

ACERT ↓

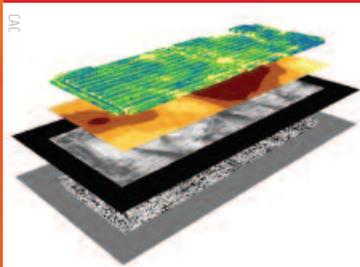
Directed by Jack H. Freed, Chemistry and Chemical Biology, the National Biomedical Center for Advanced ESR Technology (ACERT) develops and implements high resolution electron spin resonance (ESR) for biomedical applications. These include the determination of the structure of protein complexes, including membrane proteins; dynamics of membranes and proteins; and ESR microscopy. The latter efforts are directed to enable the routine imaging of a variety of tissues, cells, and other bio-samples for clinical evaluation as well as for biomedical research. Launched in September 2001, ACERT has been developing four main areas: high frequency ESR, pulsed ESR, applying ESR to micro-imaging, and improving the theoretical and computational methods for analyzing ESR experiments. The short time resolution, enhanced signal sensitivity of ESR and the ability to measure molecular distances on the nanometer scale offer the potential to improve structure/function determination as well as microscopic study of the state of water in tissues/cells, imaging of reactive oxygen species in cancerous cells, drug release by microspheres, and diffusion in cells.



> www.acert.cornell.edu

CAC ↓

The goal of the Cornell University Center for Advanced Computing is to provide Cornell researchers with best-of-breed high-performance computing solutions. CAC works with scientists in Ithaca and at Weill Cornell Medical College to reduce the time it takes to complete research projects and to deploy new systems and software that will effectively manage and analyze research and instrument data. For example, CAC is collaborating with the College of Agriculture and Life Sciences to generate scientific "data mashups"—combinations of data, such as soil and temperature data that help farmers decide how much nitrogen their crops need. As a rapid technology adopter, CAC is Cornell's gateway to TeraGrid, the nation's largest distributed computing and data storage system. CAC is also collaborating with over a dozen New York State universities to develop a statewide computing grid called NYSGrid. CAC's new director is David Lifka.



> www.cac.cornell.edu

CCIM ↓

In June 2000 the Weill Cornell Medical College's Center for Complementary and Integrative Medicine (CCIM) was established as a universitywide center by the Cornell Board of Trustees. The center is designed to initiate, develop, and expand clinical and basic research and provide professional and patient education in complementary and integrative therapies. CCIM focuses on two key areas: mind-body interventions and natural products such as herbal and botanical medicines. Drawing on collaborations with world-class faculty from many disciplines, departments, and colleges at the New York, Ithaca, and Westchester campuses of Cornell, the center uses innovative methodologies to rigorously evaluate complex mind-body interventions and complex herbal preparations.

Since its inception, the center has received funding for clinical research and education totaling over \$29 million. Among these grants is a fellowship award funded by the National Center for Complementary and Alternative Medicine and an NHLBI Translational Behavior Science award for \$10 million to conduct three parallel clinical trials.



> www.med.cornell.edu/ccim

CNF ↓

The Cornell campus buzzed with close to 400 participants at the 30th anniversary celebration of the Cornell NanoScale Science and Technology Facility (CNF) in June 2007. Topics included drug delivery, ethics, and even science fiction. Scientists from all over the country and world gathered to hear expert speakers participate in technical sessions and attend the research poster presentations at day's end.

The anniversary symposium, The Future of Nanotechnology, kicked off with reflections from Edward D. Wolf, professor emeritus of electrical and computer engineering and CNF director from 1978 to 1988. Lawrence Goldberg, senior engineering adviser of NSF's Division of Electrical and Communications Systems, called CNF a "vibrant enterprise" that has surpassed its founding concept and evolved into a world leader in nanoscience and nanofabrication. "The National Science Foundation is very proud to have played a continuing role in that success," said Goldberg, who oversees the National Nanotechnology Infrastructure Network, a 13-member consortium, including Cornell, of nanoscience-focused institutions.



> www.cnf.cornell.edu

Jack Freed, director of ACERT

CAC Illustration

Mary Charlison, executive director, CCIM, WCMC

Sheila Jasanoff, professor of Science and Technology studies, Harvard University

ICB ↓

The Institute for Computational Biomedicine (ICB) is an independent academic unit established to foster research, education, and infrastructure development in bioinformatics and computational biology of biomedical systems. Research supported by the ICB ranges from computational analysis in disease-related genomics to simulation of molecular mechanisms in cancer, and from mathematical modeling of information coding in the nervous system to simulations of cardiac function and dysfunction. The ICB engages in collaborative research projects with Cornell investigators at WCMC and Cornell-Ithaca. Recent examples include allosteric mechanisms that drive signal transduction in the cell (Harel Weinstein, ICB; Harold Scheraga, Chemistry and Chemical Biology; and Holger Sondermann, Molecular Medicine) and collaboration on theoretical models of the regulation of the heart by the sympathetic nervous system and novel electrical therapies for cardiac arrhythmias (Colleen Clancy and David Christini, ICB, and Robert Gilmour, Biomedical Sciences). The ICB has a broad agenda of consulting and

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education for all levels of researchers from graduate students and postdocs to senior investigators. ICB faculty Luce Skrabanek, Jonathan Victor, and Harel Weinstein are educating and mentoring graduate students from Ithaca on various thesis projects. To support research projects and educational activities, the ICB also develops and maintains a growing bioinformatics infrastructure, for example, an open-source search engine optimized for searching biomedical text collections (<http://twease.org/medline/app>) developed by Fabien Campagne and offers access to shared resources worldwide.

LCRC ↓

The Lehman Brothers Lung Cancer Research Center of Weill Cornell Medical College (WCMC) in New York City—supported by a \$6 million gift from The Lehman Brothers Foundation—is a core component of WCMC's recently established Lung Cancer Research Institute. One of the Center's primary goals is to research new and innovative targeted drug therapies and immunotherapies (vaccinations) for the treatment of lung cancer.

Two unique international clinical trials, now underway, hold the promise of prolonging survival in patients with early lung cancer following surgical removal of their tumor: a targeted oral drug therapy, Tarceva, and a novel vaccine known as MAGE-3.

The center is also testing several drugs, to be administered before surgery is performed, for earlier stage lung cancers. These include the once-a-day pill, Tarceva, and a drug used to inhibit angiogenesis, or the growth of blood vessels to the tumor. Nasser K. Altorki, world-renowned lung-cancer clinician-scientist, chief of the Division of Thoracic Surgery, and professor of cardiothoracic surgery at WCMC, directs the center, which will be officially dedicated in its new space in early 2008.

NBTC ↓

The Nanobiotechnology Center held its eighth annual symposium at Cornell in early October 2007. The meeting's themes included the role of nanobiotechnology research in economic development, advancing biomedical science, and improving medical imaging, diagnostics, and therapeutics. Speakers included Edward Reinfurt, acting executive director of NYSTAR, and Jack Henion, chief scientific officer and chairman of Advion Biosciences. The international breadth of nanobiotechnology research was highlighted with presentations by Brian MacCraith, director of the Biomedical Diagnostics Institute at Dublin City University, and Yosi Shacham-Diamand from Tel-Aviv University. Philip Leopold's presentation on Viruses as Mentors for Nanoscale Drug Delivery illustrated the potential impact of nanobiotechnology in medicine. With over 200 attendees and 70 posters, the symposium demonstrated the increasing interest of the research community as the NBTC develops long-term plans for nanobiotechnology at Cornell.



> icb.med.cornell.edu



> www.nbtc.cornell.edu

Harel Weinstein, director of ICB, WCMC

Nasser Altorki, director of the Lehman Brothers Lung Cancer Research Center, WCMC

(back row, l. to r.) Claudia Fischbach-Teschl, Brian MacCraith, Philip Leopold, Wolfhard Almers, Manfred Lindau, Larry Walker

(front row, l. to r.) Watt Webb, Kimberly Jones, Dan Luo