

What Can a Culture of Hispanic STEM Success Look Like

HETS Best Practices Conference 2020

San Juan, Puerto Rico



Mary Jo de Garcia Parker, EdD

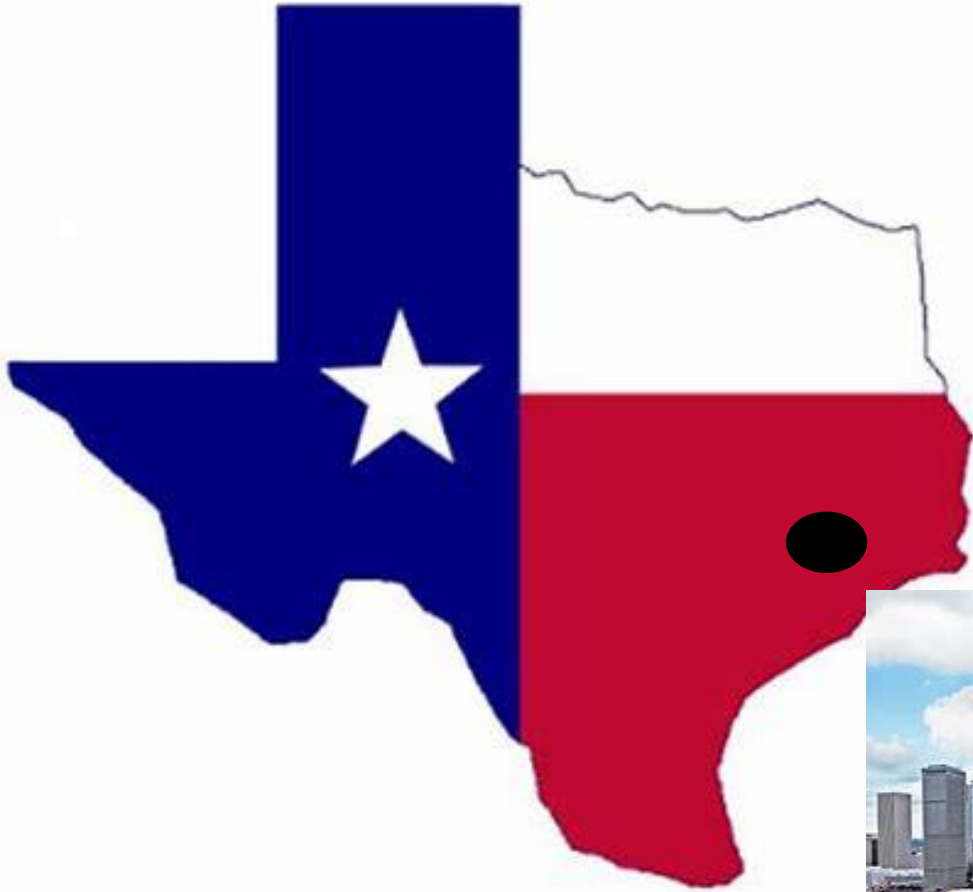
Executive Director Scholars Academy/Natural Sciences Faculty

University of Houston-Downtown, Houston, Texas United States

Overview

- Changing demographics
- Changing workforce
- Minority-Serving Institutions training the new workforce
- University of Houston-Downtown
- Scholars Academy
- Program Components Creating Pathway
- Infrastructure
- Role of Mentors
- Broadening Experiences
- Alumni Successes
- Mechanisms to Creating Collaborating Partnerships

University of Houston-Downtown





UHD
University of Houston
DOWNTOWN

UHD Undergraduate Institution

- Urban 4-Year University since 1974
- Hispanic Serving Institution
- Minority Serving Institution
- **Tuition is 3rd most affordable in Texas**
- Over 41 bachelors and 9 master degrees
- Almost 15,000 Students
- Over 3,000 new students each year
- Over 2,000 graduates each year
- Over 1700 majors in College of Sci & Tech



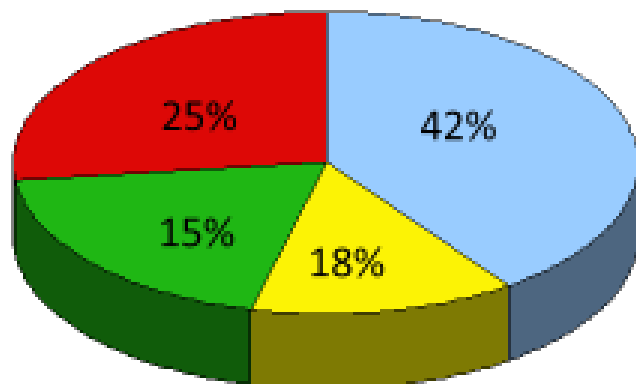
- UHD in 3rd largest U.S. city
- HSI/MSI federally-designated institution
- 61% of 15,000 undergraduates receive some form of need-based federal aid
- ~76% first generation



SA Demographic Overview

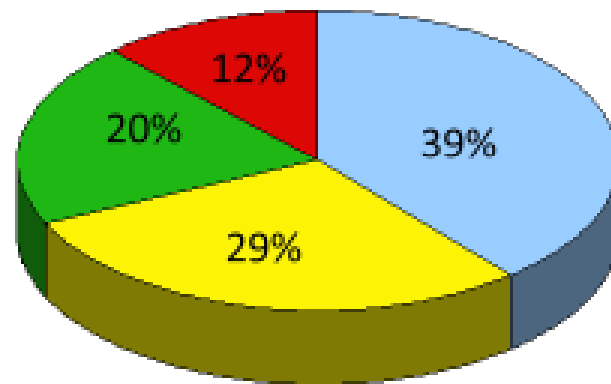


Scholars Academy



Male - Female
 40% - 60%

UH-Downtown



Male - Female
 38% - 62%

- Hispanics
- African American
- Caucasian
- Asian/ Other

UHD has the most diverse student population of any liberal arts university in the Western U.S., according to *U. S. News & World Report*.

Scholars Academy Academic Unit

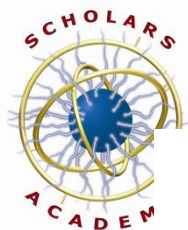
- ❑ 1999 – current (19th year)
- ❑ ~ 1,500 alumni
- ❑ ~ 180 - 200 current membership
- ❑ Funds ~\$1,500-\$3,000 per year to all members
- ❑ 69% 6-year graduation rate (disaggregate) (FTIC overall)
- ❑ 74.2% all graduates
- ❑ 91% Retention rate (disaggregate)

Career Pathways to Advanced STEM Degrees (outcomes of Scholars Academy)

- ❑ 51% acceptance to medical schools
- ❑ 44% acceptance to graduate/professional schools (FTIC)
- ❑ 41% acceptance to graduate/professional schools (ALL)
- ❑ 93% remain in STEM fields after graduation
- ❑ 52% enter the STEM workforce

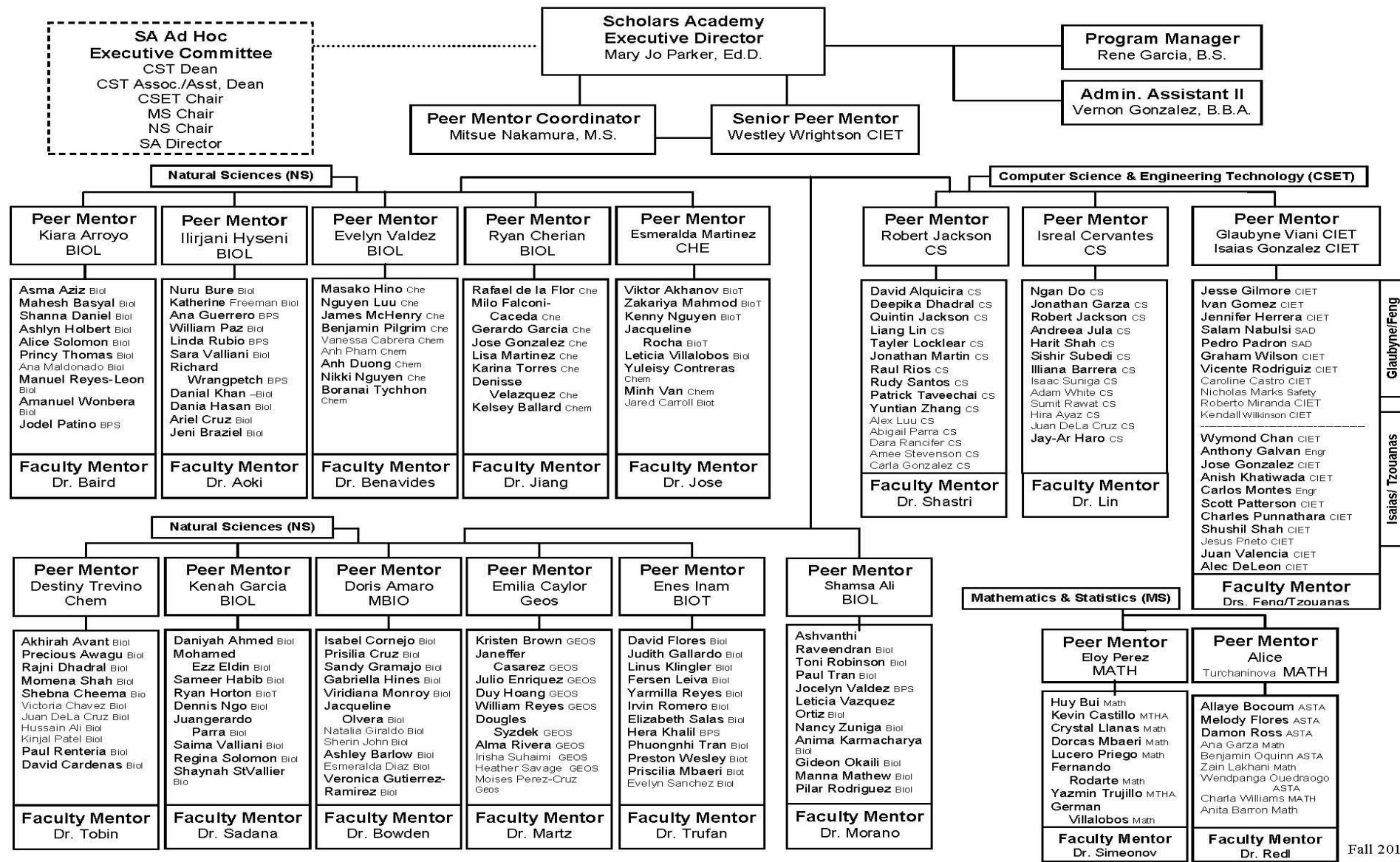
Consequential References

- **Establishing career skills topical reviews** (Upcraft, Barefoot, and Gardner, 2005)
- **Understanding how research and innovation occurs** (Lopatto, 2007; 2010)
- **How critical teamwork is to workplace and research innovation**
(Haas and Mortensen, 2016)
- **Peer-led team-learning** facilitation provides the methodology **for learning and improving teamwork** for undergraduates (Steitweiser and Light, 2010)
- **Preemptive course reviews and study sessions** (Malcom and Feder, 2016)
- Facilitating **research skill development** (Lopatto, 2009; Kuh and Hu, 2001; Hunter, Larsen, and Seymour, 2007)
- **Recognizing predominant barriers** (such as first semester biology, chemistry, mathematics courses; lack of relationships; first generation students having no prior knowledge of what to expect; financial security to persist/complete) to successful retention, persistence, and six-year graduation of minority and female undergraduates pursuing STEM degrees (CUR, 2008; Pender, Marcotte, StoDomino, and Matson, 2010; Kuh, 2008)
- **Mentoring assists in modeling STEM academic success and in establishing communication lines among peers and faculty** as well as in establishing and **building vital relationships for future STEM success** (Kuh, 2010)



The Infrastructure - Discipline-based Learning Communities

Fall 2015 UHD Scholars Academy Organizational Chart



Communication Devices

- **SA Weekly Digest** – a compilation of announcements, success congratulatory notices, field trip and seminar announcements, summer research opportunities, internships, employment announcements, other
- Outlook Email Contact listing for push emails
- **BlackBoard Learn Organization** – a field trip enrollment, communication with FM and PM, other announcements
- **LinkedIn** SA Group – all must link with ED and sign up for group
- **SA Facebook** – members only
- **Twitter** – ED sends out some information
- Soon to Come- Instagram for SA community
- **Bi-Annually Orientation** – SA Community membership & PM/FM (first week of each semester)
- **4-5 F2F PM/FM Networking Meetings** – each semester
- **Open Door** – ED, SA Program Coordinator, SA Admin Assist.

Creating the Culture through the: SA Five Point Model

- Mathematics Review & ByPass Examinations (June)
- Pre-college entrance activities (July)
 - Research lab visits
- START FTIC Week (August)
- PM/FM Training off site (August)
- Early semester orientation meetings
 - All SA members within discipline based groups
 - Mentoring system with faculty/peer mentors in **discipline-based groups**
- FTIC Seminar course / cohort
 - Service learning targeting middle school STEM; **RESEARCH Exposure**
- Transfer Seminar course / cohort
 - Service learning targeting middle school STEM; **RESEARCH Exposure**
- Activities within seminar courses introduce research
 - FTIC “movie project” introduction to teamwork & research
 - Transfer interview a professor & mini research proposal
- Early career mentored research (FTIC)
- Required applications to REUs, SURPs, National Labs (2 / sem)
- Developing the curriculum vitae & personal statement (fall/spring)

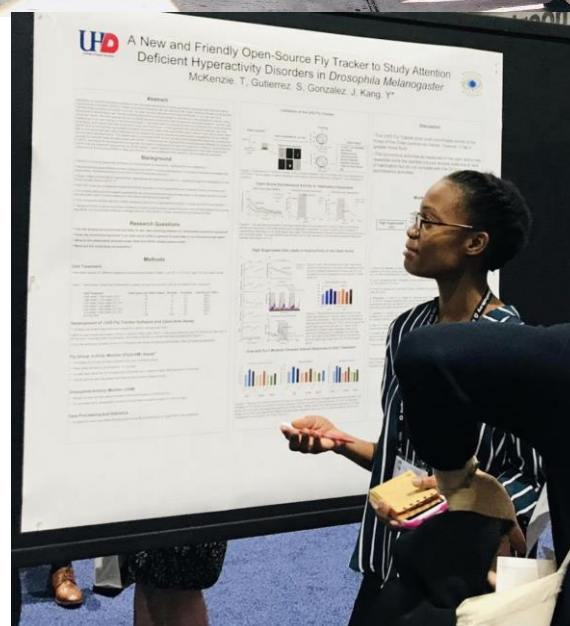
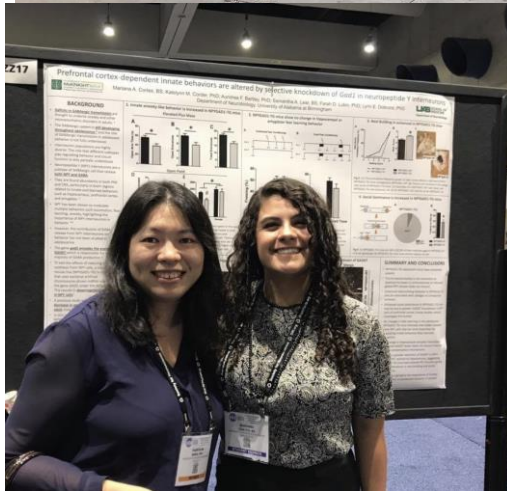
Creating the Culture

- Career broadening experiences
 - Field trips & scholarly seminars
- PhD – mentored research experiences
 - Academic semesters, summer on-campus
 - Off-campus, REUs, SURPs, or Internships with industry
- Exposure to graduate / professional advanced programs
 - Graduate School and Internship Fair (on campus)
 - Invitation to Workforce Alumnus as presenter
 - Student Research Conference (on campus, university-wide)
 - Invitation to PhD/MD Alumnus as Keynote
 - National Conferences: Great Minds in STEM (formerly HEENAC), Grace Hopper, HACU, SACNAS, ANS
- GRE workshops and HETS.org preparatory center online

Creating the Culture

- Venues for Presentation and Oral Communication practice
 - Scholars Academy Graduate School & Internship Fair and Poster Session-25-30 posters for graduating seniors
 - UHD Student Research Conference – competitive oral selections; 100+ posters
 - Gulf Coast Consortium- local
 - Capital of Texas Undergraduate Research Conference-state
 - ABRCMS- national
 - Texas Academy of Sciences State Conference-state
 - American Nuclear Society Student Conference- national
- PhD-led “how to prepare research posters” workshops twice/year
- PhD-led “refining your oral presentation” workshops annually
- Development of Biosketch, Cover letters, Curriculum vita/Resumes, Personal Statements (graduate school applications/employment)

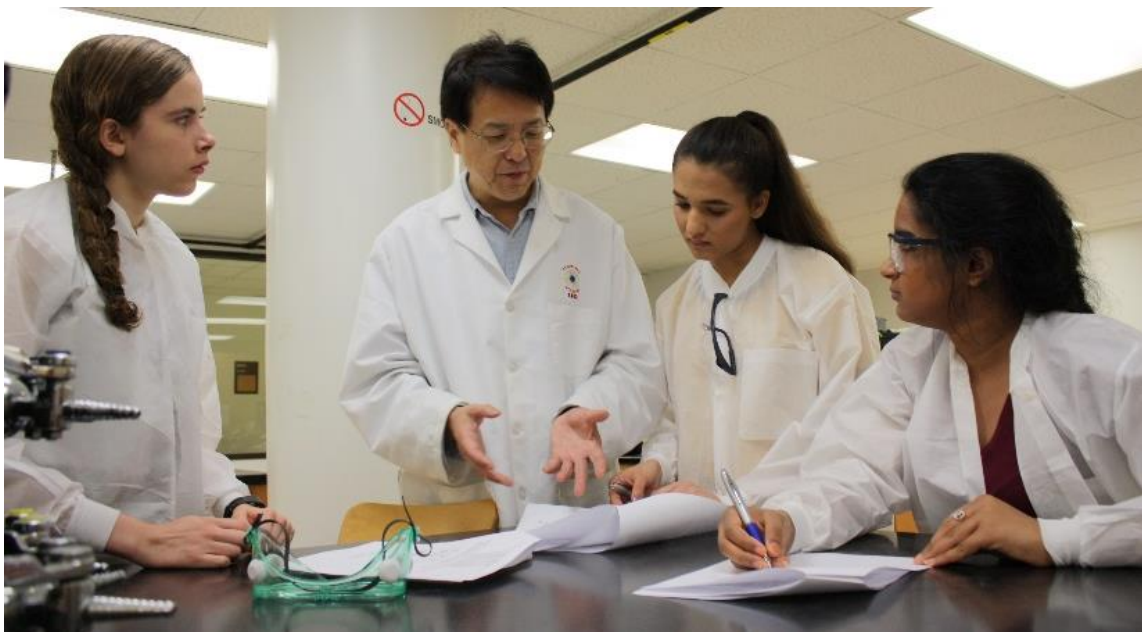
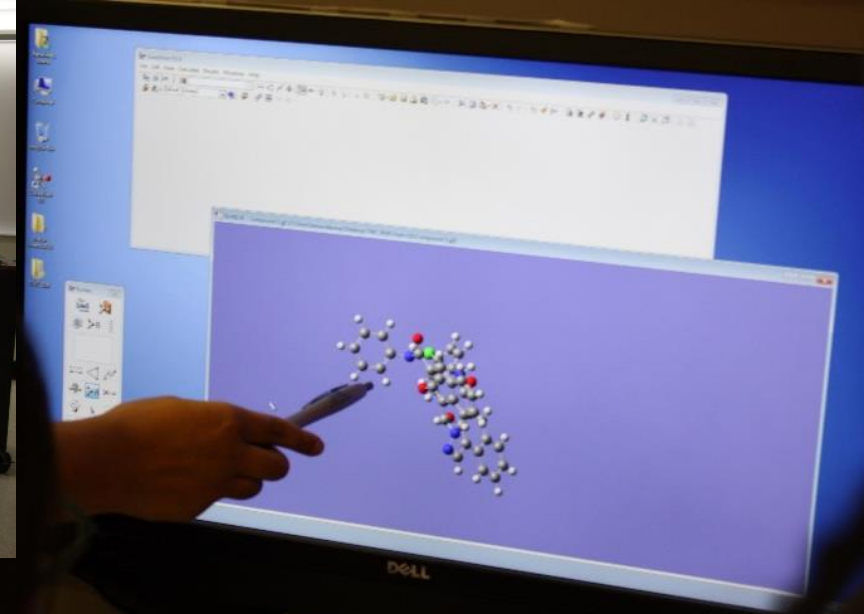
Student Research Conference Travel Support



Creating the Culture

- **Leadership** development opportunities
 - Peer led team learning (PLTL) workshops
 - PLTL tutoring in math, computer sciences, natural sciences, engineering technology, data science, physics, biochem, genetics, other
 - Undergraduate Peer leaders facilitate FTIC seminar & Transfer seminar
- **Trained Peer Mentors** (off site Challenge course activities)
- **Trained SA Ambassadors** (monthly meetings learning to represent the SA and UHD)
- **FM/PM discipline-based small learning communities service projects**
- **Faculty Mentor** training sessions/bi-semester

PhD Mentored Undergraduate Research Opportunities (academic semesters, summer)



Facilitating Undergraduate Mentored Research

Year-round Undergraduate Research Program

Early Research for Freshman (FTIC)

Promotion of Off-Campus Research

Student must apply for two summer research programs each semester

Conference Travel Support

Must be accepted for poster, paper, oral presentation

UHD/SA Student Research Conference

Example Grant Awards Supporting Mentored Research

Department of Education MSEIP 2003, 2006, 2013, 2019

Texas Wagner-Peyser Workforce 2012, 2015, 2017, 2018

Nuclear Regulatory Commission MSIP 2010, 2015

Nuclear Regulatory Commission Scholarship IUP 2013, 2017

NOAA 2012

NSF Louis Stokes AMP 2006-present

Welch 2015-present

NSF Noyce Teacher award, 2009-2015

Army Research Office, 2003

Annual Graduate School & Internship Fair

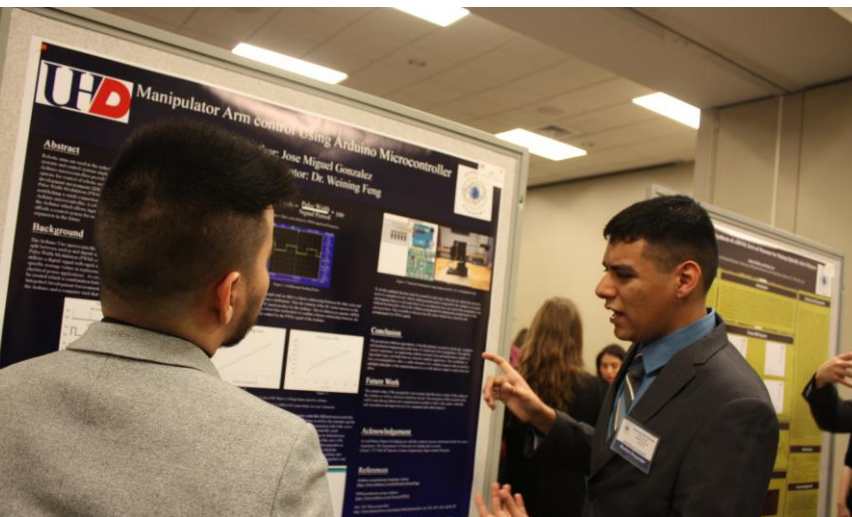
- Promote Academy members to prospective graduate schools & companies (Houston and nation-wide)
- Included Summer Research poster sessions for graduating SA Academy & UHD seniors
- ~55-60 STEM graduate and internship program representatives attend



Annual UHD Student Research Conference

(university-wide)

- Promote Academy members and UHD undergraduates research to the larger university community
- Showcase up to 100 mentored undergraduate research poster projects (PhDs are showcased through this work)
- 8-10 Oral undergraduates present on research
- University-wide attendance encourages student research across the university community
- STEM Alumni Keynote



Longitudinal Data Collection & Technology

Within Scholars Academy

- Internal disaggregate data maintained for over 15 years
- Alumni email updates to ED or other PhDs who share with ED
- Both MS Access and Excel maintain data for calculating retention and 4,5,6 year graduation rates and overall rates (overall includes transfers)

Office of Institutional Effectiveness

- Queries for grant awards inform
- College warehouse reports
- THECB reports for UHD
- PeopleSoft

CST Asst Dean for Advising

- Queries for gpas
- Queries for graduation lists
- Queries for honors
- PeopleSoft

FY14 Six-Year Graduation Rate FTIC Data (Disaggregate)

6-Year Graduation Rate of
All FTIC students: 86/122:
70%

6-Yr Graduation Rate, by Ethnic Category:

White: 6/9 = 70%

Black: 14/20 = 67%

Hispanic: 44/59 = 75%

Asian: 13/22 = 59%

Amer.Indn./Alaskan Native = 0

International: 8/10 = 80%

Native Hawaiian = 1/1 = 100%

Contextualizing the DATA:

Six Year Graduation Rates for Texas Public Colleges Comparison (Brand, 2015)

Texas Public Colleges	6 Yr Grad. rate	Texas Public Colleges	6 Yr Grad. rate
University of Texas at Austin	80.30%	Texas A&M University at Corpus Christi	37.60%
Texas A&M University at College Station	79.90%	Texas A&M University at Commerce	36.70%
[UHD Scholars Academy]	70%	Texas A&M University at Kingsville	36.60%
University of Texas at Dallas	63.20%	University of Texas-Pan American	35.50%
Texas Tech University	62.60%	University of Texas at El Paso	35.50%
Texas State University at San Marcos	55.40%	Prairie View A&M University	31.70%
Sam Houston State University	49.40%	Texas A&M University at Galveston	30.80%
University of North Texas	48.40%	Lamar University	28.10%
Texas Woman's University	48.20%	University of Texas at San Antonio	26.60%
University of Houston main campus	45.70%	University of Texas at Brownsville	19.60%
Stephen F. Austin State University	44.60%	Texas Southern University	13.30%
West Texas A&M University	39.90%		
University of Texas at Arlington	39.60%		
University of Texas at Tyler	37.80%		

First and Most Recent Invited Alumni to Present Their Story
as Part of the Student Research Conference Keynote

Year Invited	Alumnus	Advanced Education	Place of Employment
1999	First Cohort Enters SA		
2003	Phebe Chen	MD	Chief of Ultrasound, Department of Radiology, UT- Houston Health Science Center
2019	Miriam Morales	PhD	Associate Vice President Data Science Memorial Hermann Health System

Alumni Initiating the Career Pathway

Year Invited	Alumnus	Clinical /Medical Education	Place of Employment
2003	Phebe Chen	MD	Chief of Ultrasound, Department of Radiology, UT-Houston Health Science Center
2005	Christopher Matranga	PhD	NETL
2008	Evan Cohen	MD	Cardiothoracic Surgery
2010	Vedangi Sample	PhD	Johns Hopkins University School of Medicine
2011	Obadiah Kegege	PhD	NASA Glen Research Center
2012	Mesias Pedroza	PhD	Baylor College of Medicine
2013	William Holtkamp	PhD	Software Engineer, OpenLink Financial
2014	Jennifer Abrams	PhD	UT-HSC Houston Graduate School of Biomedical Sciences
2015	Phillip Gallegos	MD	Anesthesiologist USAP Pinnacle Anesthesia Consultants
2016	Claudia Jimenez Struman	PhD	Gene by Gene Assistant Laboratory Director
2017	Elda Rueda	PhD	Post-doctoral Associate, Molecular Physiology & Biophysics, Baylor College of Medicine
2018	Nameera Baig	PhD	Post-doctoral Researcher, E.& J. Gallo Winery; UC Berkley Lawrence Hall

Alumni Legacy of Pathway (1999-2018)

- ❑ MDs = 64
- ❑ PhDs/PA/DVM = 79
- ❑ MS/MAT/MBA/MEd = 126
- ❑ JD = 3
- ❑ BSNs = 123

Time Period	PhDs	MD	PA/Pharm/ DDS/DVM
1999 – 2018 (18 years)	62	64	28
2015 – 2018 (3 years)	24	22	
2017-2018 (15-months)	10	3	

Many of Our Partners with the Houston-Galveston Metropolitan Area

- Texas Medical Center
- MD Anderson Cancer Center
- UT Houston Graduate School of Biomedical Sciences
- UTMB Graduate School of Biomedical Sciences
- UT Houston School of Public Health
- McGovern Medical School
- UT-San Antonio Graduate School of Biomedical Sciences
- UT-San Antonio Medical School
- TAMU Medical School
- TAMU Health Science Center
- Baylor College of Medicine-Houston
- UT Southwestern
- Johns Hopkins School of Medicine



Partnership Facilitation

- Scholars Academy Advisory Council
- Participation in Harris County Education Science Leadership
- Open Houses for College of Science and Technology
- Participation in Houston Hispanic Forum
- Participation in Hispanic Scholarship Fund Program
- PreCollege Summer Research Offerings (funding through grant awards)
- Field Trip (broadening experiences) targeted each semester
- Scholarly Seminar guest presenters (funding through grant awards)
- Invitations to GSIF and Student Research Conference Events

Thank you.

Questions?

Dr. Mary Jo Parker
parkerm@uhd.edu
713-221-8471



University of Houston
DOWNTOWN

