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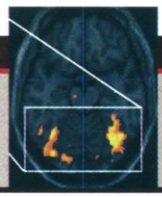
A plethora of free-floating bodies



1684
Distracting clutter

EUROPEAN SCIENCE

Flagship E.U. Research Program Aims for Pan-European Panacea

Hoping to breathe new life into the Old World's fragmented scientific community, the European Commission last week approved the first draft of a 4-year, $16.2 billion research program that seeks to focus the European Union's disparate research programs on common goals. Slated to spend 17% more than its predecessor, the so-called Framework 6 (FP6), which will begin in 2003, would spur more pan-European scientific projects by channeling funds into big-ticket collaborations and paying for more scientists to country hop. "This is potentially tremendous for research, especially projects that involve expensive instruments, such as synchrotrons and neutron sources," says geophysicist Vincent Courtillot, research director of France's Science Ministry.

The most striking aspect of the FP6 proposal, which must run a gauntlet of European institutions before it's finalized next year, is the European Research Area (ERA) concept. The brainchild of research commissioner Philippe Busquin, the ERA is meant to reduce what Busquin calls the "fragmentation and isolation" of Europe's national research efforts (*Science*, 21 January 2000, p. 405). As a whole, E.U. nations invest 1.8% of their gross domestic products in R&D (an anemic figure compared to the United States' 2.7% and Japan's 3.1%), and their combined research spending was about $64 billion less than U.S. R&D outlays in 1999. Although Framework programs represent only about 5% of Europe's total R&D spending, Busquin has been searching for better ways to use that money as a lever to boost the impact of multinational E.U. research.

Picking up on the ERA theme, the FP6 draft proposes new ways to help national research ministries and granting agencies open up their programs to researchers in other countries. For example, the $2.8 billion proposed for "Structuring the European Research Area" includes a doubling (to nearly $1.7 billion) of the pot of money available for the popular "mobility" program that gives grants to European scientists who shift to labs in other E.U. countries. The ERA "is an idea whose time has come," says Dutch astronomer Reinder van Duinen, president of the European Science Foundation, which also has launched initiatives to better coordinate European research. "Sometimes you need a collaborative approach to tackle a major problem."

The FP6 draft also promotes the ERA concept by encouraging larger research consortia, such as labs or institutes, to team up in applying for grants to achieve "a substantial reduction" in the number of projects and contracts. In addition, the program would hand out grants in fewer priority areas than Framework 5 now encompasses (see table). An E.U. official says the goal is "larger, critical-mass funding" and more incentives for national research efforts to dovetail with wider European research themes. "We've taken a more strategic point of view, to foster more concentration and to help integrate national research programs," says the E.U.'s Richard Escritt, who helped develop the FP6 draft. Courtillot hopes that the new approach might "reduce the cumbersome administration" of Framework grants in Brussels.

Visionary. Next Framework program embodies Busquin's European Research Area.

Taking the ERA idea a step further, several research ministries persuaded E.U. officials to include in FP6 the possibility for groups of E.U. nations to team up and apply for funding for major projects in areas such as genomics, nanotechnology, or supercomputer research. "We need to do some experiments to test how this could work," including pilot trials among budding collaborators, says Courtillot, who last week met with his counterparts in Germany and the United Kingdom to begin hashing out ideas for such big projects.

The proposed Framework program doesn't settle one hot-button issue: the extent to which Brussels should help support and maintain expensive European facilities such as synchrotrons and Rome's European Mouse Mutant Archive. Although the FP6 draft sets aside about $830 million for infrastructure initiatives, the policies are still being debated. The Research Directorate is putting the finishing touches on a new report, "A European Research Area for Infrastructures," that's expected to urge FP6 to provide seed money for new scientific instruments or labs that have "a clear European dimension or interest." But the directorate wants to avoid long-term commitments to paying part of the operating costs of European-level labs.

Some European science managers who give the FP6 draft high marks for setting noble goals worry about how it will be implemented. For instance, Kai Simons, director of the Max Planck Institute for Molecular Cell Biology and Genetics in Dresden, Germany, supports the draft's incentives to spur pan-European collaborations, but he questions whether there would be enough grants for young scientists and enough funds for "generic" research that is "not bound to anything except quality."

As the FP6 draft winds its way through the European Parliament and the council of

THE FUTURE OF EUROPEAN SCIENCE

Category	Funding*
Information technology	$3.31 billion
Genomics and biotechnology	$1.84 billion
Sustainable development and global change	$1.56 billion
Nanotechnologies, intelligent materials, and new production processes	$1.20 billion
Aeronautics and space	$0.92 billion
Food safety	$0.552 billion

* Proposed FP6 category totals, 2003–06.

CREDITS: (TOP TO BOTTOM) KARIM IBOURKI/PHOTO NEWS; SOURCE: EUROPEAN COMMISSION

member nations before it is finalized early next year, the European Union's smaller states are expected to take aim at the large sums that could fund collaborations among bigger countries. But some scientists with a European vision hope that FP6 will become a milestone on the road to what virologist Paolo Lusso of Milan's San Raffaele Scientific Institute would like to see: what he calls "the research community of the 'European nation.'" –ROBERT KOENIG

FOOT-AND-MOUTH DISEASE

U.K. Outbreak Is Latest In Global Epidemic

CAMBRIDGE, U.K.—What began in late February as a single pig farm blighted by foot-and-mouth disease (FMD) could spiral into a full-blown epidemic in the United Kingdom, experts say. The reappearance of the dread disease here seems to be the latest twist in a yearlong rampage around the world of a virulent strain of foot-and-mouth virus.

As *Science* went to press, 16 farms across the U.K. had reported cases and been quarantined, and the government had prohibited the movement of susceptible animals: primarily cows, sheep, pigs, and goats. Thousands of animals have been slaughtered and burned atop huge pyres in a bid to halt the disease's spread. The U.K. may be on the brink of a reprise of the 1967 scourge that saw 500,000 animals destroyed. "There is every likelihood that the disease will reach epidemic proportions," says Liz Glass, a veterinary immunologist at the Roslin Institute in Edinburgh.

The outbreak apparently originated on a pig farm in Newcastle, England, probably from infected animal feed imported from Asia. The U.K. strain is identical to one that recently stormed previously disease-free countries such as Japan, North Korea, and South Africa. "It seems to be a very virulent and successful strain" in all susceptible species, says Paul Kitching of the Institute for Animal Health (IAH) in Pirbright, U.K., who heads the world's largest FMD research group.

The viruses that cause FMD (members of a diverse family of small RNA viruses called picornaviruses) are not all that deadly; they can cause fatal cardiac arrest in young animals, but most adult animals recover. But animals produce less meat and milk after an infection, so the only economically sensible option is to cull infected herds. And that has to happen fast, because FMD is extraordinarily infectious: Inhaling fewer than 10 viral particles can infect an animal, and the wind can carry virus from one blighted farm to another, even dozens of kilometers away.

A vaccine was first developed in the 1960s, and the IAH stocks enough to vaccinate 500,000 animals in an emergency. The vaccine, which consists of a virus that has been killed with chemicals or ultraviolet light, offers a good degree of protection, says Martin Hugh-Jones, a veterinary epidemiologist at Louisiana State University in Baton Rouge. For instance, it has enabled South America to all but eradicate the disease from the continent.

But the vaccine has been known to cause occasional outbreaks, presumably because the procedure used to kill the virus is imperfect. So although it's an important weapon in endemic areas, the vaccine is risky in countries that are currently disease free. Vaccinated animals can also be carriers of the virus—although they show no symptoms—and spread it to other, unvaccinated animals. And finally, once vaccinations are used, it is much harder for a country to show that it's disease free; the virus could be lurking in a small number of animals. "Better to keep them all susceptible," says Hugh-Jones, "and shoot your way out when an outbreak occurs"—as Britain is doing now.

CREDIT: BRIDGET JONES/AP

Batten down the hatches. Like farms across the U.K., parks were closed to protect susceptible wildlife, including deer.

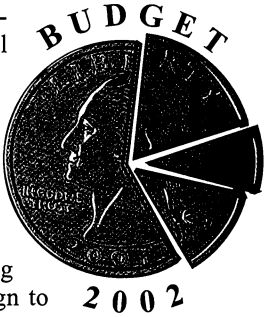
Several research teams have tried to produce a vaccine that doesn't have these drawbacks. In the past, attempts to develop a vaccine based on foot-and-mouth virus peptides failed to offer adequate protection, as did a live, weakened virus. Researchers at the U.S. Department of Agriculture's (USDA's) lab in Plum Island, New York, have now set their hopes on a crippled adenovirus that has been equipped with two extra proteins from the foot-and-mouth virus. The vaccine is safe and protects pigs well, says USDA virologist Marvin Grubman; the first experiments in cattle are "encouraging," too, he says. But Grubman says it will be years before the vaccine hits the market. Until then, aggressive monitoring and slaughter is the control method of choice for disease-free countries.

–JOHN PICKRELL AND MARTIN ENSERINK

2002 BUDGET

NIH Gets Big Boost; Lobbyists Want More

Sometimes good just isn't good enough. President George W. Bush said last week that he will request a record $2.8 billion increase for the National Institutes of Health (NIH) in his 2002 budget proposal. But some biomedical science groups say that the figure—a 13.8% boost, to $23.1 billion—is only a starting point for their campaign to win a $3.4 billion boost.



"We will work in a bipartisan fashion with our congressional champions ... to increase the agency's budget," vowed Mary J. C. Hendrix, president of the Federation of American Societies for Experimental Biology. The 60,000-member group has helped lead an effort, begun in 1998, to double NIH's budget to $27.3 billion by 2003.

Maintaining a long Washington tradition of previewing the good news—and keeping silent about the bad—in upcoming White House budget proposals, Bush briefly mentioned his plans for NIH during a photo opportunity on 23 February, 4 days before outlining to Congress and the nation his spending proposal for the 2002 fiscal year, which begins 1 October. (The budget was unveiled after this issue of *Science* went to press; the details will be reported in next week's is-