

Academic Program Working Groups Final Report

January 31, 2014

Working Group Name	Biomedical Science
Working Group Co-Chairs	Karen Chandler and Michael Lehker
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Executive Summary

Background

Biomedical Programs can be broadly defined as areas of study which involve the application of the principles of the natural sciences, especially biology, chemistry and physiology to the study of human beings and clinical medicine. This includes the preprofessional programs which prepare students for pre-med, pre-dent and pre-health professions. Most of these programs are transdisciplinary in nature. Biomedical programs will be expected to play a key role in the transformation of the Rio Grande Valley as the Medical School becomes fully operational. New program development in this area is expected to include a variety of programs. The suggested list of new programs only includes a few for 2015 due to the time constraints of new program proposal development. However, as the timeline moves farther out, the need and feasibility for new biomedical programs will increase.

This report will concentrate on the biomedical sciences and the pre-professional programs such as Pre-Med, Pre-Dent, Pre-Pharm, A-Prime Time and the Biomed Program. Clinical Laboratory Science was included in this working group but differs from the other programs in that it is an allied health professional undergraduate program with separate accreditation and certification requirements. Students who graduate in clinical laboratory science are members of the Health Care Practice Team.

A. Background and Introduction

Many paradigm shifts are expected to occur in the coming years. The convergence of new and revolutionary technology in conjunction with changing demographics, rapid scientific advances, as well as social and political values can be expected to reshape access and delivery of education and medicine. Just a few of these drivers are listed below:

- The information revolution (communication and computing)
- Human Genome Project which is leading to personalized, predictive and preventive medical care
- Rapid advances in knowledge and technology --particularly high throughput platforms in molecular biology, nanotechnology, biotechnology and IT
- Ethical, legal and social obligations
- Cultural Competence
- Diversity
- Ageing of society
- Health Care Policy
- Research Support

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B. Knowledge Skills and Attitudes for the 21st Century

Based on the above observations, a partial list of suggested skills, knowledge and attitudes that all graduates should possess has been listed below:

Skills: For the New Biomedical Science/ Health Professional

- high-level cognitive skills: abstract reasoning, critical thinking, problem-solving, communication, and collaboration skills
- ability to utilize life-long learning skills
- ability to communicate effectively in both written and verbal formats
- teamwork skills

C. Enabling Technologies

The New University will demand the use of technology and innovative strategies to prepare graduates across the Rio Grande Valley. Student demand will drive the need for an increase in reduced seat courses, completely online courses and web conference modes of instruction. Courses should be offered in formats which are appropriate for course content and student learning styles.

D. Academic Programs and Support

Many of the programs would be cross disciplinary in nature and close ties with other programs and colleges can be expected. New programs should be developed based upon student demand and the changing needs of the region. A heavy emphasis should be placed upon new graduate programs as well as preparing students for graduate school and professional programs.

Two interdisciplinary centers are proposed. One would be the Center for Biomedical Research. It is envisioned that this center would cross colleges and disciplines and bring researchers together around disease based research clusters. Possible clusters include Cancer Biology, Cardiovascular Disease, Obesity and Diabetes, Infectious diseases, Neuroscience, Developmental Biology and Toxicology and Environmental Health Sciences. The center could include support services such as grant writing, statistical support and grant management.

The second center would be a Center for Health Profession Coordination. There are multiple paths for medical school, dental school, pharmacy and the health professions but right now there is no central point of contact to assist students in their goals or to help students find alternate paths when initial plans do not work out. Basic advising for each degree plan should remain in the department but career planning, application assistance, interview and exam prep resources could be centralized. Students may start out as pre-Med, or Biology but they often don't find out about alternate career choices such as allied health if they are housed in a different College. This center would help in facilitating communication between programs housed in different colleges and perhaps shorten time to degree for students.

D. What academic structure is most appropriate for the biomedical programs? programs?

The proposed structure for the biomedical programs proved to be the most difficult question to address. The consensus was that Clinical Laboratory Science needs to be with the other Health Professions since it is a Health Profession Program and graduates will be expected to be part of interdisciplinary health care teams. Clinical Laboratory Science also teaches a course which is part of the Physician Assistant Program. The discipline also has a track within the newly approved Masters Health Science. Likewise the pre-med biology, pre-med chemistry, pre-pharmacy options etc. within chemistry and biology should remain in those units since they are tracks within a major.

Several models were proposed for the Biomedical Sciences Program and the new Biomedical Programs but no consensus was reached by the group. In Model One, the Biomedical Programs would be housed as a department in a College of Science and Math or some similar entity. It is possible that as programs are added, the department would transition to a

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school or separate college. In model two, it would be a School within the College of Medicine. In Model Three; it would be a separate College. Diagrams for these models are attached.

Working Group Meetings

Date	Location/Format
October 4, 2013	UTPA APWG Kick off meeting, Face to Face
October 17, 2013	Harlingen, Face To Face
November 26, 2013	Videoconference
December 13, 2013	Joint Meeting APWG, Face to Face
January 8, 2014	Videoconference
January 16, 2014	Videoconference
January 17, 2014	Videoconference
January 22, 2014	Teleconference (originally scheduled as videoconference. but bad connection)

Current Academic Programs

UTB	UTPA
Biomedical Sciences-BS	Clinical Laboratory Sciences-BS
Biological Sciences-BS	Masters in Health Science
Biological Sciences-MS	BS Biology, PreMed, PreDental, PreOptometry,
Biological Sciences-MSIS	BS Chemistry, PrePharmacy
BS/BA +MPH (4+1) University of Houston awards MPH	Physician Assistant Program MPAS
Bridge Program to Ph.D. in Biomedical Informatics at U. of Utah	Communication Sciences and Disorders-BS, MS
Nursing-BSN	MSOT
Nursing MSN-online	Dietetics-BS
BAT -online	Nursing-BSN, MSN
	Social Work-BSW, MSSW
	Rehabilitation -BS
	Rehabilitation Counseling-MS, Ph.D.
	Pharm. D-Cooperative with UT-Austin

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Current Academic Programs to be Offered Fall 2015

Bachelor's Degrees	Master's Degrees	Doctoral Degrees
Biomedical Sciences-BS	MS Biology	Pharm D. Cooperative with UT-Austin
Biological Sciences-BS	MS Chemistry	Rehabilitation Counseling-Ph.D.
BS Biology, PreMed, PreDental and Pre Optometry, UTeach	MS Physics	
BS Chemistry , PreMed, UTeach, PrePharm	Masters in Health Science	
BS Physics	Physician's Assistant Studies-MPAS	
BS/BA +MPH (4+1) University of Houston awards MPH	Communication Sciences and Disorders-MS	
BAT -online	Masters in Social Work	
Bridge Program to Ph.D. in Biomedical Informatics at U. of Utah	Masters in Occupation Therapy-MSOT	
BS Environment Sciences, Teach	Rehabilitation Counseling-MS	
BS Clinical Laboratory Sciences		
Social Work-BSW		
Communication Sciences and Disorders-BS		
Nursing-BSN		
Rehabilitation Science BS		
Dietetics-BS		

New Academic Programs for Fall 2015 (Please indicate with an asterisk (*) your top 3 priorities.)

Bachelor's Degrees	Master's Degrees	Doctoral Degrees
Biochemistry*	Biomedical Sciences*	
	Health Economics and Policy*	

New Academic Programs for Fall 2017 (Please indicate with an asterisk (*) your top 3 priorities.)

Bachelor's Degrees	Master's Degrees	Doctoral Degrees
Molecular Cell Biology	Public Health	
Biomedical Engineering	Forensics	
Medical Humanities	Biophysics/Medical Biophysics	
Bioinformatics	Environmental Laboratory Sciences	
Forensic Sciences*	Animal Laboratory Sciences	
Health Information Management	Biotechnology/Molecular Diagnostics	
Biotechnology*	Bioinformatics*	
	Medical Genetics and Genomics	

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New Academic Programs for Fall 2020 (Please indicate with an asterisk (*) your top 3 priorities.)

Bachelor's Degrees	Master's Degrees	Doctoral Degrees
	Biomedical Engineering*	Medical Genetics
	Biophysics/Medical Physics*	
	Human Nutrition	
	Medical Humanities	
	Bioinformatics	
	Computational Health Informatics	
	Translational Bioinformatics and Computing Biotechnology*	

New Academic Programs for Fall 2025 (Please indicate with an asterisk (*) your top 3 priorities.)

Bachelor's Degrees	Master's Degrees	Doctoral Degrees
	Behavioral Health	Ph.D. Translational Science and Research
	Epidemiology and Infectious Disease Studies*	Bioengineering
	Immunology	Bioinformatics
	Microbiology	Medical Physics*
	Pharmacology	Environmental Pharmacology/Toxicology
		Medicinal Chemistry
		Evolutionary Medicine
		Health Information Management
		Public Health
		Biotechnology*

Examples of innovative programs

Identify institutions and/or programs that are organized in an innovative way. In what ways are the programs innovative? How does this organization promote student success and/or scholarly activity?

Research clusters based upon important areas of biomedical research allow for greater collaboration among researchers from different fields. The structure promotes interdisciplinary communication in the investigation of complex research questions. Several Universities appear to use this approach to promoting scholarly activity. The University of North Texas and Marshall University, Joan C. Edwards School of Medicine, Biomedical Sciences Graduate Program use this type of structure. This structure is also used for the Biomedical Sciences, Ph.D. program. In addition, there are several models for 4+1 programs which could be used to shorten the time to the completion of the Master's Degree. The Masters in Public Health Program already exists in a 4+1 format with the UT Health Science Center Houston School of Public Health.

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Possible consultations

Identify campuses that faculty and administrators who are engaged in further planning may wish to study or visit and/or leaders/scholars that planners may wish to consult.

Consultants and /or visits to existing programs would provide a strong structure and curriculum development by not repeating the errors previously experienced by other programs. This is invaluable in the rapid development and aggressive time lines in this proposal. The forensic program would lean heavily on the existing program at the University of North Texas in combination with the real world experience of the DPS Crime lab. The MPH (4+1 and possible standalone) would be firmly rooted in the programs offered by UT-Houston HSC School of Public Health. The Biomedical Engineering program would benefit from visits to UT Austin, Texas A&M and Rice University. Finally the proposed PhD in Translational Sciences and Research would benefit from the NIH Center for Advancing Translational Sciences and the Texas Consortium for Translational Sciences (CTSA). Universities of Colorado and Utah have medical genetics and genomics programs and may serve as models. UTB has an ongoing collaborative program called the bridge to Ph.D. in biomedical informatics with the University of Utah which could serve as consultant to developing a local graduate program. UTHSC-Houston has a master's program in genetic counseling and may also help us develop a program.

Trans-disciplinary Opportunities

Describe the trans-disciplinary opportunities that extend beyond your group of disciplines.

Forensics- Potential involvement from multiple disciplines including clinical laboratory sciences, criminal justice, biology, and chemistry

Biotechnology/Molecular Diagnostics –opportunity to collaborate with clinical laboratory science, biology

Biomedical Engineering- opportunity to collaborate with engineering

Biophysics- potential opportunity to collaborate with physics

Biochemistry- collaboration with chemistry

Human Nutrition- collaboration with dietetics and health

Bioinformatics-opportunity to collaborate with Computer Science

Medical genetics, genomics, genetic counseling-opportunity to collaborate with future medical school

Public Health-opportunity to collaborate with UT Schools of Public Health

Bicultural/ Biliterate/Bilingual

Describe how the proposed academic programs reflect the bicultural/bilingual/biliterate mission of the new university and culture of our region.

The biomedical programs proposed would allow a focus on many of the problems currently identified in this region including obesity and diabetes. In addition there are many epidemiological and infectious disease problems that transcend our borders. The Medical Humanities is anticipated to have a specific focus on bicultural, biliterate and multicultural aspects of science education and health care delivery.

Community Engagement

Describe how the proposed academic programs reflect the community engagement mission of the new university.

Many of the programs would be expected to be involved with community agencies such as the Hidalgo County Health Department and local healthcare organizations.

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Academic Structure

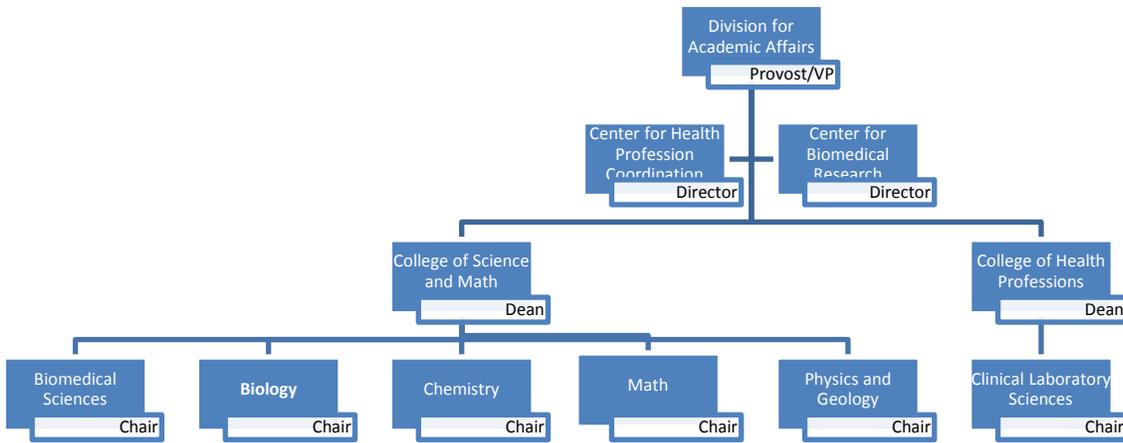
Describe the academic structure you are recommending for your group of disciplines.

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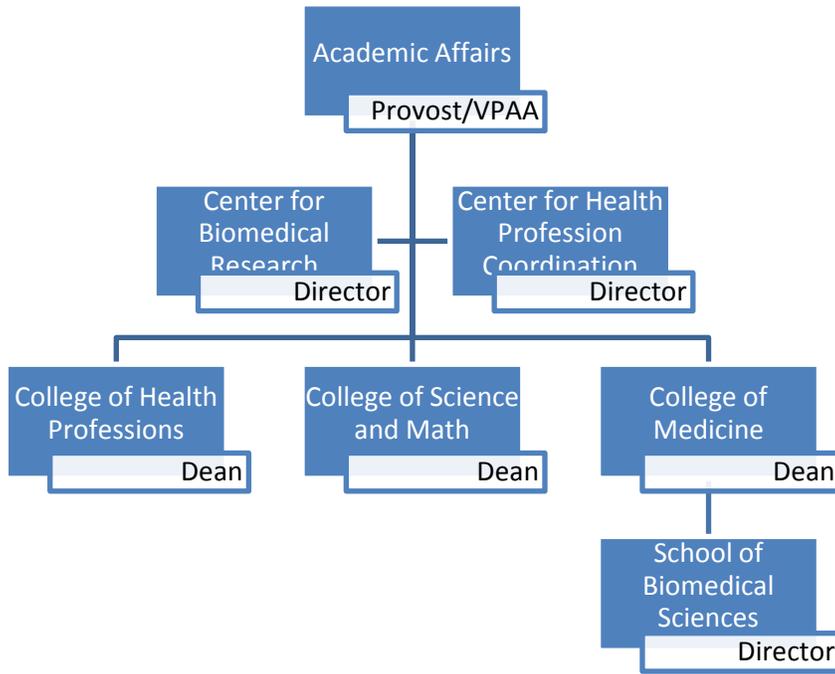
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Model One



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Model Two



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Model Three

