ble degrees and transferable credits (see table). In addition, the parties aim to develop a European joint degree program that would be based on courses taken at two or three institutions in different countries. Lowering these and other administrative barriers should help slow or reverse a brain drain from Europe to U.S. institutions, they believe.

"We have made strides toward the goals of stimulating mobility and encouraging more reforms in higher education that already are taking place in much of Europe," says Sweden's education and science minister, Thomas Östros. He co-chaired the meeting with Eduard Zeman, education minister of the Czech Republic, who believes that the integration of Europe's universities into the mainstream will accelerate the overall process of European unity. "Today's universities are tomorrow's Europe," he says.

The movement toward a common set of administrative practices began at a small Paris meeting in 1998 and was fleshed out the next year at Bologna. There ministers from two dozen countries called for replacing the complex, confusing, and sometimes nontransferable degree systems in many European countries with "easily readable and comparable degrees." That would include the use of bachelor's and master's degrees in most fields. Other goals include a strengthened accreditation system, often called "quality assurance," and a freer flow of students and researchers across national borders.

Although there has been progress, some obstacles won't be easy to remove. "There are still great differences in the systems of quality assurance for higher education in European countries," says Jacob Henricson, a Swedish student who chairs the National Union of Students in Europe. And some officials warn that going too far could cause an unwanted homogenization of higher education. France's education minister, Jack Lang, for example, argued strongly for the importance of maintaining diversity—especially in languages and curricula—in the midst of harmonizing degree and credit systems. Others defended the value of keeping the typical European degree system for medicine, engineering, and law, in which students begin their specialized studies right after secondary school and do not earn a bachelor's degree along the way.

The U.K.'s education minister, Tessa Blackstone, said that she would oppose any effort to interfere with a particular university's curricula and independence. But she welcomes better coordination to combat "huge competition from U.S. universities." These and other issues will be discussed at the next meeting of ministers, set for Berlin in spring 2003. –ROBERT KOENIG

A WISH LIST FOR EUROPEAN UNIVERSITIES

- Comparable degrees
- Undergraduate and graduate programs
- Transfer of course credits
- Greater mobility
- Institutional accreditation
- Joint degrees

Open minded. Historically isolated, prominent universities such as Oxford are taking steps to become more accessible to students and faculty members from other countries.

HUMAN EXPERIMENTATION

Bioethics Panel Urges Broader Oversight

The U.S. government should create a single office to monitor both public and private research involving human volunteers, says a new report by a presidential commission. The report, 5 years in the making, concludes that major changes are needed in the oversight of clinical research. But it's not clear if the new occupant of the White House is listening.

The National Bioethics Advisory Commission (NBAC) adopted its findings on 15 May and will publish a complete report in late summer.* What NBAC cannot do, however, is ensure that the government pays attention to these long-debated conclusions. The president who sought this advice—Bill Clinton—is gone, and the new Administration is far from attuned to these concerns, with no science adviser and a skeletal scientific staff.

> **The findings "reflect a dual commitment to the protection of ... volunteers while supporting the advance of science."**
>
> **—NBAC report**

The new NBAC report is the broadest of several the panel has issued since 1996. Chaired by Princeton University president Harold Shapiro, the panel has tackled a variety of focused issues, from how to obtain consent from people with impaired judgment to the ethics of running tissue collections. The recommendations issued last week, which represent its cumulative investigations, "reflect a dual commitment to ensuring the protection of those who volunteer for research while supporting the continued advance of science."

The commission did not find evidence of widespread problems in either public or private human subjects research, says its executive director, Eric Meslin. But it "felt that the principle of respect for participants in human research is one that extends to all participants, regardless of funding source." At present, privately funded research comes under government review only if it is part of a government-funded project or is being used to support drugs under review by the Food and Drug Administration.

The new office, which the panel labeled the National Office for Human Research Oversight, would set policy, issue and enforce regulations, oversee research, and disseminate information. It would not fall under the jurisdiction of the Department of Health and Human Services (HHS), parent to the 1-year-old Office for Human Research Protections (OHRP), the current overseer of federally funded clinical research. But Robert Rich of Emory University in Atlanta, Georgia, president-elect of the Federation of American Societies for Experimental Biology (FASEB), doesn't see the need for such a change. The existing OHRP "has all the tools it needs" to oversee human subjects research, he says, and a panel housed outside HHS would be subject to greater political pressures.

NBAC also seeks to clarify the definition of human subjects research and cover a broader swath of activities. The government, it says, should keep tabs on any "systematic collection or analysis of data [involving human subjects] with the intent to generate new knowledge." The policy would also apply to medical databases and tissue collections. All studies of more than minimal risk should be approved by an independent review board, NBAC says, and at least 25% of the members of such panels should be "unaffiliated with the institution" and focus on "nonscientific areas."

Although most of NBAC's recommendations are designed to close loopholes in the current system of research monitoring, some are designed to remove excessive paperwork. For example, the panel says that reviews of

* www.bioethics.gov

CREDITS: (LEFT TO RIGHT) TABLE SOURCE: PRAGUE COMMUNIQUE, 2001; ADAM WOOLFITT/CORBIS

informed consent should focus on the process and substance of informing volunteers rather than on obtaining a signed document, and it suggests that some procedures should be exempt from routine consent requirements if the risks are truly "minimal."

The new report also could be the panel's swan song. Meslin says the commission has received no word on whether its charter, which expires in October, will be extended. Even if the NBAC report is ignored, however, the idea of a new oversight body has been embraced by the biomedical community. On 23 May a consortium of six university and research groups—including FASEB—announced the formation of the Association for the Accreditation of Human Research Protection Programs. The association will operate a voluntary national accreditation program to monitor clinical research carried out with either public or private funding.

–ELIOT MARSHALL

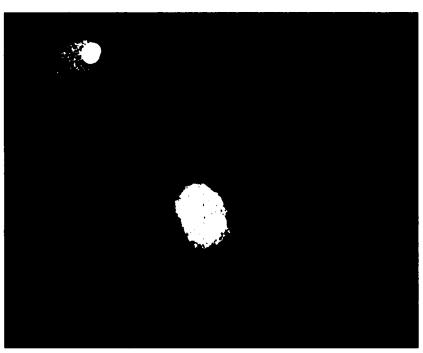
With reporting by Gretchen Vogel.

CELL BIOLOGY

Protein Clumps Hijack Cell's Clearance System

Although Parkinson's, Huntington's, amyotrophic lateral sclerosis, and other neurodegenerative diseases cause very different behavioral symptoms, inside the neuron they look a lot alike. All are marked by big intracellular clumps of protein that scar neurons targeted by the disease. But researchers haven't known whether these protein clumps cause neurological damage themselves or are mere byproducts of some other system gone awry.

Now a study on page 1552 suggests that protein aggregates can directly damage cells by hijacking a cellular quality control mechanism, the ubiquitin-proteasome system (UPS). Normally, the UPS seeks out and destroys misshapen proteins inside the cell—including those that tangle up into clumps in neurodegenerative disease. But in cells artificially induced to churn out clump-prone proteins, the system stalls. Protein tangles thus apparently "initiate a vicious cycle," says Susan Lindquist of the University of Chicago. "The study suggests very nicely that there is an interplay between the two: As proteins start to accumulate, they put stress on the UPS. This in turn causes more proteins to accumulate, which in turn puts more stress on the UPS."



CREDIT: N. F. BENCE *ET AL.*

Overwhelmed. Cells with clumps of proteins (yellow) can't clear an aberrant protein marker (green).

A stressed-out UPS spells trouble for the cell. As many as 80% of the proteins a cell produces don't fold correctly, points out Alfred Goldberg of Harvard Medical School in Boston; the UPS destroys them before they cause damage. Ubiquitin tags abnormal proteins for destruction, and the proteasomes chew up those ubiquitinated proteins. If proteasomes are stifled by inhibitors, even healthy cells accumulate abnormal proteins in thickets similar to those seen in neurodegenerative diseases. These cells can't reproduce, and they're likely to die.

Earlier research uncovered suggestive links between the UPS and neurodegenerative diseases. Mutations in UPS-related genes can cause early-onset forms of Parkinson's disease, for instance. And protein clumps inside diseased neurons are studded with both ubiquitin and proteasomes.

To test directly whether protein clumps can hobble the UPS, Ron Kopito and colleagues at Stanford University developed an easy-to-read tracer, composed of a fluorescent protein attached to a protein fragment that sends an "eat me" signal to the UPS. If the clearance system is working efficiently, it destroys the tracer and the cell's fluorescence quickly dims.

The researchers engineered cells to produce one of two proteins—one involved in cystic fibrosis and the other in Huntington's disease—both of which tend to aggregate. In cells with clumps of these proteins, the researchers found, the fluorescent tracer glowed robustly, indicating that the UPS was powerless to break it down.

Although they're not sure how tangled proteins shut down the UPS, one possibility is that "the proteasome is, as we put it, frustrated," says Kopito. Abnormal proteins are sucked into the proteasome through a small opening, like someone slurping a strand of spaghetti. If the protein is tangled into a clump, the proteasome can't pull it in. But, because the proteasome is a "possessive enzyme" that holds onto its prey, it also can't let go. "The proteasome is basically out of commission," says Kopito, which prevents it from chasing down new, badly built proteins, and the problem escalates. Either player in the drama—an excess of misfolded proteins or a glitch in the UPS—could trigger the cycle, Kopito says.

A malfunctioning UPS could be partly at

ScienceScope

Germany's Space Future For the first time in nearly 2 decades, Germany has an official space policy. The plan, approved by the cabinet last week, commits $3.8 billion to space R&D over the next 4 years. But some researchers worry that homegrown science will be squeezed to accommodate international projects.

The new policy will give Germany "the necessary planning security" to fund both national projects and long-term partnerships with the European Space Agency (ESA) and other nations, says Walter Kröll, chair of Germany's aerospace research center in Cologne. But critics note that the lion's share of the funds will go to ESA projects and the international space station, leaving just $150 million a year for domestic programs.

Astrophysicist Wolfgang Hillebrandt, a director of the Max Planck Institute for Astrophysics in Garching, says that greater levels of support are needed so that German researchers "can participate in the science that is part of the ESA missions."

Reducing the Mortgage The National Cancer Institute (NCI) is moving to rein in the explosive recent growth of its $1.7 billion grants portfolio. NCI chief Richard Klausner told an advisory board this week that the number and size of NCI's extramural grants has been growing faster than the agency's budget, prompting at least two new rules. One limits researchers applying for renewals of 3- or 4-year grants to no more than a 20% increase (and he predicts most will get substantially less). The other will require the growing number of scientists seeking especially large grants—$500,000 or more—to enter a separate competition for a specified pool of funds.

Klausner says the changes will help NCI, the largest member of the National Institutes of Health (NIH), make a smooth transition to the slower budget growth expected when Congress completes an NIH budget-doubling push in 2004. He noted that NCI's spending on grants grew 17% last year, compared to a 13.5% overall budget increase—growth that "cannot be sustained with anticipated funding," he says. "Eventually, the numbers come back to bite you."

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