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CONTACT:
Christina DeAngelis
216.368.3635
Christina.DeAngelis@case.edu

Jessica Studeny
216.368.4692
Jessica.Studeny@case.edu

Case Western Reserve University School of Medicine Establishes First Systems Biology and Bioinformatics Graduate (MS and PhD) Program in Ohio

CLEVELAND – May 2 2011 – The Case Western Reserve University School of Medicine is pleased to announce it's established the first PhD and MS program in Systems Biology and Bioinformatics in the State of Ohio. Based in the School of Medicine, with the Center for Proteomics and Bioinformatics as its administrative home, the faculty cohort will include faculty from multiple departments and schools, and the fundamental core competencies for this program will include: genes and proteins; bioinformatics; and quantitative analysis and modeling. The Systems Biology and Bioinformatics graduate program will train researchers to integrate systems biology with bioinformatics to solve complex medical problems and be the biomedical research leaders of the future.

Systems biology represents a new scientific concept of increasing importance to biology and medicine. This new science attempts to understand the integration of individual pieces of biological systems into networks, complexes and the biological organizations critical to cellular and organism functions and development, both normal and in disease. Bioinformatics represents a set of computational approaches to data analysis; the marriage of computational and quantitative thinking in the context of biological integration is a foundational principle of this program.

"Few institutions have the record of innovative educational programs, an existing faculty with balanced expertise and accomplishments in genetic and quantitative biology and medicine and the right combination of biomedical engineering and biomedical computer sciences to propose this program," said Pamela B. Davis, MD, PhD, dean of the School of Medicine. "Case Western Reserve has a well-known culture of collaborative research and a strong commitment from institutional leadership in interdisciplinary programs."

-Case Western Reserve hosted one of the first systems biology conferences (1968) and established in 1969 one of the first inter-school departments (Biomedical Engineering, School of Medicine and School of Engineering).

-The participating departments and schools have built research strength in medicine, genetics, genomics, engineering, epidemiology, biostatistics, and quantitative sciences, with a culture and vision that integration will revolutionize the study of biology and understanding health and disease. This

includes strengthening core programs in cellular imaging, genomics, and proteomics facilities and faculty.

-Over the last several years, the University has expanded its research programs in the diverse areas that provide a foundation for a nationally competitive program in the area of Systems Biology and Bioinformatics.

- The Biomedical Engineering Department and the Radiology Department have invested nearly $15 million in faculty recruitment and advanced imaging facilities that provide enviable research capabilities for exploring molecular, cellular, and organ structure and function at high resolution and in quantitative terms.
- The Genetics department in the School of Medicine has invested several million dollars in bioinformatics and quantitative genetics programs.
- The Biology department has established a Systems Biology undergraduate program and targeted recruitment in faculty with strong quantitative interests, while the Electrical Engineering and Computer Science and Mathematics departments have targeted recruitment in faculty with strong biological interests.
- In 2005, the School of Medicine committed $15 million towards a Proteomics and Bioinformatics Center that has focused on quantitative technologies; faculty recruitments to this program have substantially expanded our capabilities in systems-level biology. This program has leveraged existing programs in Metabolomics, where analysis of small molecule metabolites can provide additional important information in defining and modeling biological systems.
- Lastly, investments in genetic epidemiology and biostatistics have enhanced our ability to connect clinical phenotypes with molecular data and provide an additional basis to developing systems analysis of disease.

These programs and their allied departments have attracted more than $100 million in peer-reviewed funding in terms of both individual grants and large center grants over the last five years. Many of the involved faculty began meeting on a regular basis to enhance collaboration efforts across the University and to begin the process of organizing a training program in Systems Biology and Bioinformatics to facilitate the research and training of students in this discipline.

“An important feature of the training in this program is that all students will be required to combine both experimental and computational or mathematical disciplines in their coursework and in the development and execution of their research plan,” said Mark Chance, PhD, professor of genetics; director, Center for Proteomics & Bioinformatics; and chair of the steering committee for the new program. “This distinguishes the program from other graduate programs, where the course of study and research may be wholly experimental, or graduate programs that may be wholly computational. The students who complete this training will be trained to generate and analyze experimental data for biomedical research and will be also trained to develop physical or computational models of the molecular components that drive the behavior of the biological system.”

Admissions
Students may enter the program through the “umbrella” admissions program of the medical school (the Biomedical Sciences Training Program or BSTP) or through direct admission or through the Medical Sciences Training Program (MSTP). Thus, the program will likely increase overall enrollment in graduate

classes across the campus. For students in the PhD program, the enrollment of the first direct-admit students is planned for fall 2011.

For more information about the program go to http://bioinformatics.case.edu.

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About Case Western Reserve University School of Medicine
Founded in 1843, Case Western Reserve University School of Medicine is the largest medical research institution in Ohio and is among the nation's top medical schools for research funding from the National Institutes of Health. The School of Medicine is recognized throughout the international medical community for outstanding achievements in teaching. The School's innovative and pioneering Western Reserve2 curriculum interweaves four themes--research and scholarship, clinical mastery, leadership, and civic professionalism--to prepare students for the practice of evidence-based medicine in the rapidly changing health care environment of the 21st century. Nine Nobel Laureates have been affiliated with the school of medicine.

Annually, the School of Medicine trains more than 800 MD and MD/PhD students and ranks in the top 25 among U.S. research-oriented medical schools as designated by *U.S. News &World Report* "Guide to Graduate Education."

The School of Medicine's primary affiliate is University Hospitals Case Medical Center and is additionally affiliated with MetroHealth Medical Center, the Louis Stokes Cleveland Department of Veterans Affairs Medical Center, and the Cleveland Clinic, with which it established the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University in 2002. http://casemed.case.edu.