, who is now EMBL's director-general, has proposed setting up a network of EMBL-affiliated research groups at biology centers across the continent, particularly in the

Paving the Road to Successful Science

How can a program designed to provide Europe's underdeveloped regions with modern highways and telecommunications turn into one of the main sources of funds for southern European science? In Brussels-speak, the answer lies in the European Union's (EU) stated duty to promote economic "cohesion" among its 12 member states. This obscure-sounding goal gives EU officials a mandate to launch programs that will spur economic development in the union's poorest regions.

For years, this aid concentrated almost exclusively on traditional economic infrastructure. But during the 1980s, EU officials started encouraging investment in research facilities and training, to underpin high-tech industry. And when the EU's aid programs in 1989 were consolidated into a single package, dubbed the "structural funds," they contained significant earmarks for lab construction, equipment, and training. "We can pay for a scientist's chair, the bench, and the equipment on it. We just can't pay for the research work itself," says Hugh Logue, who heads the EU office that oversees the structural funds' scientific component.

For researchers in eligible regions—all of Portugal, Greece, and Ireland, southern Italy, much of Spain, former East Germany,

and other economically-depressed pockets in the EU's richer countries—this largess means that the structural funds are a bigger source of revenue than the EU's research budget. Indeed, since 1989, the four southern European EU members have received nearly \$900 million from the structural funds for science-related projects at today's exchange rates. And in 1991, the EU—worried that it was paying for science parks that were "all park and no science," as one official puts it—launched a new aid program called STRIDE, focused on equipment and training, that has brought the four countries a further \$350 million.

EU officials argue that this is money well spent, pointing to the recent scientific strides made in countries like Portugal (see main story). Indeed, they would like southern Europe's aid recipient countries to spend more of this money on science. Over the past 5 years, Greece, Portugal, and Spain each used less than 2.5% of their total structural funds aid on research-related projects, compared with Ireland's 5.5%. The problem, however, is that "politically, an extra kilometer of motorway or street lighting has more short-term appeal," says Logue.

—P.A.

south (*Science*, 17 December 1993, p. 1807).

At this point, however, the southern renaissance is still fragile, and the next few months will be a make-or-break time for the aspirations of many southern European biologists. The EMBL regional groups program has been left hanging by a thread following Italy's shock decision last December to withdraw from the lab. If this decision cannot be reversed, the program will have to be redirected and it may be badly delayed. Moreover, while the new EU structural funds agreements for 1994-99, now being hammered out in Brussels, could double allocations for science, governments in the region may channel the funds into areas of research likely to have a quicker industrial payoff than fundamental biology.

Structural change. A little money can make a big difference. Take Portugal's recent efforts. Between 1989 and 1993, Portugal's National Board for Scientific Research (JNICT) channeled around \$20 million from the structural funds into molecular biology. According to immunologist Maria De Sousa of the Institute for Biomedical Research in Oporto, this money, coupled with a 2.5-fold increase in allocations to JNICT from the Portuguese government, has spurred the growth of around a dozen internationally competitive groups. Before this expansion, Portugal had only one or two groups of this caliber. "Five years ago you could hardly find anyone in the country who would be interested in discussing any scientific matter with you," says emigré Portuguese immunologist António Coutinho of the Pasteur Institute in Paris. "Now, that's not so."

Despite such successes, the richer nations who foot the bill for the EU's scientific aid often complain about waste. The problem, they say, is that member states can freely choose which projects to support, and often fail to pick those that are soundly based. Italy provides some of the worst examples, such as the decision to build a multi-million-dollar meteorology and marine biology center in Sardinia, despite a total absence of interest in the idea among researchers in those fields (see box, p. 914). And even Portugal's efforts have at times suffered from stultifying bureaucracy. The showpiece Institute of Chemical and Biological Technology (ITQB), for instance, has had to delay moving into a new EU-funded building in Oeiras, near Lisbon, for a year because inflexible finance officials refused to release funds to install lab benches. The contract with a Portuguese/German consortium, they ruled, should have described the work as "supply of furniture," rather than "construction."

Rules laid down by the EU don't help, add many southern Europeans. Structural biologist António Xavier, ITQB's director, says that a requirement that local authorities

match the EU's structural funds aid dollar for dollar has drained national budgets, leaving little for lab running costs—which, in any case, are higher in Portugal than in northern Europe. "All the chemicals are imported, so straight away, things are more expensive," says Xavier. Equipment can lie idle through sheer lack of cash for maintenance, he adds.

This problem should soon ease, as national governments will in future have to pay only 25% of the total costs of structural funds projects, rather than the old 50:50 split. And to address the accusations of waste, EU officials are trying to get aid recipients to adopt better procedures to select and administer projects—including the review of proposals by international experts.

Whether that translates into a boon for basic biology depends on the priorities adopted by individual national authorities. The Portuguese government has already stated its intention to spend 40% of its future EU scientific aid on training, including graduate and postdoc programs, which will continue the push in basic science. But the auguries aren't uniformly good. Greece, for instance, plans to spend much of its new EU science aid on encouraging links between research centers and industry. "It makes sense," concedes IMBB's Thireos, given that the structural funds are supposed to stimulate economic development. But it's bad news for IMBB, he says, because Greece's feeble drug industry offers scant potential for collaboration.

International connections. It will take more than money to heave southern Europe's biology labs into the top rank, however. Ask researchers what else is urgently needed to stimulate scientific development in the south of Europe, and they usually answer with one word: Internationalization. This can be an elusive goal. Take the Spanish National Center for Biotechnology (CNB) in Madrid, conceived in the mid-1980s as a world-class center that would lure top foreign biologists into Spain. It got off to a good start, snaring British immunologist Michael Parkhouse in 1987 as its founding director. But by 1990, the finance ministry still had not approved an acceptable permanent contract for Parkhouse, and he stepped down. CNB, now headed by molecular virologist Mariano Esteban, a Spaniard lured back from the State University of New York, is only now getting up to speed.

Similar problems exist at the bench level. European-wide fellowship schemes, such as those run within the EU's research programs,

send large numbers of southern European postdocs abroad. But few northern Europeans move in the opposite direction, and many young southern Europeans never return home. "What we most need is young blood coming in," says Oporto's De Sousa.

That's why the regional EMBL groups idea being floated by Kafatos is backed enthusiastically by southern European biologists. The plan is to set up small international research groups consisting of a leader who is not a national of the host country, a postdoc, a graduate student, and a technician. Centers in EMBL's member states—which include Spain, Greece, and Italy, but not Portugal—would submit competing proposals to host the groups. Southern European biologists say that, by connecting world-class groups with otherwise isolated national centers, the program should have an important catalytic effect. And many see an opportunity to import cutting-edge techniques, such as the production of gene knock-out mice—

engineered strains in which a specific gene has been inactivated. "We'd like to use regional EMBL groups to bring this modern biology into Spain," says CNB immunologist Carlos Martínez-A.

Kafatos could have trouble finding the funds for the program, however. Eventually, he wants to create a network of around 50 groups, spread throughout Europe. But EMBL's resources will stretch only to a pilot program of five groups, costing

around \$1.4 million annually. And if Italy does withdraw from EMBL, removing its \$6 million annual contribution, it's unlikely that the pilot program could be relaunched immediately with the four groups currently earmarked for Italy relocated to Spain or Greece.

In any case, Kafatos says that outside funds must be found for the larger network, and the likeliest source seems to be the EU's research program. Sometime later this year, science ministers from the union's 12 states will sit down to set priorities for the EU's science budget over the next 5 years. Biologists across southern Europe hope that they will look favorably on Kafatos' initiative. "For us," says physiologist Eladio Montoya of Madrid's Alcala de Henares University, who represents Spain on EMBL's governing council, "this would be perfect." And combined with an injection of cash from the EU structural funds, it might just be enough to turn southern Europe's potential biology Renaissance into reality.

—Peter Aldhous



Up and coming. Immunologist Maria De Sousa says Portugal now has a dozen first-class labs.

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