



Briefing for Rutgers Senate
Subcommittees

Executive Summary

Mission: The Graduate School of Biomedical Sciences (GSBS) is dedicated to developing scientists who will contribute new knowledge in the biomedical disciplines through creative research and scholarship. To accomplish its mission, GSBS provides:

- ❖ an academic environment that fosters creative thinking, acquisition of pertinent scientific information and knowledge of contemporary methodologies of scientific inquiry;
- ❖ academic programs in the biomedical sciences that prepare students to carry out independent and multidisciplinary biomedical research;
- ❖ instruction in ethical values related to the proper conduct of human, animal and environmental studies and the integrity of scientific research and communication; and
- ❖ experiences in pedagogy to facilitate scientific communications and instruction.

Description: The Graduate School of Biomedical Sciences (GSBS) was founded in 1969 to provide graduate training in the basic biomedical science disciplines. It was first established on the Newark campus of the former UMDNJ and was subsequently expanded to campuses in Piscataway/New Brunswick and Stratford. On July 1, 2013, as a result of the *New Jersey Medical and Health Sciences Education Restructuring Act*, two of the three campuses of GSBS (New Brunswick/Piscataway and Newark) joined Rutgers, the State University of New Jersey as part of Rutgers Biomedical and Health Sciences, while the Stratford campus (associated with the School of Osteopathic Medicine) joined Rowan University.

GSBS offers educational programs leading to the Ph.D., M.S. and M.B.S. degrees and post baccalaureate certificates. Dual MD/PhD, DMD/PhD, PharmD/PhD, MS/MBA, MS/MPH and MBS/MPH programs are also available. The curriculum includes programs in Biochemistry & Molecular Biology, Cell Biology & Molecular Medicine, Microbiology & Molecular Genetics, Molecular Pathology & Immunology, Pharmacology & Physiology, Stem Cell Biology, Integrative Neuroscience, Biomedical Engineering, Exposure Assessment, Cell and Molecular Biology, Molecular Genetics, and Toxicology.

The GSBS Molecular Biosciences program on the Piscataway campus is offered as a joint program with Rutgers Graduate School New Brunswick (GSNB), and the MD/PhD program is offered jointly with RWJMS, GSNB and Princeton University. Several courses are taught in collaboration with the New Jersey Institute of Technology on the Rutgers Health Sciences Campus at Newark

GSBS School Structure

The Graduate School of Biomedical Sciences (GSBS) is unique among the schools of RBHS. Currently, all of the full-time faculty of GSBS have their primary appointments in one of the two Rutgers medical schools (NJMS, RWJMS) or the dental school (RSDM), and utilize space and classrooms within those schools. The value of this relationship is reciprocal; GSBS benefits from the faculty and facilities of the professional schools,

while the professional schools benefit from the GSBS students that are critical members of their research laboratories. GSBS also draws on faculty from Rutgers GSNB and NJIT and has granted adjunct faculty status to qualified individuals from the local pharmaceutical and biotechnology industry.

GSBS educational programs are offered on the RBHS campuses in Newark and New Brunswick/Piscataway. While each division brings to its programs a unique perspective based on the specific research strengths of its collaborating medical/dental school, the goals and objectives that underlie and enable our commitment to the highest academic and ethical standards, to the most comprehensive training programs, and to the career aspirations of our students are shared by all. We are committed to:

- ❖ Provide an educational environment with multidisciplinary opportunities for scientific learning, research and collaboration
- ❖ Provide a foundation of basic knowledge in broad scientific fields
- ❖ Impart detailed knowledge of specific scientific fields pertinent to the student's long-term objectives
- ❖ Train students in the scientific method, where they critically evaluate data, formulate logical hypotheses and design and execute studies necessary to test these hypotheses.
- ❖ Teach and enforce the ethical conduct of research
- ❖ Offer programs in oral and written presentation/communication
- ❖ Provide financial support for graduate student research training
- ❖ Provide an environment that supports social interactions and encourages work/life balance
- ❖ Provide an environment that establishes, encourages and supports diversity
- ❖ Provide financial and training opportunities for underrepresented minorities to enter the field of science and to increase the overall diversity of the biomedical workforce
- ❖ Develop new programs and degrees which reflect the changing scientific, biomedical and economic climate
- ❖ Foster and continue to grow outreach programs that interact with local high schools, colleges and other community groups
- ❖ Continue to develop strong ties with local industry that will lead to the establishment of additional training programs focused on NJ workforce needs
- ❖ Guide students in career choices and job placement
- ❖ Establish strategic global partnerships that enhance our educational environment and enrich the training opportunities for our students
- ❖ Maintain a strong alumni society that will foster continued relationships with Rutgers GSBS and access to New Jersey-based networking/career opportunities

Administration/Governance:

The Dean of GSBS is the chief academic and administrative officer with primary responsibility for implementing the mission of the school. The Dean reports to the Chancellor of Rutgers Biomedical and Health Sciences.

Each of the GSBS campuses has a Senior Associate Dean (SAD) who has general

oversight of the GSBS affairs for the division and reports to the Dean of the GSBS with regard to academic and budgetary matters. Each SAD also acts as a liaison to the Dean of the campus medical/dental school with regard to administrative matters under the purview of that Dean, and represents the GSBS with regard to campus-specific issues. The SADs receive input from the GSBS Executive Council on each.

Affiliations – In addition to its integral relationship with the RBHS medical and dental schools and other New Jersey academic institutions, the GSBS has developed a strong formal relationship with the University of Puerto Rico, Mayaguez (UPR). Since integrating with Rutgers University, GSBS has been proactive in formalizing ties with select universities around the world; current efforts are focused on Korea, Indonesia, Brazil and India. GSBS has also established strong relationships with New Jersey industry. The GSBS part-time teaching faculty include members of the pharmaceutical and biotechnology companies.

Strengths and Major Accomplishments:

- Extramural biomedical research expenditures at the legacy schools of RBHS exceeded \$230M and federal research expenditures exceeded \$124M according to the most recently published NSF data (FY2011), and most of the funded investigators are members of the GSBS faculty.
- GSBS graduate students are an intrinsic part of the research mission of the medical and dental schools, playing important roles in the conduct and development of funded research programs.
- GSBS is the recipient of many local, State and national grants that support the training of graduate scientists, including highly competitive National Institutes of Health (NIH) grants from the Division of Minority Opportunities in Research and other NIH institutes.
- Many of our students are also awarded individual fellowships from the NIH and other sources to support their education and research, bringing additional critical resources to the State.
- Our students have published in the most prestigious research journals, including Cell, Science, Nature and the Proceedings of the National Academy of Sciences.
- GSBS graduates go on to obtain positions in academia, government and the pharmaceutical/ biotech industry. Many remain in the State after graduation, where they help meet critical workforce needs in the biomedical/healthcare arena.
- Doctoral programs of GSBS are structured as multidisciplinary tracks to facilitate collaborative translational research and training.
- In recent years, two unique programs, the M.S. in Molecular Pathology and Immunology and the M.S. in Clinical and Translational Sciences, were developed in partnership and in consultation with collaborators from the biotechnology and pharmaceutical industry to fulfill workforce needs in the State.
- New medical and dental scholars' programs have been developed to serve as a pipeline for Master's students interested in continuing their education in medical or dental school.
- Graduate degree programs can be supplemented with vocationally-targeted

concentrations in Biodefense, Neuroscience, Stem Cell Biology, Pharmacological Sciences and Oral Biology. A concentration in Computational Imaging and Biopharmaceutical Sciences, a collaboration with Rutgers School of Arts and Sciences, and an Anatomy Teaching Certificate have been developed. New concentrations and certificate programs are under development.

- Strong community outreach programs exist across GSBS to teach science and research techniques to local high school and community college students; some of our programs have been recognized at the national level. For example, GSBS participates in state and national educational programs for high school and undergraduate students, including the New Jersey Science Olympiad, the national Brain Bee (the winner of the UMDNJ 2010 regional competition received second place honors at the national competition) and the NJ SEEDS program to prepare academically talented, financially limited youth for success at competitive schools.