



THE RESEARCH FOUNDATION

The State University of New York

SUNY Research Awarded 8 U.S. Patents

April 26, 2005

Next generation innovations range from technique to detect hidden communications to a new anti-cancer drug



A seemingly routine image such as this one might have pages of documents embedded in it without anything being apparent to the human eye.

A reliable technique for detecting steganography — messages hidden in digital pictures and other computer files — is among a number of innovative patents issued to The Research Foundation of State University of New York.

“What makes steganography so potentially dangerous is that not only is the message encrypted, but you don’t even know that it is being sent. Obviously, the ability to detect such communication would be helpful to ensuring national security and preventing industrial espionage,” says Dr. Jessica Fridrich, an expert in steganography and steganalysis and a research professor at Binghamton University, where her work and worldwide recognition have helped to establish a new laboratory dedicated to advancing digital

watermarking and other steganographic techniques.

Through steganography, a message such as a picture or a text can be embedded in a digital photograph or other computer file in such a way that even the presence of such a message is hidden.

One of the first reported cases of steganography was when Alexander the Great caused a courier’s head to be shaved and a message tattooed on his scalp. When the messenger’s hair re-grew, he was able to deliver the communiqué without anyone knowing that he was carrying it.

“Dr. Fridrich and her research team are developing innovations that keep business safe and dramatically improve the nation’s ability to blunt or deter terrorist threats to the United States,” said State University of New York Chancellor Robert L. King. “These patents illustrate the breadth and depth of ideas and discoveries that SUNY faculty are developing to help industry harness next-generation ideas, launch new ventures in key emerging business areas and spur economic development in New York State.”

The detection method and system, awarded U.S. patent [6,831,991](#) on Dec. 14, 2004, involves using steganalysis -performing statistical analysis on the file in question -to detect the presence of embedded information. The technique finds the attempt at secret communication and also indicates the size of the information that is hidden. It was invented by Fridrich and Dr. Miroslav Goljan, research scientists, both of Binghamton University’s Dpt. of Electrical and Computer Engineering. This invention was made with support from the U.S. Air Force.

Patents for inventions that result from sponsored research are awarded to the Research Foundation of SUNY, which is responsible for protecting the intellectual property and commercializing these technologies for public benefit through its Technology Transfer central office in Albany and through satellite offices at State University campuses in Albany, Binghamton, Buffalo and Stony Brook.

“Technology transfer is a critical mission for the Research Foundation, which protects and licenses SUNY faculty innovations,” said Vice Chancellor John J. O’Connor, president of The Research Foundation. “The Research Foundation is a key component in generating new economic activity by ensuring SUNY innovations become tomorrow’s new technologies and commercial ventures.”

Eight patents were issued to SUNY researchers from October 2004 through January 2005: four at Stony Brook University, three at the University at Buffalo, and one at Binghamton University. The other awarded patents, listed by campus, include:

Stony Brook University

Patent Number/Name [6.841.547](#) — Method for decreasing low density lipoprotein using the non-antibiotic properties of tetracycline.

Inventor(s) Dr. Lorne M. Golub, Distinguished Professor, Dr. Maria Emanuel Ryan, professor, and Mr. Hsi-Ming Lee, staff, all in the Department of Oral Biology and Pathology, and Dr. David L. Brown, Chief of Cardiology, School of Medicine, all at Stony Brook University; Dr. Kavita K. Desai, Physician Researcher, Albert Einstein College of Medicine of Yeshiva University/Montefiore Medical Center, Bronx, N.Y.; and Dr. Robert Greenwald, professor of Rheumatology, Long Island Jewish Medical Center

Issued Jan. 11, 2005

Description One of a series of patents related to the non-antibiotic properties of tetracycline. Researchers have discovered that tetracycline in low, non-antibiotic doses, as well as tetracycline that has been chemically modified to be non-antibiotic, has a number of beneficial effects, including significantly reducing low density lipoprotein — the so-called “bad” cholesterol as well as CRP (a protein released by body in response to inflammation and responsible for arteriosclerosis), the two major risk factors in the causation of Coronary Artery Disease. This pioneering invention has major health implications, as it invents a novel drug regimen to potentially prevent and reduce morbidity and mortality due to Coronary Heart Disease, which is the leading cause of death in the U.S. This patent is co-assigned to the Albert Einstein College of Medicine of Yeshiva University, Montefiore Medical Center and The Research Foundation of State University of New York.

Patent Number/Name [6.835.746](#) — New generation congeners of the anti-cancer drug taxol.

Inventor(s) Dr. Iwao Ojima, distinguished professor and director, Institute of Chemical Biology & Drug Discovery and Department of Chemistry, Stony Brook University.

Issued Dec. 28, 2004

Description

The anti-cancer drug taxol, derived from the Pacific Yew tree, has helped many people, but it has one weakness: to be effective taxol must stay in the cell it is attacking. Some cancer cells, such as pancreatic cancer, colon cancer, and other gastrointestinal cancers, are inherently drug resistant. They have “efflux pumps” that push the taxol out of the cell, deteriorating the drug’s effectiveness. The new generation congeners of taxol are orally active and have a built-in mechanism that moderates the cells’ efflux pumps, so the drug can stay in the cancer cell and kill it. This may open the door for fighting cancer by taking pills or capsules instead of infusion or injection.

Patent Number/Name [6.845.542](#) — Portable, fully contained and disposable medical suction device for field use.

Inventor(s) Dr. Jahangir S. Rastegar, professor of Mechanical Engineering; and David Haarhoff, graduate student, Stony Brook University.

Issued Jan. 25, 2005

Description

Whenever someone is injured, the preferred method of cleaning the wound is with suction. Until now, however, portable suction devices suitable for emergency field use (such as on the highway or battlefield) have been complicated, faulty, and expensive. This self-contained, portable, and disposable invention uses compressed air in a can and the venturi effect to clean wounds, clear airways, and store collected material in a plastic bag.

Patent Number/Name [6.803.204](#) - One of a series of patents on two alternatively spliced forms of IKKAlpha, an important chemical involved in the body's immune response.

Inventor(s) Drs. Kenneth B. Marcu, professor of Biochemistry and Cell Biology, and Margery A. Connelly; research assistant professor of Pharmacology, both at Stony Brook University.

Issued Oct. 12, 2004

Description

This invention provides an important tool for scientific and medical researchers who want to develop drugs and treatments for diseases and conditions that involve immune response or tissue rejection. Someday it could lead to better treatments for such common afflictions such as arthritis or auto-immune related diseases.

University at Buffalo

Patent Number/Name [6.820.290](#) — A movable bathroom fixture system that readily adapts to people's needs.

Inventor(s) Drs. Abir Mullick, associate professor, and Edward Steinfeld, professor; both at the School of Architecture and Planning, University at Buffalo; and Drew Kelley, Kelley Design Group.

Issued Nov. 23, 2004

Description The technology used in the movable bathroom concept allows adjustments to meet the changing demands of users and enables the best user-environment fit. The innovation involves two fixtures, the sink and shower, to move around the bathroom wall and adjust in height. This reconfigures spaces, personalizes fixtures to suit body sizes and preferences, and addresses life-cycle needs.

Patent Number/Name [6.839.581](#) — Computer algorithm for detecting Cheyne-Stokes respiration which may be a sign of heart failure.

Inventor(s) Dr. Ali El Solh, associate professor of Medicine, and Dr. Brydon J. Grant, professor of Medicine, Physiology & Biophysics and Social & Preventive Medicine, both at University at Buffalo.

Issued Jan. 4, 2005

Description When patients arrive at the doctor's office complaining of not sleeping well, they may be suffering from sleep apnea. One form of sleep apnea is Cheyne-Stokes respiration, in which the individual breathes very rapidly for several seconds, followed by completely stopping breathing for several seconds. Cheyne-Stokes respiration, in turn, may be a sign of undetected heart failure. Using data gathered overnight from a blood oximeter, this computer algorithm can rapidly determine whether the patient suffers from Cheyne-Stokes respiration, giving physicians a vital clue whether the patient may be at risk for heart failure.

Patent Number/Name [6.831.459](#) — A high-throughput method for obtaining nuclear magnetic resonance (NMR) data that is faster, more cost effective and more precise.

Inventor(s) Drs. Thomas A. Szyperski, professor, Chemistry and Biochemistry, adjunct senior researcher, Hauptman-Woodward Medical Research Institute, and director, University at Buffalo High-Field NMR Facility; Seho Kim, postdoctoral associate, Chemistry; and Hanudatta S. Atreya, research scientist, Chemistry, University at Buffalo.

Issued Dec. 14, 2004

Description

This invention allows researchers to more rapidly collect NMR data, while increasing the accuracy of NMR parameters measured in the NMR spectra. The technique, about 10 to 100 times faster than conventional data collection methods, will help researchers map atoms in protein molecules and will aid the development of new disease-fighting drugs. It will also help researchers make better use of newest generation NMR equipment. This invention was sponsored by the National Science Foundation and National Institutes of Health.

The Technology Transfer Office of the Research Foundation of State University of New York was established in 1979 to identify and protect University-developed intellectual property and serve as a catalyst for economic growth by creating partnerships with business and industry to further research and license inventions for public use. The State University of New York ranks in the top 20 of U.S. patent-generating educational institutions. As of the end of fiscal 2004, more than 700 patents have been issued to the Research Foundation as a result of sponsored program activity, with inventions generating almost \$13.4 million in royalties in fiscal 2004. According to the latest data available from the Association of University Technology Managers, The State University of New York is ahead of research universities like the University of Michigan and John Hopkins for royalties earned on inventions.

Information about SUNY technologies available for licensing is available at the Research Foundation's [Technology Transfer Web site](#).

The State University of New York is the largest comprehensive university system in the United States educating more than 413,000 students in 6,688 fields of study on 64 campuses.