decided to marry education with culture and has put forward Viviane Reding, a former Luxembourg journalist, to head this new directorate. But Prodi plans to shift agricultural research into Busquin's directorate.

The new commission is being formed now because of the mass resignation last March of the previous incumbents in the wake of a scathing report by a European Parliament investigative panel that had alleged cronyism and mismanagement among Brussels officials, with Busquin's predecessor, Edith Cresson of France, one of the most heavily criticized (*Science*, 19 March, p.1827). Prodi called the new candidates "a top-quality team in which jobs have been allocated to match the proven abilities and experience of each commissioner." He said he would demand that the commissioners streamline the Brussels bureaucracy, live up to high ethical standards, and "give clear direction and leadership."

Busquin, 58, is known mainly as the leader of the Socialist Party in Belgium's French-speaking region. He received a physics degree from the Free University of Brussels in 1962 and was an assistant physics lecturer at the university's medical faculty from 1962 to 1977. He studied ecology and environmental issues at the Free University in 1976, and was chair of the board of directors of Belgium's Institute of Radioelements from 1978 to 1980. He entered local Belgian politics in 1977 and later held various national and regional ministerial posts until becoming vice president of the Socialist International, a federation of socialist parties, in 1992. He was elected as a member of the European Parliament last month.

–ROBERT KOENIG

HUMAN GENOME PROJECT

Commercial Firms Win U.S. Sequencing Funds

Several new groups are joining the government's human genome sequencing project this month, including—for the first time—two commercial firms. The National Human Genome Research Institute (NHGRI) in Bethesda, Maryland, quietly awarded three yearlong grants totaling $15 million on 1 July. The winners can expect to be funded for at least two additional years at the current rate, NHGRI notices say. The objective is to scale up production of human DNA sequence and help deliver a 90% complete "working draft" of the human genome for public release next spring and a 99.99% finished version by 2003. NHGRI turned down some academic centers while funding commercial outfits, indicating that it is serious about rewarding efficiency.

The latest grants raise the total NHGRI kitty for human genome sequencing to nearly $100 million per year through 2002. The principal investigators (PIs) leading the newly funded teams are Maynard Olson at the University of Washington, Seattle ($7 million per year); Douglas Smith, co-director of the sequencing center at Genome Therapeutics Corp. of Waltham, Massachusetts, the first commercial firm to take part ($5 million); and Ronald Davis of Stanford University ($3 million). According to documents released by NHGRI, Olson expects to sign a contract with another company, Incyte Pharmaceuticals Inc. of Palo Alto, California, for about $3 million worth of DNA sequencing per year. NHGRI plans to continue funding these teams through 2002.

The newcomers join university-based groups that won larger NHGRI grants in March, including the Whitehead Institute/MIT Sequencing Center in Cambridge, Massachusetts, Washington University in St. Louis, and the Baylor College of Medicine in Houston, Texas (*Science*, 19 March, p. 1822). They are part of an international network that includes the U.S. Department of Energy's Joint Genome Institute in Walnut Creek, California, and the nonprofit Sanger Centre in Hinxton, U.K.

Smith says his group will work closely with the Sanger Centre, focusing mainly on sequencing chromosome 10. The Stanford group, says Davis's colleague Nancy Feldspiel, will contribute some DNA data but, more significantly, develop robotic instruments to make genome work more efficient. Olson will supervise a consortium that includes sequencers at Incyte focusing on chromosome 7 and on automated methods of finishing. All members of this network, including the companies, agree to release raw DNA data on a daily basis, refrain from patenting raw data, and publish finished data within 6 months of "validation."

Geneticist David Cox of Stanford University, whose lab did not get funded in this competition, says: "I think it's a great idea that we're looking for the most efficient ways to get high-quality sequence data."

–ELIOT MARSHALL

NEW RECRUITS

Institution and PI	Award
University of Washington, Maynard Olson	$7 million*
Genome Therapeutics Corp., Douglas Smith	$5 million
Stanford University, Ronald Davis	$3 million

* About $3 million will be subcontracted to Incyte Pharmaceuticals Inc.

IMMUNOLOGY

Keeping Bone Marrow Grafts in Check

Cancer patients who have received aggressive chemo- or radiotherapies often need bone marrow transplants, because the treatments wipe out their immune systems as well as their tumors. But bone marrow transplants (BMTs) often come at a price. Because the donor and recipient tissues usually differ genetically, about two out of three patients develop graft versus host disease (GVHD), in which donor T cells turn against their new host and wreak havoc in organs such as the skin, liver, and the intestines. Fever, rashes, and diarrhea ensue, and in severe cases GVHD can be lethal, making it the primary cause of death after BMTs.

Early warning. Rashes caused by donor T cells attacking and destroying skin cells of bone marrow transplant recipients are an early symptom of GVHD.

To curb GVHD, clinicians either sift out all the T cells from the donor marrow or treat recipients with powerful immunosuppressive drugs. Both approaches leave patients extremely vulnerable to infections, however. A report on page 412 now suggests another, and perhaps less dire, strategy. A team led by immunologist Stephen Emerson of the University of Pennsylvania School of Medicine in Philadelphia has found that GVHD can be suppressed in mice by inactivating the recipients' antigen-presenting cells, or APCs. APCs display snippets of foreign proteins to T cells, sparking an immune response. Suppressing these cells blindfolds the donor T cells toward host cells, the team found. In contrast, the T cells should still be capable of responding to viruses or other pathogens presented by donor APCs from the transplants.

The study "offers a new approach to tackle a problem that has pestered us for the last 25 years from an entirely different angle," says bone marrow transplant specialist Joseph

SOURCE: (LEFT) NHGRI; PHOTO: (TOP) BIOPHOTO ASSOCIATES/PHOTO RESEARCHERS