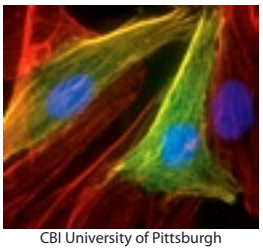
MBIC — A New Age of Discoveries



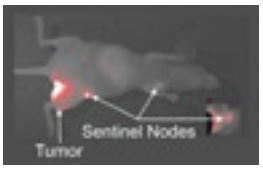
CBI University of Pittsburgh

Networks and Pathways Center

Carnegie Mellon University — University of Pittsburgh — Stanford University — University of California, Berkeley

A National Institutes of Health Technology Center

http://www.mbic.cmu.edu/networksandpathways/



Quantum Dot In Vivo Imaging Program

National Institutes of Health and Invitrogen

http://www.cmu.edu/cmnews/extra/040315_crystalclear.html

Life Detection in Extreme Environments Program

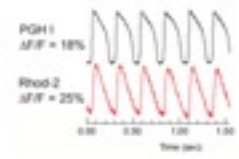
National Aeronautics and Space Administration — Carnegie Mellon University Robotics — Ames Research Center

http://www.frc.ri.cmu.edu/atacama/

Bone Tissues Engineering Collaboration

National Institutes of Health — P. Campbell, L. Weiss, N. Washburn

http://www.btec.cmu.edu/people/faculty/campbell/pcambell.htm



Heart Excitation Imaging Collaboration

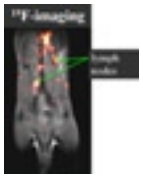
National Institutes of Health — G. Salama, University of Pittsburgh

http://www.cbp.pitt.edu/faculty/salama.html

Biosensor Innovation Collaboration

National Science Foundation — B. Armitage

http://www.chem.cmu.edu/groups/army/



MRI Contrast Agent Collaboration

National Institutes of Health — E. Ahrens

http://www.cmu.edu/bio/contacts/faculty/ahrens.shtml

The Molecular Biosensor and Imaging Center

(MBIC) at Carnegie Mellon University has world-renowned expertise in biochemistry, genetics, dye chemistry and imaging. It has pioneered automated, multicolor fluorescence-imaging technologies that have been adopted by Carl Zeiss Inc., Nikon Inc., Olympus America Inc. and other major imaging microscope manufacturers. The center is also famous for its development of the CyDye™ labeling technologies, which have been widely commercialized and have made a profound impact on biomedical research. Examples include the first fluorescent probes to reveal how nerve cells signal one another and probes used in the Human Genome Project to identify gene activation.

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Director: Alan Waggoner, Ph.D.

History and Funding

MBIC has existed for more than 20 years. Originally the Center for Fluorescence Research (1982), it was renamed the Center for Light Microscope Imaging and Biotechnology in 1991 to reflect its use of fluorescent probe technologies and computerized fluorescence microscopy to study temporal and spatial interactions of living cells. The center was designated a Science and Technology Center by the National Science Foundation (NSF), which supported it for 11 years. At the end of 2002, the center was renamed MBIC. It has since received continuous funding from the National Institutes of Health, NSF, NASA, Pennsylvania Commonwealth Universal Research Enhancement (PA CURE) program and the Keck Foundation.

Multidisciplinary Training

MBIC engages in multi-disciplinary research involving biologists, computer scientists, biophysicists, electrical engineers, synthetic chemists, chemical engineers and biomedical engineers. Since its inception, the center has trained more than 43 graduate students and 34 post docs. These students have gone on to academic and industrial positions with expertise in fluorescence-detection technologies, microscopy, reagent chemistry and biological applications of these powerful tools. Dozens of undergraduates have worked at the center throughout the years on research published in prestigious scientific journals.

Patents and Technology Transfer

Among MBIC's greatest achievements is the successful transfer of its innovative technologies to industry. Center scientists have 63 patents, and the transfer of the cyanine dye technology to Amersham PLC led to the dissemination of these dyes to researchers all over the world. Center scientists have also started several biotechnology companies based on technologies developed at Carnegie Mellon, including, but not limited to:

- Biological Detection Systems Inc., which commercialized fluorescent labels for tagging DNA and antibodies. Acquired in 1995 by Amersham PLC (now GE Healthcare).
- Cellumen Inc., headquartered in Pittsburgh, which is focused on understanding the role genes and proteins play in the life of normal, healthy cells. It's work is key to understanding how proteins malfunction in the disease process.
- Cellomics Inc., which provides high content screening instrumentation and cellular bioinformatics systems to the pharmaceutical industry for faster and more effective drug discovery.