



Task Force on Synergizing Research & Graduate Education

July - August 2023

Background

Charge & Scope

The task force was charged to look inward at the research strengths at HSC and envision opportunities to synergize graduate education to these research strengths in a more effective manner. The following questions guided task force discussion and exploration.

1. How do our graduate programs compare to aspirational peers?
2. Where have most of our PhD students been trained (e.g., labs/centers/institutes)?
3. What changes will improve our integration of students into HSC research strengths?
4. Are new degrees (M.S., PhD) recommended based on our strengths and industry needs?

The task force focused only on PhD education.

Task Force Members

Robert McClain (Co-Chair) – HSC Next

Michael Coble - CHI/SBS

Kyle Emmitte - SCP

Emily Spence - SPH

Jimmy Renfro – Career Readiness Center

Rebecca Cunningham (Co-Chair) - SCP

Kimberly Fulda – TCOM/NorTex

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Melissa Petersen – TCOM/ITR

Teresa Wagner – SHP/SaferCare

Findings & Data

HSC Student Background

- Nearly half of current PhD students at HSC are from Texas (Figure 1). Another quarter are US students from outside Texas, mostly from southern states (LA, FL, NC, OK).
- The majority of current PhD students come to HSC from the UNT System (30%).
- Most HSC PhD students have undergraduate degrees in a basic science (Figure 2.)
- HSC PhD students mainly train in individual department labs or facilities (79%) and not at a center or institute. A few students train within NTERI.

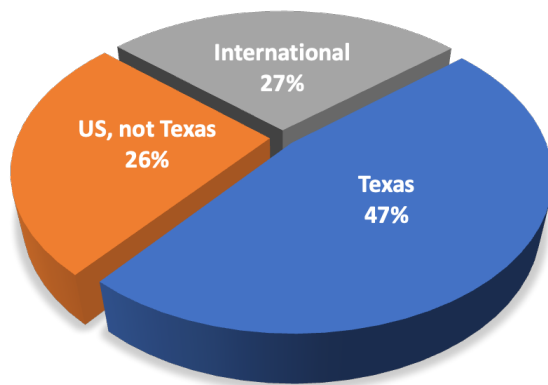


Figure 1

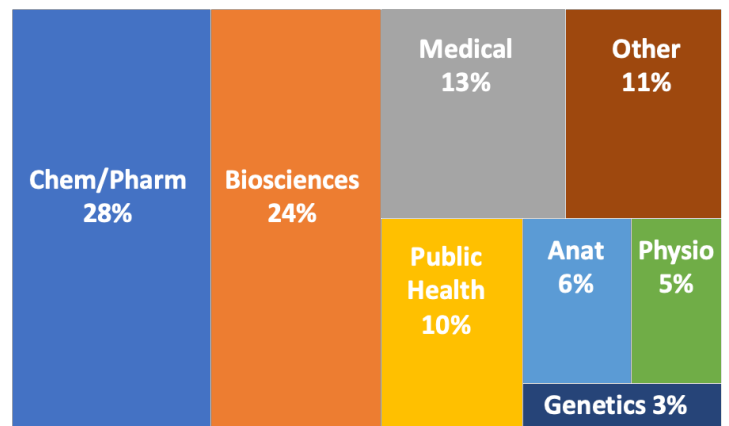
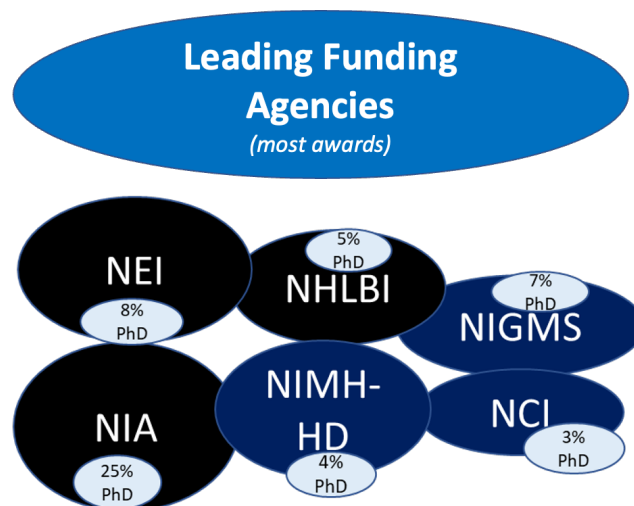


Figure 2

Research Strengths

- Sponsored research awards from the past five years were analyzed by key words and funding source. The following research areas were identified as HSC research strengths. This same pattern was identified for PhD student fellowships at HSC.
 - Aging
 - Health Disparities
 - Visual Sciences
 - Cardiovascular & Metabolic
 - Neuroscience
 - Community Engagement
 - Drug Discovery & Development
 - Anatomy



HSC Programs Relative to Peer Institutions

- HSC has two PhD programs: Biomedical Sciences and Public Health. Within those two programs, ten disciplines are offered. Pharmacology & Neuroscience, Integrative Physiology, Biochemistry and Cancer Biology are the disciplines with the most students.
- Over the past five years, Structural Anatomy, Pharmaceutical Sciences & Pharmacotherapy, and Visual Sciences are the disciplines with the most growth.
- HSC competes for PhD students with seven other peer institutions in Texas: four UT System schools in Dallas, San Antonio, Houston and Galveston; Baylor College of Medicine; Texas A&M Health Science Center; Texas Tech Health Science Center.
- The median number of doctoral programs offered by Texas peer institutions is six.

Doctoral Programs Offered by Peer Institutions within Texas

Doctoral Program	Peer Total	HSC	UTHSC Houston	UTMB	Baylor COM	UTHSC San Antonio	TAMU HSC	UTSW	TTHSC
Total Doctoral Programs Offered		2	18	6	6	6	5	4	3
Biomedical Sciences	8	✓	✓			✓	✓	✓	✓
Biomedical Engineering/Physics/comp bio	8		✓		✓	✓		✓	
Microbiology & Immunology	7		✓	✓	✓	✓		✓	
Nursing Science	7		✓	✓		✓			
Biochemistry	7		✓	✓		✓			
Neuroscience	7		✓	✓	✓				
Pharmaceutical Sciences, Drug Design, Tox	6			✓			✓		✓
Pathology	5		✓	✓			✓		
Public Health	5	✓	✓				✓		
Anatomy/Rehabilitation Sciences	5								✓
Cell and Molecular Biology	5		✓			✓			
Pharmacology/Physiology	5		✓						
Behavioral Sciences/clinical psych	5		✓				✓	✓	
Epidemiology	4		✓		✓				
Bioinformatics/medical infomatics	2		✓						
Biostatistics	2		✓						
Cancer	2		✓		✓				
Developmental Biology	2		✓		✓				
Genetics	1		✓						
Virology	1		✓						

- Hanover identified seven HSC peer institutions outside Texas.
 - LSU HSC - Shreveport
 - Medical Univ. of South Carolina
 - Oklahoma University HSC
 - St. Louis University
 - University of Tennessee HSC
 - Tulane School of Medicine
 - SUNY Downstate Health Sciences University
- The median number of doctoral programs offered by these peer institutions is five.

Doctoral Programs Offered by Peer Institutions Outside Texas

Doctoral Program	Peer Total	HSC	MUSC	OU HSC	St Louis Univ	U Tenn HSC	LSU Health Shreveport	SUNY Downstate	Tulane SOM
Total Doctoral Programs Offered		2	12	10	8	5	5	4	1
Biomedical Sciences	8	✓		✓		✓			✓
Biomedical Engineering/Physics/comp bio	8		✓		✓	✓		✓	
Microbiology & Immunology	7		✓				✓		
Nursing Science	7		✓	✓	✓	✓			
Biochemistry	7		✓	✓	✓		✓		
Neuroscience	7		✓	✓				✓	
Pharmaceutical Sciences, Drug Design, Tox	6		✓	✓		✓			
Pathology	5		✓		✓				
Public Health	5	✓			✓		✓	✓	
Anatomy/Rehabilitation Sciences	5		✓	✓	✓		✓		
Cell and Molecular Biology	5		✓	✓				✓	
Pharmacology/Physiology	5		✓	✓	✓		✓		
Behavioral Sciences/clinical psych	5				✓	✓			
Epidemiology	4		✓	✓					
Bioinformatics/medical infomatics	2		✓						
Biostatistics	2			✓					
Cancer	2								
Developmental Biology	2								
Genetics	1								
Virology	1								

In the data presented, “Peer Total” is the combined total of programs within that field offered by institutions in and outside of Texas.

Recommendations

Five Ideas for Leveraging HSC Research Strengths to Enhance PhD Education

- A. Create new PhD programs that are focused on interdisciplinary training across HSC.
Illustrative Opportunity: Neuroscience is a research strength manifested in multiple schools and institutes at HSC. The assets and expertise of each could be coordinated to provide a unique educational experience for PhD students.
- B. Convert some existing PhD “disciplines” into stand-alone PhD degrees.
Illustrative Opportunity: Visual Sciences is an example of an SBS discipline that has demonstrated a high level of growth over the past 5 years. In this case, a PhD in Visual Sciences would also be offered by SBS in addition to the PhD in Biomedical Sciences.
- C. Expand IPE training to HSC PhD students.
Illustrative Opportunity: Tapping into HSC resources like SaferCareTX and HSC Health could create contextual training and research opportunities for PhD students whose projects are ultimately connected to improving patient safety, health literacy and/or clinical care, even at the basic science level.
- D. Invest in tangible support to faculty and schools to develop training grant proposals.
Illustrative Opportunity: In FY22, HSC received three NIH training awards, one of which was for Training in the Neurobiology of Aging and Alzheimer's Disease. Pursuing similar awards could support doctoral training activities around other research strengths.
- E. Develop infrastructure for internship opportunities for all PhD students at HSC.
Illustrative Opportunity: Creating short-term internships at locations such as startups, law firms, government sites and community non-profits could help PhD students explore non-academic career paths.

Other Ideas to Enhance PhD Education Arising from Task Force Discussion

- F. Create an institutional teaching core that can be cross-listed by each degree program.
Illustrative Opportunity: Statistics, Responsible Conduct, Pedagogy of Teaching, Grant Writing, Interdisciplinary Seminars, Scientific Communications and potential IPE or internship training are topics common to all PhD programs.
- G. Invest in pursuing the Carnegie Designation for Special Research Focus Schools by increasing enrollment to graduate a minimum of 20 PhD students per year.
Illustrative Opportunity: Relative to last year, HSC is only four PhD graduates short of qualifying.
- H. Dedicate resources to a marketing and communication strategy focused on HSC PhD education.
Illustrative Opportunity: Create a dedicated webpage and social media channels aimed at recruiting students to a PhD education at HSC.