

# Department of Biomedical Engineering



## ***Graduate Program in Biomedical Engineering***

Thank you for interest in research and education opportunities in Biomedical Engineering here at Stony Brook. Our program provides students with a tremendous range of bioengineering challenges, from the design of molecular-based biosensors to high-resolution functional imaging of the brain, and offers the opportunity to work in world-class labs here at Stony Brook University, Brookhaven National Laboratory, or Cold Spring Harbor Laboratory. We emphasize an interdisciplinary bioengineering approach to the complex problems facing medicine in the genomics age, and our curriculum provides the strong foundation necessary for undertaking advanced basic, applied, and translational research in this diverse but interconnected field.

Biomedical Engineering is at the forefront of medicine in the 21<sup>st</sup> century, and the burgeoning success of our discipline has raised expectations for earlier diagnosis and more effective treatment of disease. Faculty at Stony Brook are active contributors to the cutting edge of such targeted science and technology, with internationally acclaimed strengths in Biomechanics, Biomaterials, Biotechnology, Cell, Molecular, and Tissue Engineering, Biosensors, Bio-systems Modeling, Bioinstrumentation, Bioinformatics, and Medical Imaging. These engineering disciplines thrive through active interdisciplinary collaborations between faculty, and have helped distinguish Stony Brook as an outstanding resource for education and research in the health sciences. Harnessing these intellectual and physical resources, our academic program, in Biomedical Engineering provides a rigorous, interdisciplinary education and research environment for our students.

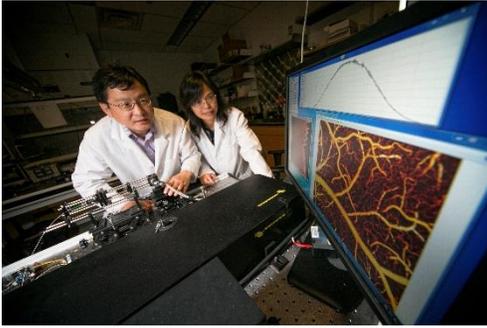


This is an extremely exciting time for Biomedical Engineering. New areas of research and development are opening daily, from nano-based engineering of tissues, to stem-cell therapy, to single-cell genomics for cancer diagnostics. It is an excellent time to pursue your studies here at Stony Brook. Indeed, I am confident that you will find Stony Brook a superb foundation for your future in Biomedical Engineering, whether in academia, the ever-expanding biosciences industry, law, medicine, or government. Our faculty is diverse, our commitment is high, our research is cutting-edge, and our facilities are unique. Come and join us. I welcome you to visit us here on campus, as well as through our website at [www.bme.stonybrook.edu](http://www.bme.stonybrook.edu), to learn more about the opportunities here at Stony Brook University. If there are any questions that I, or one of my colleagues, might address, please do not hesitate to contact us directly.

Yours truly,

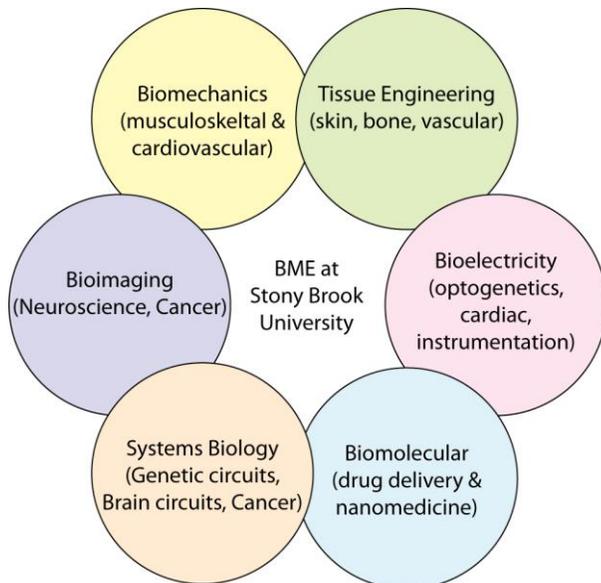
A handwritten signature in blue ink, appearing to read "C.T. Rubin".

Clinton T. Rubin, Ph.D.  
Distinguished Professor and Chair



## Program Description

The Graduate Program in Biomedical Engineering trains individuals with baccalaureate degrees in engineering, applied mathematics and the sciences to provide them with the synthesis, design and analysis skills necessary to contribute effectively to the advancement of science and technology in health and medical care. Programs are offered at the Master's (M.S.) and Doctoral (Ph.D.) levels, providing two distinct avenues of graduate study in biomedical engineering (BME): the doctoral level directed toward the student interested in a research or academic career and the master's level for those primarily interested in the application of biomedical engineering concepts in the development of advanced technology in biomedical products and processes. In both programs, students are educated and mentored in the engineering, biological, medical, and business concepts critical to success in the biomedical research and development environment.



The goal of the program is to provide breadth of understanding of the biomedical engineering overall, and depth within one's chosen field. We implemented

this by requiring all BME students to take a series of core courses and then choosing a number of technical electives that are aligned with the student's special interest. The heart of any graduate program is the research opportunities available to its students. At Stony Brook, students can choose from more than 50 faculty with active research laboratories in the BME graduate program, including nearby Brookhaven National Labs and Cold Spring Harbor. The main research areas of the core Biomedical Engineering Department at Stony Brook are:

- Biomechanics (Rubin, Qin, Judex, Bluestein, Frame, Yin, Chan)
- Tissue Engineering (Clark, Sitharaman, Rubenstein)
- Bioimaging (Vaska, Pan, Du, Mujica-Parodi, Jia)
- Bioelectricity (Entcheva, Lin, Vaska)
- Biomolecular (Sitharaman, Chan, Strey)
- Systems Biology (Balazi, Brouzes, Strey).

Despite its youth, the Department of Biomedical Engineering is performing well. According to the National Research Council, and Academic Analytics, we are ranked in the top 10% of the country. We have a strong funding record from diverse granting agencies, including the National Institutes of Health, National Aeronautics and Space Administration, American Heart Association, National Science Foundation, National Space Biomedical Research Institute, US Army, Office of Naval Research, Whitaker Foundation, Coulter Foundation, National Osteoporosis Foundation, New York Science, Technology and Academic Research (NYSTAR), and private industry. The annual research expenditures for the Department of Biomedical Engineering have reached \$8M, and for the past four years BME has been the best-funded department in the engineering school at Stony Brook University and amongst the best in the University.