

# SOUTHWESTERN NEWS

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## NIH funds new bioinformatics resources at UT Southwestern

DALLAS – Oct. 21, 2004 – The National Institutes of Health (NIH) has awarded two collaborative contracts, totaling \$46 million, to Northrop Grumman Corporation's information technology sector. A portion of the funds will be allocated to UT Southwestern Medical Center at Dallas to create two bioinformatics centers designed to help scientists combat infectious diseases and immune disorders.

The contracts were awarded by the National Institute of Allergy and Infectious Disease, part of the NIH, with \$8.7 million designated for UT Southwestern.

The contracts will create separate bioinformatics resources – the BioHealthBase Bioinformatics Resource Center for Biodefense and Emerging/Re-emerging Infectious Diseases, and the Immunology Database and Analysis Portal (ImmPort). Each will include databases and software that researchers can use to improve drug discovery and vaccine development.

“We knew these projects would require joint expertise in biology and computing. This is truly a team effort between information technology systems developers from Northrop Grumman and research scientists from UT Southwestern and elsewhere,” said Dr. Richard Scheuermann, professor of pathology at UT Southwestern and principal investigator of both subcontracts.

The BioHealthBase will focus on research related to how microbes such as the influenza virus and the tuberculosis bacterium, *Mycobacterium tuberculosis*, establish infections and how the body responds to them. A pathogen, such as the tuberculosis bacterium, interacts with cells in the host's body, leading to changes in gene and protein activity within both the bacterium and host cell. In order for the infection to persist, the pathogen must overtake the cell, shutting down various signals or setting up decoys in order to survive undetected.

Current microorganism databases focus on gene-sequence information, said Dr. Scheuermann. Through the BioHealthBase, researchers will not only get gene-sequence information, but will also have access to data on how genes are activated and what happens to the proteins made from those genes. The database will give them information about both what is happening as the microbe establishes itself in the body and as the body attempts to fight it off. Understanding the interface between the infectious agent and the immune response will allow researchers to define potential drug and vaccine targets.

The ImmPort system focuses on immune-system diseases, including allergy, autoimmunity and

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## **Bioinformatics centers – 2**

organ transplant rejection. The goal is to integrate data from different kinds of biomedical research, such as clinical trials, animal modeling and studies using cultured cells, allowing researchers to better identify altered genes and proteins that lead to disease.

Dr. Scheuermann predicts that such a database will enhance the development of novel treatment strategies for diseases like autoimmunity. Researchers will be able to access the ImmPort database and other scientists' data and relate that work to their own. This will help them identify groups of genes and proteins that contribute to the development of disease. From this, they can better devise drugs or treatment options for type I diabetes, multiple sclerosis, systemic lupus erythematosus, rheumatoid arthritis and other diseases.

“The BioHealthBase and ImmPort systems represent bioinformatics paradigms of translational research,” Dr. Scheuermann said of bridging test-tube science to bedside care. “We would like to link all this information so that a person doing an experiment that mimics the immune response in cell culture can integrate the gene expression and proteomics data with results from other investigators focused on clinical trials research.”

BioHealthBase collaborators from UT Southwestern include Dr. Stephen Johnston, director of the Center for Biomedical Inventions, and Dr. Ellen Vitetta, director of the Cancer Immunobiology Center. Others on the project are Vecna Technologies, AMAR-International, and researchers at Mt. Sinai School of Medicine of New York University, University of British Columbia, University of Virginia, and Woods Hole Oceanographic Institute.

UT Southwestern collaborators on the ImmPort project include Dr. David Karp, chief of rheumatic diseases; Dr. Rebecca Gruchalla, chief of allergy; Dr. Laurie Davis, associate professor of internal medicine; and Dr. Ward Wakeland, director of the Center for Immunology. Others include the KEVRIC company; Biomind LLC; Unicorn Solutions; Satyam Computer Service, Ltd.; the Institute for Genomics Research; Centocor; and researchers at Harvard University, Massachusetts General Hospital, University of Virginia, University of California, San Diego, and San Diego Supercomputer Center.

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