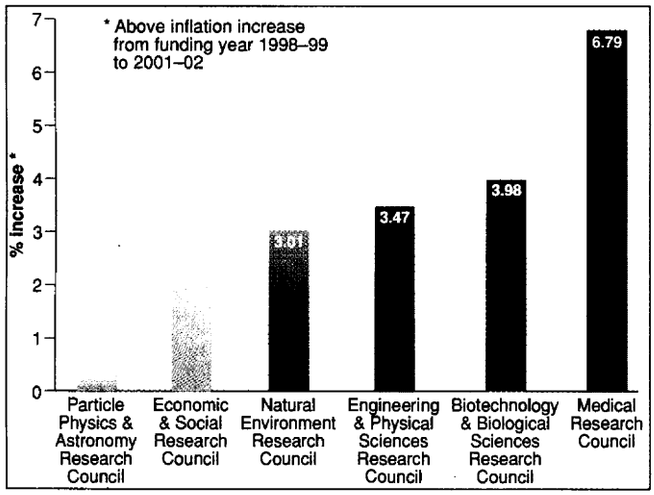
Natural Environment Research Council (NERC) and the Biotechnology and Biological Sciences Research Council (BBSRC)—will get increases of more than 3% above inflation. BBSRC says it plans to back more projects that attempt to exploit novel gene products as therapeutics and other high-value chemicals, while NERC is planning a program of research on genomes and the environment, such as looking at how the genomes of different populations of plants may affect their response to climate change. The smaller Economic and Social Research Council, which has also won an increase, is expected to step up funding on the social and ethical implications of genetic research.

The MRC's budget increase—a total of $144 million over the next 3 years—will allow it to expand existing work in three priority areas. The council will devote an as-yet-undecided sum to boost research on mouse genetics, including sequencing more of the mouse genome and developing mutant mouse strains. "With genome sequence data and the ability to develop new mutant strains, the mouse is a powerful way to get models for human diseases," says geneticist Nick Hastie of the MRC Centre for Human Genetics in Edinburgh, part of the mouse genetics effort.



Biology boost. Life sciences get the biggest rises in Britain's 3-year budget allocation.

The MRC is also putting $13 million over the next 3 years into a new center aimed at converting advances in the molecular analysis of cancer into improved patient treatment. The new center, which will be established in collaboration with Cambridge University and a medical charity, the Cancer Research Campaign, will be headed by cancer biologist Ron Lasky of the Wellcome Centre for Cancer and Molecular Biology in Cambridge. It will be up and running by early 2001. Among the initial goals will be the development of tests for early diagnosis of common cancers, including cervix, lung, breast, and colon. Longer term goals include better diagnostic analysis of tissue samples to determine how far the disease has progressed and tracking down genes that predispose people to cancer.

The third MRC initiative will focus on the study of so-called new variant Creutzfeldt-Jakob disease (CJD), the fatal brain disorder linked to mad cow disease that has so far killed 29 people. The MRC will set up a new center in London based around the unit headed by molecular biologist John Collinge at the Imperial College School of Medicine at St. Mary's Hospital. "We hope to develop a critical mass of around 60 people," says Collinge. He will be joined next year by another leading specialist in the field, molecular biologist Charles Weissman of the University of Zurich. The MRC plans to provide $2.4 million a year in addition to funds Collinge will receive as a principal fellow of the research charity the Wellcome Trust. A high priority for the new center will be the development of simple new tests for the hallmark "prion" protein that has been linked to the disease. A screening test is urgently needed for blood samples to ensure that the disease is not spread through transfusions and to detect the protein in tissues such as tonsils.

Physical scientists have feared that the government's enthusiasm for biology would leave them out in the cold. But they can take some comfort from the new allocations. The Engineering and Physical Sciences Research Council won a respectable 3.4% increase in real terms. And even the hard-pressed Particle Physics and Astronomy Research Council (PPARC), with an increase of just 0.55%, won added security through a new contingency fund designed to absorb currency fluctuations that can increase subscriptions to bodies such as the CERN particle physics center near Geneva. "Our domestic budget has now been assured, and the problems created by currency fluctuations for our overseas commitments have also been addressed to help plan our future," a spokesperson says. But Astronomer Royal Martin Rees of the University of Cambridge says that the budget outcome is very disappointing. "It's a pity PPARC did not make a better case for addi-

CREDITS: (LEFT) U.K. OFFICE OF SCIENCE AND TECHNOLOGY; (RIGHT) UNIVERSITY OF OREGON

ScienceScope

FAST TRACK FOR SEQUENCES?

For scientists interested in the human genome, the wait for sequence data can be painfully long. But the National Institutes of Health (NIH) is taking steps to speed up the process for the most biologically interesting regions.

The new procedure will make use of an international peer-review panel, Francis Collins, director of NIH's National Human Genome Research Institute, told researchers last week at a Denver meeting of the American Society for Human Genetics. The panel will review requests from teams hoping to have a particular region of the genome sequenced sooner rather than later. If the panel decides the arguments are compelling, "then that sequence moves to the top of the list for the center that's working on that chromosome," says Collins. He hopes to have the system in place by early next year.

A NEW HAUL OF GENOME PROJECTS

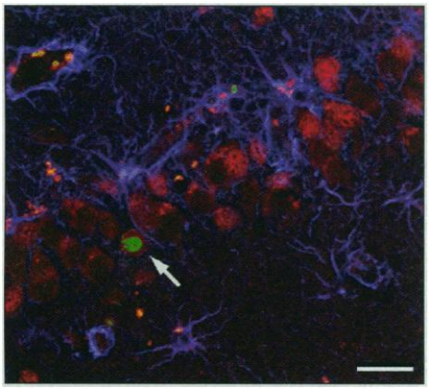
Add social amoebas—once known as slime molds—and the zebrafish to the growing menagerie of organisms having their genes mapped or sequenced. Amoeba researchers hope to discover the basic genes that make multicelled organisms possible, while zebrafish geneticists are fishing for clues to human diseases and development.

The zebrafish project, begun in September, has wide appeal: Thirteen of the National Institutes of Health (NIH) have pledged a total of $4.7 million to fund five 3-year grants to map 10,000 *Danio rerio* genome markers. Biologists hope the map will help them connect hundreds of known fish mutations to human genes and diseases (*Science*, 14 February 1997, p. 923). Two reports in the November *Nature Genetics* of the first examples of zebrafish models for human disease—porphyria and a type of genetic anemia—are just "the tip of the iceberg," says Leonard Zon of Children's Hospital in Boston.

This week, the European Union joined the NIH and the Deutsche Forschungsgemeinshaft in a $2.7-million-a-year effort to sequence the amoeba *Dictyostelium*'s 34 million base pairs. Three labs are working on the 3- to 5-year project.

the birth of neurons in adult brains have been seen in other mammals. But identifying them in humans was a demonstration that could be critical to future therapies for diseases such as Parkinson's or Alzheimer's. The stem cell results, reported in the November issue of *Nature Biotechnology*, "provide proof of principle that you can do this with human cells, and that is a necessary step on the way to using these cells in the treatment of human diseases," says developmental neurobiologist David Anderson of the California Institute of Technology in Pasadena. And the discovery of neuron growth, reported in *Nature Medicine*, raises an even more enticing—although distant—prospect: inducing patients' own brain cells to regenerate neurons lost to disease.

The two teams that discovered the stem cells, led by Evan Snyder at Harvard Medical School in Boston and by Ronald McKay of the NINDS, both began by culturing cells from the brains of aborted human fetuses. The first clue that the cultures contained stem cells was the fact that some of the cells would differentiate into the three main types of brain cells: neurons and two types of support cells called glia. The true test of a stem cell, however, is to show that one cell can give rise to all the different cell types of a tissue. (For reports on stem cells from an earlier stage of development, which can differentiate into a wider range of tissues, see pp. 1014 and 1145.)



Newborns. BrdU (green) integrated into the DNA marks new cells, which stain as neurons (red) rather than glia (blue).

CREDITS: (TOP) ERIKSSON *ET AL.*, *NATURE MEDICINE* 4, 11 (NOVEMBER 1998); (BOTTOM) S. STRICKLAND/NATURESCAPES

To show that they had neural stem cells, Snyder's team cloned a single cell and then showed that cells from that cloned culture could differentiate into glia and a variety of neuronal types when they were put into developing mouse brains. McKay's group didn't develop clones of identical cells. But they did transplant sets of cells that appeared identical into the brains of fetal rats in utero and found that the cells joined the rats' own neurons in forming various kinds of brain tissue. While acknowledging that there is much more research to be done, Snyder says he hopes the field will be ready "to start applying this to human diseases within 5 years."

The prospect of coaxing the brain to heal itself is even more distant. But thanks to work by Fred Gage of the Salk Institute in San Diego and Peter Eriksson and his colleagues at the Sahlgrenska University Hospital in Göteborg, Sweden, it is no longer considered impossible.

For years neurobiologists thought that no new human brain neurons are generated after birth. That view was bolstered in the 1980s by work in which Pasko Rakic's team at Yale University found no evidence that neurons are dividing in the brains of rhesus monkeys. However, researchers later turned up evidence of new brain neurons in adult rodents, tree shrews, and marmoset monkeys. But no one had come up with a way to perform the absolute test—looking in human brains.

To answer the question once and for all, Gage, Eriksson, and their colleagues took advantage of a cancer study in Sweden. Patients had been given a marker chemical called bromodeoxyuridine (BrdU), which is incorporated into the DNA of dividing cells, to follow the growth of their tumors. After five of those patients died, the scientists examined samples of their brain tissue. They found BrdU-labeled neurons in the dentate gyrus, a small part of the brain area called the hippocampus, which is involved in forming memories. This was a telltale sign that those cells had been recently formed by the division of precursor cells.

This means, says Gage, that "neurogenesis does not stop phylogenetically at [marmosets]" and that human brains do replace neurons. In fact, Rakic says that, with techniques similar to Gage's, his lab has filled in the missing link between humans and marmosets by finding evidence of new neurons in the dentate gyrus of rhesus monkeys. They will present the finding at the annual meeting of the Society for Neuroscience in Los Angeles next week.

Rakic and Gage caution that the practical significance of the discovery is unclear. The dentate gyrus is just one small brain area, says Rakic, and "the principle [of no new neurons] still applies for most structures of the brain." Gage adds, "We don't have any evidence that these cells are hooked up in any way" to functioning neural networks.

But the finding could mean that researchers might someday learn how to encourage regeneration in other parts of the brain, such as areas hit by neurodegenerative disorders. That's a tall order, but it is a concept that people "weren't even thinking about" before this finding, says Gage.

—MARCIA BARINAGA

ScienceScope

TIMING TROUBLES AT NASA

As in comedy, timing can be everything when it comes to setting priorities for space science. Last week, members of a NASA science advisory panel said they are worried that the agency's timetable for an upcoming 3-year strategic plan doesn't leave enough time for input from space scientists participating in a similar blue-ribbon study being conducted by the National Academy of Sciences. Both efforts are intended to influence the direction of space studies in the next decade.

Researchers would like to see NASA push back the deadline for its report, which is due in June 2000, in order to influence congressional debate on the agency's 2001 budget. The academy's review, done every 10 years, is set to begin in January and also finish in mid-2000. "If the two reports are perceived as saying different things," says Dan Lester of the University of Texas, Austin, "the science community could shoot itself in the foot."

EPA INVITES COMMENT ON PESTICIDE POLICIES

Chemical industry officials have won the chance to comment on key pesticide science policies that will guide enforcement of a 1996 food safety law—despite complaints by environmental advocates that what's needed is action, not more words.

Last week, the Environmental Protection Agency (EPA) released a plan for receiving public comments over the next year on nine key technical issues raised by the law. They range from how to statistically analyze human exposure to pesticides to how to deal with chemical residues on food that may be dangerous but are not measurable with existing equipment.

Industry representatives serving on an EPA advisory panel successfully pushed for the chance to comment on what they see as an overly strict interpretation of the policies, which will shape enforcement of the law. But one environmentalist says some companies are just trying to slow things down. "EPA has received more than enough information on these issues," says Ken Cook of the Environmental Working Group. "It should be regulating instead of issuing documents."

Contributors: Christie Aschwanden, Gretchen Vogel, David Malakoff