Research Highlights
2000-2001

The University of Pittsburgh has established itself as one of the nation's pre-eminent research institutions. A sampling of research endeavors that have been initiated or accomplished during the year are presented below.

School of Medicine studies sleep schedules for NASA Researchers in this school are helping the space agency to determine the safest method for rearranging astronauts' sleep schedules to meet time-critical mission demands. Participants in the study spend 16 days in Western Psychiatric Institute and Clinic's Biological Rhythms Laboratory, a completely enclosed living space in which there are no clues as to the time of day.

University of Pittsburgh's Division of Geriatric Medicine is designated as a National Center of Excellence in Geriatric Medicine This designation, by the John A. Hartford Foundation, is accompanied by a grant of $500,000. The School of Medicine and the UPMC Health System serve a significant number of elderly patients in the region. The Division of Geriatric Medicine is known nationally for its research in medical ethics, nutrition, home care, urinary incontinence, the epidemiology of aging, osteoporosis, the evaluation and management of chronic pain, the epidemiology and implications of cardiac disease, and dementia and behavior management.

McGowan Institute for Regenerative Medicine to develop tissue engineering, artificial organs and related therapies The School of Medicine and UPMC Health System have established this new institute to serve as a single base of operations for the University's leading scientists and clinical faculty involved in the emerging field of regenerative medicine. These researchers work on the development of tissue engineering, cellular therapies, biosurgery, and artificial and biohybrid organ devices. It is expected that the new institute will devise innovative clinical protocols as well as pursue rapid commercial transfer of its technologies.

Pittsburgh Supercomputing Center installs the most powerful system in the world committed to unclassified research The Terascale Computing System (TCS) has been successfully installed at the Pittsburgh Supercomputing Center. The TCS was deployed and implemented by the Center in collaboration with the Compaq Computer Corporation, with funding from the National Science Foundation. The TCS provides computational capability to scientists nationwide who will use it in such research areas as earthquake modeling, storm-scale weather forecasting, global climate change, and protein genomics. Protein genomics is modeling that is integral to the development of new drug therapies. With peak capability of six teraflops – six trillion calculations per second – the TCS is the most powerful system available as an open resource for researchers.

School of Nursing researchers to develop a monitoring technique that will improve outcome for patients recovering from subarachnoid hemorrahage (SAH) A four-year $1.7 million National Institute of Nursing Research grant is funding a study in which this school's researchers plan to develop a monitoring technique that will improve outcomes for patients recovering from subarachnoid hemorrhage (SAH). SAH is a clinical emergency that usually causes a sudden rupture of a cerebral vessel and hemorrhage into the space between the brain and the arachnoidea, which is the delicate membrane that encloses the brain and spinal cord. The research team is using different measures, in combination, that will help clinicians detect when a patient is not getting an adequate blood supply to the brain, well before visible symptoms develop.

Department of Chemical and Petroleum Engineering faculty create molecule-sized networks Researchers in Pitt's Chemical and Petroleum Engineering Department and Physics and Astronomy Department have discovered that adding solid rods – measuring just a few billionths of a meter long – to polymers can dramatically improve the mechanical, thermal, and electrical properties of the mixture. They found that nanotubes embedded in the polymers that naturally repel one another, can align end-to-end, thereby creating possible electrical pathways in the mixture. This enables the nanoparticles to arrange into a network that strengthens the polymer blend. As manufacturers are already aware that adding larger particles to polymers increases strength, this particular study shows that it is possible to increase strength on the nanoscale as well. These findings could lead to faster and easier production of electrically-conducting pathways in insulating materials, or to the creation of reinforcing structures in organic-inorganic composites.

Source: Office of News, Information, and National Media Relations, *Research Review*, Winter, Summer, and Fall 2001.