



UNIVERSITY SYSTEM
of MARYLAND

Agenda Item 2

Towson's HHMI Inclusive Excellence Project

SUMMARY OF ITEM FOR ACTION
INFORMATION OR DISCUSSION

TOPIC: Towson's HHMI Inclusive Excellence Project -- Dr. Laura Gough, Professor and Chair of the Department of Biological Sciences, Towson University (information item)

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: September 7, 2017

SUMMARY: Towson University (TU) was recently awarded a \$1 million STEM grant from the Howard Hughes Medical Institute (HHMI) to cultivate the talent of students in the natural sciences. The HHMI initiative focuses on undergraduates who come to college from diverse backgrounds and pathways, including underrepresented ethnic minorities, first-generation college students, and working adults with families.

The TU proposal was one of over 500 pre-proposals submitted, one of 90 invited full proposals and one of just 24 grants awarded. The university aims to create a curriculum and support system promoting participation in research experiences that will continue beyond undergraduate studies. Dr. Gough is the Principal Investigator for the prestigious HHMI grant, which will enable the university to further enhance its recent growth in minority STEM majors.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: This item is for information purposes.

CHANCELLOR'S RECOMMENDATION: This item is for information purposes.

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742 / Suresh Balakrishnan (301) 445-2783

Towson University-Research Enhancement Program (TU-REP)

Creating a Culture of Inclusive Excellence in STEM

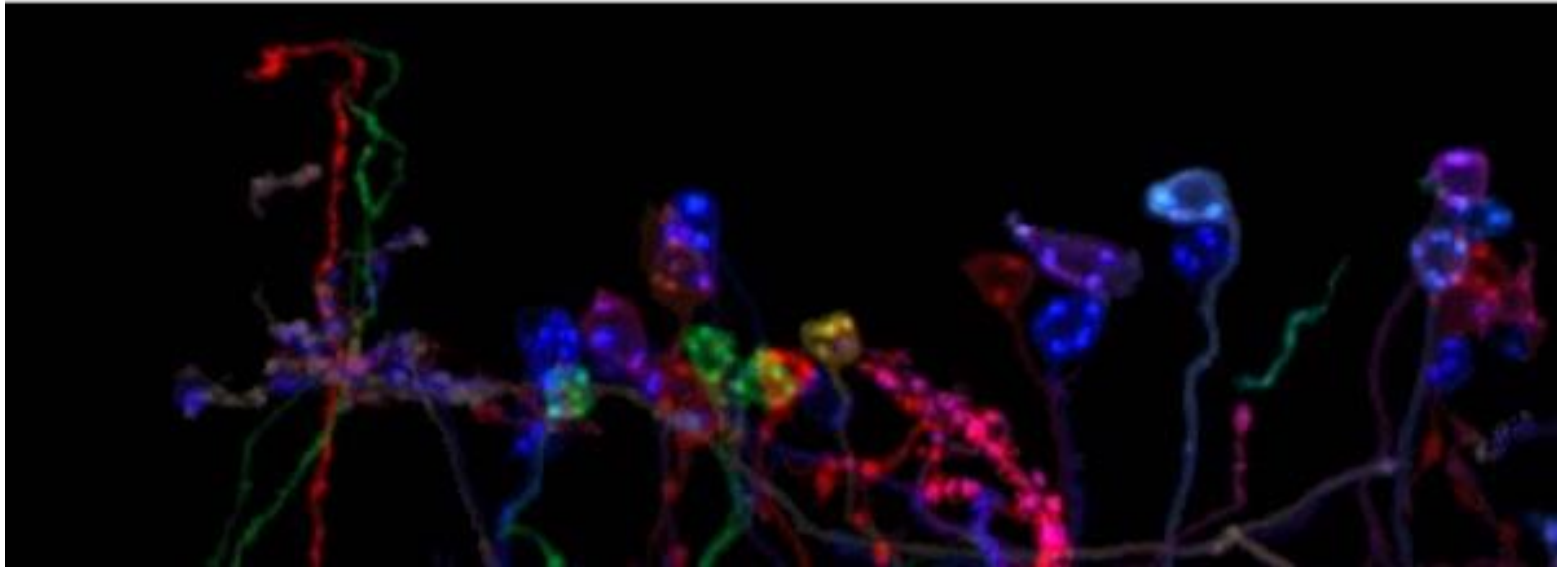
Dr. Laura Gough, Professor and Chairperson
Department of Biological Sciences



Inclusive Excellence

Engaging all students in science

hhmi | Howard Hughes
Medical Institute



Association of American Colleges & Universities



Inclusive Excellence Commission

<https://www.aacu.org/commission>

Inclusive Excellence Awardees

- 511 pre-proposals submitted, 89 full proposals invited, 24 grants awarded at \$1 million for five years each
- 2018 competition will award 25-30 more
- non-renewable: all changes must be sustainable

- Towson University: only university in Maryland
- Other awardees include:
 - Western Washington University
 - University of California Davis
 - Oberlin College
 - Virginia Tech

TU Student Demographics (2015-2016)

- 21,635 enrolled students
- natural science majors
 - 1832 enrolled
 - 62% female
 - 32% under-represented minorities
 - >21% first generation college
 - admittance type
 - 56% began as first-year students
 - 24% transferred from 2-year school
 - 18% other transfer
 - 2% second bachelors

Degree Completion Patterns

- Of 389 natural science majors enrolled in introductory chemistry in 2011-2012:
 - 48% completed bachelor's in natural science in 5 years (3% still working towards degree) (total: 51%)
 - 21% completed bachelor's in other field in 5 years (4% still working towards degree) (total: 25%)
 - 24% transferred away from Towson or no longer enrolled
- Pattern differs when focused on transfer students

Increasing Student Engagement via Research Experiences

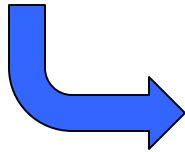
- TU Biology Faculty
 - 32 research active faculty
 - heavy teaching load plus MS student mentoring
 - ~1000 Biology majors plus ~450 majors in related interdisciplinary programs
- traditional apprenticeship approach does not satisfy research demand from students

Bringing Authentic Research Into the Classroom

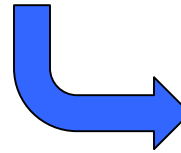
- Create CUREs (Course-based Undergraduate Research Experiences)
- Increase retention of all students
- Produce scholarship output for faculty
- Existing course in Molecular Biology (funded by NSF)
- Expanding to include:
 - Cell biology
 - Genetics
 - Ecology
 - Biochemistry
 - Organismal biology and evolution
 - Geoscience

Creating a Research-based Curriculum

Students generate a hypothesis based on research question in faculty member's area of expertise

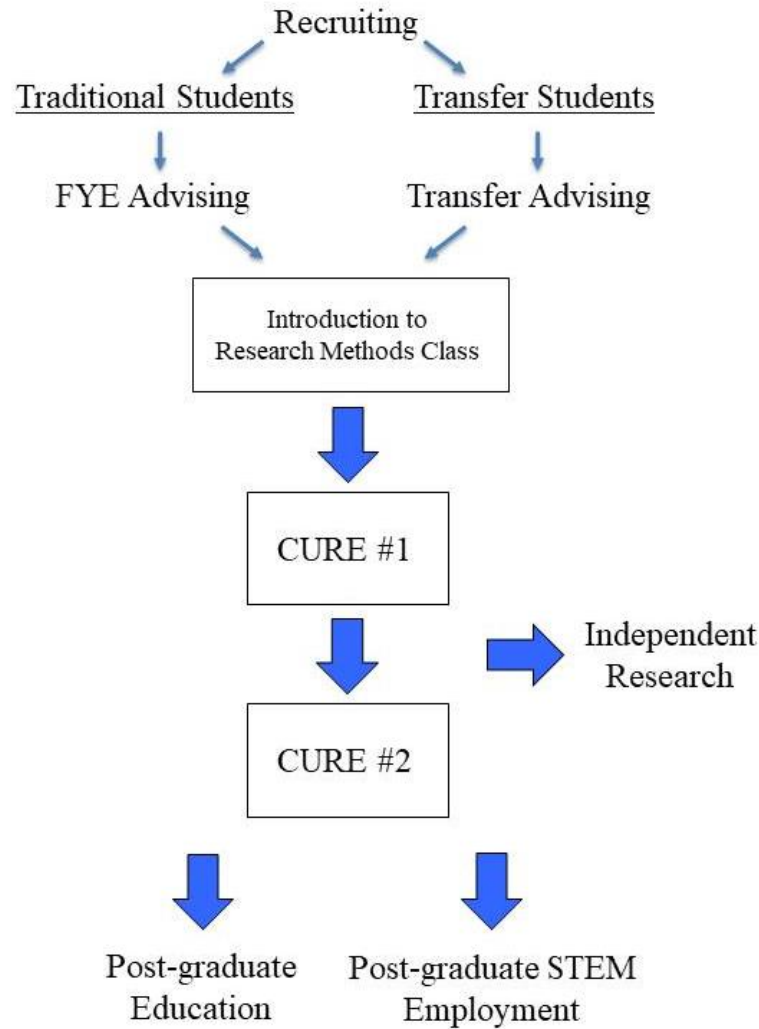


In small groups, students design the experiments and learn the techniques



Students test their hypothesis and report results

TU-REP Student Pathway



Project Team

- Dr. Laura Gough, Biology, Program Director
- Dr. Matt Hemm, Biology, Assistant Program Director
- Dean David Vanko, Fisher College of Science & Math
- Dr. Cindy Ghent, Assessment Coordinator
- Dr. Rommel Miranda, Professional Development
- Faculty from Biology; Chemistry; and Physics, Astronomy & Geoscience
- Institutional Research, Career Center, Admissions, Advising
- TU Center for STEM Excellence

TU-REP Summary

- HHMI has given us a great opportunity & responsibility to conduct this experiment well
- Goal: ensure that TU includes all students in STEM educational and research opportunities
 - Student and faculty components
 - Fits with President Schatzel's priority to create a more inclusive and diverse campus
 - Will help retain a diverse student body in STEM fields and better prepare them for the work force or additional education

