

ABSTRACT: 2013 ELAM Institutional Action Project Poster Symposium

Project Title: Development of a PhD Program in Translational Biomedical Sciences

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Collaborators: Jessica M. Jones, PhD (DGS, Biochemistry and Molecular Biology); Anna T. Riegel, PhD (Director of Cancer Research Education); Pharmacology); Jason G. Umans, MD, PhD (Director of M.S. in Clinical and Translational Research, Georgetown Howard Universities Center for Clinical and Translational Science); Barry B. Wolfe, PhD (Director of Graduate Studies (DGS); Jean R. Wrathall, PhD (Director, T32 Training Program in Neural Injury and Plasticity)

Background, Challenge or Opportunity:

To accelerate the occurrence of medical breakthroughs that markedly improve human health, there is a critical need to increase the number of individuals conducting rigorous translational biomedical research. Translational research requires medical knowledge and an understanding of clinical research. Due to increasing economic burdens and time constraints placed on physicians these days, the number of physician scientists conducting translational research is diminishing. While PhDs have the ability to also conduct translational research, most PhDs do not receive medically-oriented course work or engage in a mentored clinical experience and accordingly, few PhDs work closely with physicians and physician scientists or otherwise engage in translational biomedical research.

Purpose/Objectives: To establish a new PhD Program in Translational Biomedical Sciences (TBS) that trains PhD students in the skills necessary to not only conduct but to drive the translational research field.

Methods/Approach:

A TBS Advisory Committee was formed (see above collaborators) to develop a TBS track that is offered within each of the existing PhD programs in the basic sciences. The committee developed a curriculum that dove tails to the existing PhD program curriculums and identified clinical-basic science mentorship pairs. The support of key medical center stakeholders was sought including the current Directors of Graduate Studies in the Basic Sciences, Chairs of the Basic Science departments, the leadership and members of the Medical Center Graduate Advisory Committee, the Medical Center Senior Associate Dean for Graduate Education, the Principal Investigators of the Georgetown Howard Universities Center for Translational Research, the Division Chiefs in the Clinical Departments, the Clinical Chairs, the Medical Center Dean for Research, and the Executive Vice President for Health Sciences and Executive Dean of the School of Medicine. In addition, support from the Dean of the Graduate School and the University Executive Committee of Graduate Education has been sought. The next step is to make incoming PhD students aware this summer of the existence of this new track, to encourage them to apply and to enroll a fraction of these students into the program.

Outcomes and Evaluation:

Initial metrics include student enrollment in the new translational biomedical research track to be offered to the 2013 matriculating class of PhD candidates through our existing PhD graduate programs in Biochemistry and Molecular Biology, Cell Biology, the Interdisciplinary Program in Neuroscience, Oncology and Pharmacology. Additional metrics include approval by the Graduate School, President and University Board to establish a new PhD program in Translational Biomedical Sciences and subsequent funding of a T32 training grant application to support this new program. Long term metrics will include the ratio of applicants to positions offered, PhD candidate publications and predoctoral grant support, student and faculty program evaluations, and ultimately, the career success of our PhD graduates.

Establish a Transdisciplinary PhD Track in Translational Biomedical Sciences

Kathryn Sandberg, PhD

ELAM Scholar Class of 2013, Georgetown University

Mission

Prepare PhD students to become a critical link between basic science and medicine in academia, government, and industry that serves to advance the translation of basic science into improved outcomes for health, aging and disease.

Vision

PhD scientists trained in translational biomedical sciences will accelerate the translation of basic research into improved outcomes for health, aging and disease.

Objectives

Train PhD student in how to:

- ✓ Engage physicians in collaborations with basic scientists to define the biological effects of disease pathogenesis and therapeutics in humans
- ✓ Conduct investigations that provide a biological foundation for the development of improved therapies
- ✓ Lead research at the interface between basic science and medicine

Strategy: Courses



Core

- ✦ Physiology and Pathophysiology
- ✦ Research Ethics with Human Subjects
- ✦ Study and Clinical Trial Design
- ✦ Biostatistics in Clinical Research
- ✦ Effective Speaking, Writing & Critiquing
- ✦ Principles of Team Science & Leadership
- ✦ Rotation on the Scientific Evaluation and Prioritization Committee
- ✦ Rotation on the Institutional Review Board

Individualized

Core courses in basic science discipline

Example of Individualized Core Courses		
PhD Program	YR1	YR2
Biochem & Mol Biol	Biochemical and Cellular Sciences I & II Modern Methods in Molecular Biology Biochemistry, in Depth Molecular Cell, in Depth	Metabolism, Signaling and Nutrition

Strategy: Clinical Experience

Core

- ✦ Mentored rotation on Clinical Research Unit Community Advisory Committee (2 mtgs)

Individualized (choose 2)

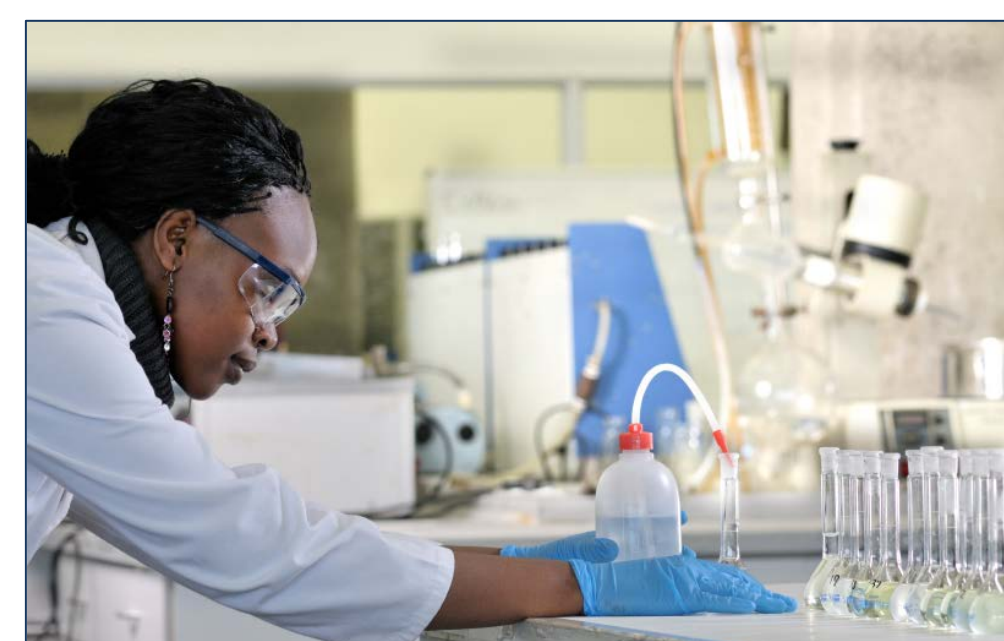
- ✦ Specialty-based clinic (6 clinic visits)
- ✦ Community-based clinics (6 clinic visits)
- ✦ Hospital rounds (daily, 2 wks)
- ✦ Consult service (daily, 2 wks)



Example of Individualized Clinical Experience

PhD Program	Specialty-based Clinic	Consult Service
Biochem & Mol Biol	Hypertension	Nephrology

Strategy: Research



- ✦ Thesis project includes involvement of human subjects
- ✦ Dual mentorship in basic science and clinical medicine
- ✦ Submission of a predoctoral fellowship application

Example of Individualized Research with Dual Mentorship

Basic Scientist	Clinician Scientist	Project
Kathryn Sandberg, PhD	Jason Umans, MD, PhD	Immune modulation of hypertension in women with ovarian hormone deficiency

Strategy: Journal Clubs

Core

- ✦ TBS Student Journal Club

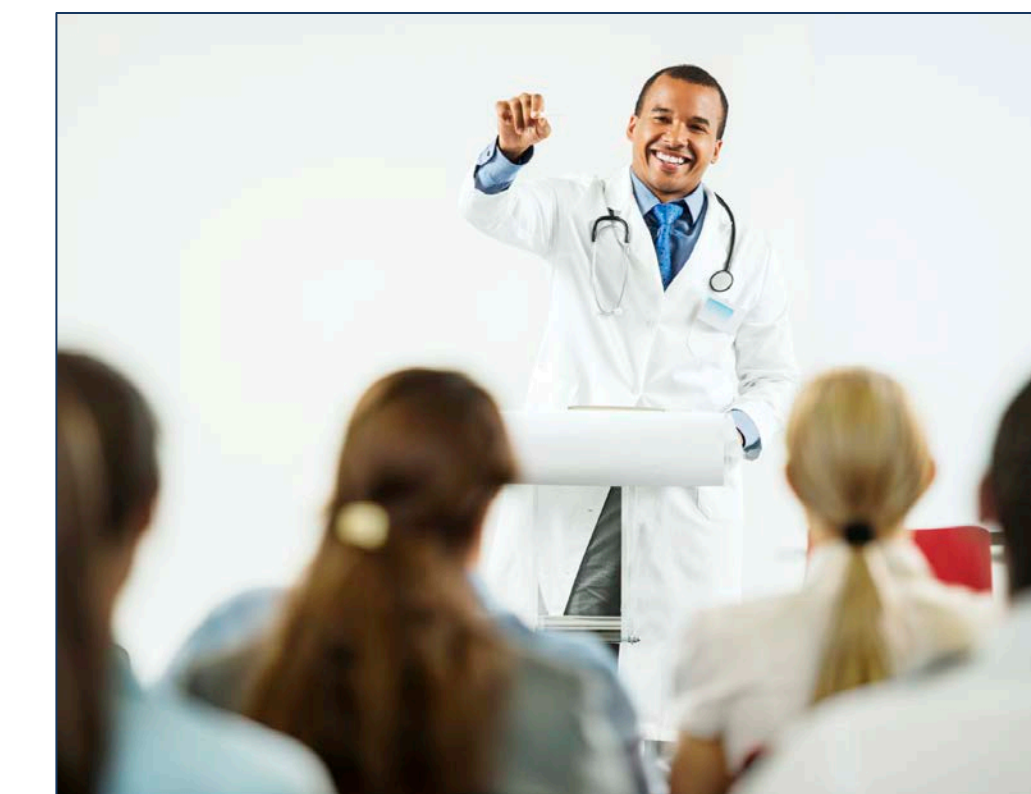
Individualized

- ✦ PhD Program Journal Club
- ✦ Clinical Journal Club in relevant discipline

Example of Individualized Journal Clubs

PhD Program	PhD Program Journal Club	Clinical Journal Club
Biochem & Mol Biol	Biochem & Mol Biol	Nephrology & Hypertension

Strategy: Seminars



Core

- ✦ Oak Ridge National Lab Translational Science series (web-based)
- ✦ Seminars in Clinical Research
- ✦ Windows into Translation (joint seminars by a basic scientist & clinical investigator)
- ✦ TBS Student Research
- ✦ Career Path Choices (speakers from academia, government and industry)

Individualized

- ✦ Seminars in basic science discipline
- ✦ Grand Rounds in clinically relevant discipline

Example of Individualized Seminars

PhD Program	Seminar Series in Basic Science Discipline	Grand Rounds
Biochem & Mol Biol	Biochem, Mol & Cell Biology Department seminar series	Medicine

Program Metrics and Outcomes

Short-term

- ✓ Students demonstrate education competencies in research design and data analysis, writing and oral skills, networking, negotiation, teamwork and leadership
- ✓ Students publish with clinical faculty
- ✓ Students serve as nexus for new and expanded collaborations between basic scientists and clinicians
- ✓ Graduates pursue postdoctoral positions in medically-relevant fields
- ✓ Students obtain extramural funding
- ✓ Applicant pool increases in size and quality

Long-term

- ✓ Collaborations between basic scientists and clinicians result in grants, contracts and patents
- ✓ Extramural funding for the program is obtained
- ✓ Extramural funding is sustained by grants, gifts and donations and leveraged support from Georgetown University Hospital and our Clinical and Translational Science Center
- ✓ Graduates land lynch pin positions at the interface of basic science and medicine in academia, government, or industry