



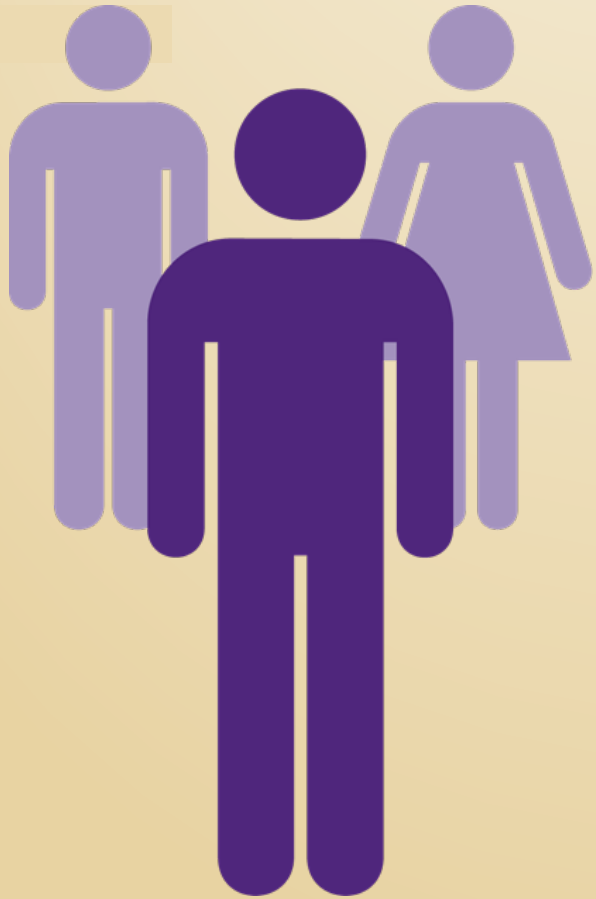
STEM Alliance – Life Sciences

UNIVERSITY OF WASHINGTON BOTHELL



625
GRADUATE STUDENTS (579 FTE)

5,370
UNDERGRADUATES (5,090 FTE)



90%

GRADUATES STAY
IN STATE



1,618

FROM
SNOHOMISH
COUNTY



45%

FRESHMEN
WHOSE PARENTS
DO NOT HAVE
COLLEGE DEGREES



35%

OF UNDERGRADUATE
STUDENTS ELIGIBLE
FOR FEDERAL PELL
GRANTS

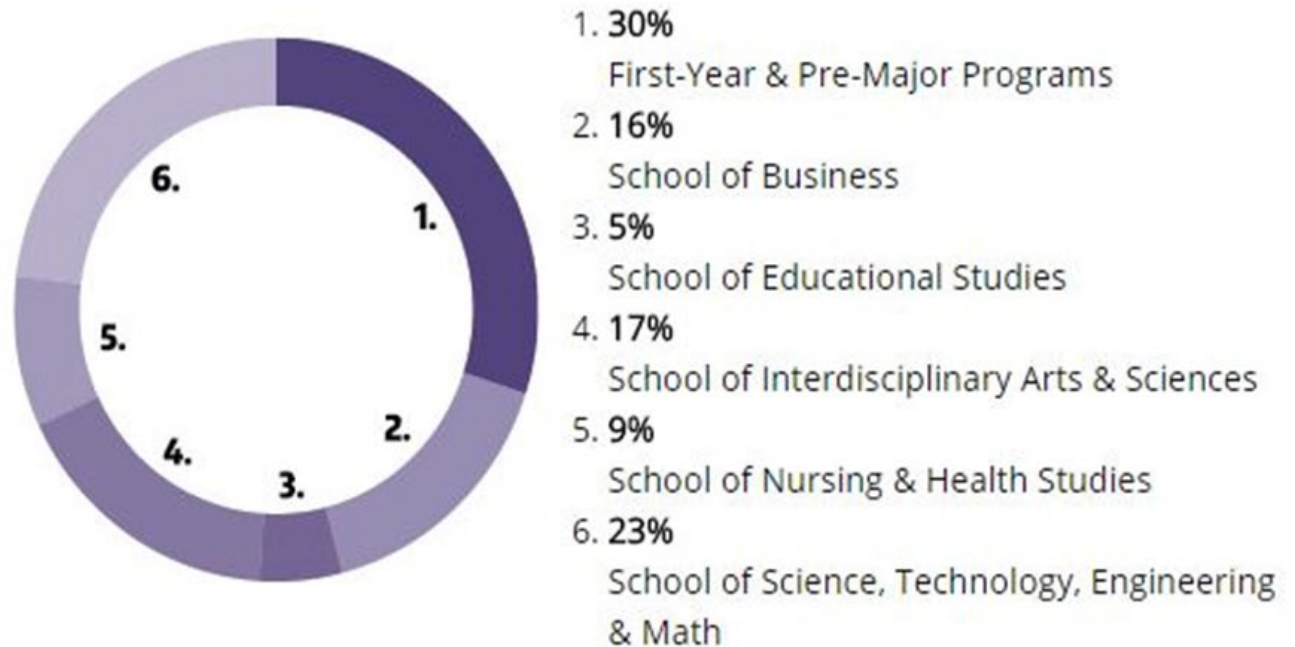
ENROLLMENT

5,995 Total

Total FTE: 5,669

Graduate:
625 (579 FTE)

Undergraduate:
5,370 (5,090 FTE)



UW Bothell has 55 undergraduate and graduate degree programs.

UW BOTHELL SCHOOL OF STEM

Our Vision is to be a leader in providing accessible, innovative, and effective education and research that promotes responsible engagement with our world and society

Our Mission is to support and promote excellence in STEM research, scholarship, and education through commitment to our core values

CORE VALUES



Collaboration across disciplines and among community partners



Opportunity for all students to succeed and become effective critical thinkers



Rigor in the development of research that is globally recognized and serves our students and society



Engagement through challenging and active learning experiences and enriching student-faculty interactions

UW BOTHELL SCHOOL OF STEM

Biological Sciences

Biology (BS)
Consciousness, Creativity & Science (Minor)
Neuroscience (Minor)



Computing & Software Systems

Comp. Sci. & Software Engr. (BS)
Applied Computing (BA)
Comp. Sci. & Software Engr. (MS)
Interactive Media Design (BA-Joint)
Cyber Security (MS)
Comp. Sci. & Software Engr. (Minor)
Info. Technology (Minor)

Engineering & Math

Electrical Engineering (BS)
Mathematics (BS)
Mechanical Engineering (BS)
Computer Engineering (BS-Joint)
Electrical Engineering (MS)
Mathematics (Minor)
Actuarial Sciences (Minor) – under review

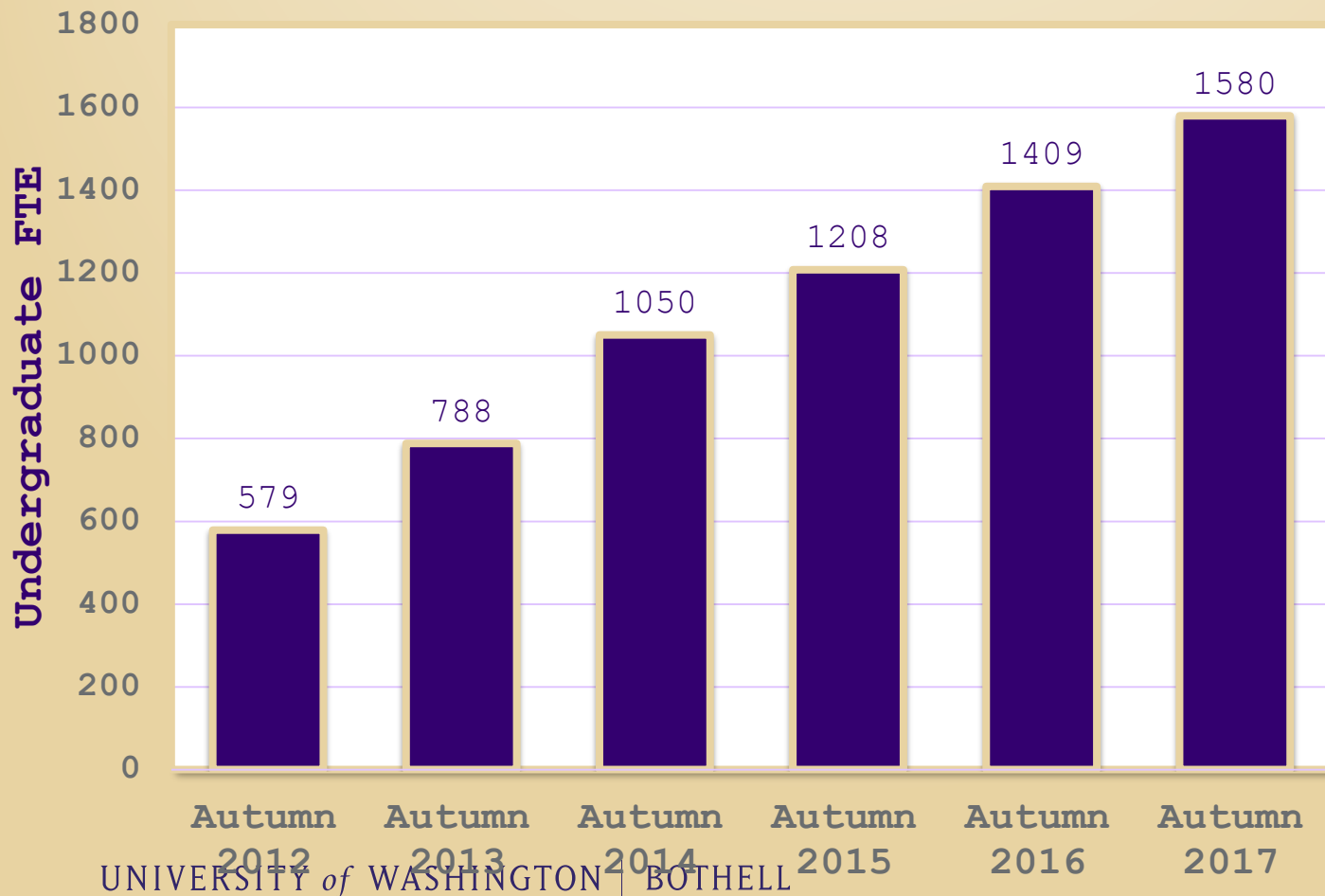
Physical Sciences

Chemistry (BS, BA)
Chemistry – Biochem option (BS)
Physics (BS, BA)
Chemistry (Minor)
Physics & Astronomy (Minor)
Earth System Sciences (BS) –



UW BOTHELL SCHOOL OF STEM

GROWTH IN STEM UNDERGRADUATE FTE



The number of STEM FTE has increased by more than 150%

over the last 5

Similar growth can be seen in our

graduate programs

WE AIM TO PROVIDE OPPORTUNITIES FOR ALL STUDENTS TO SUCCEED IN STEM

2017-18 DEMOGRAPHICS

30% Female

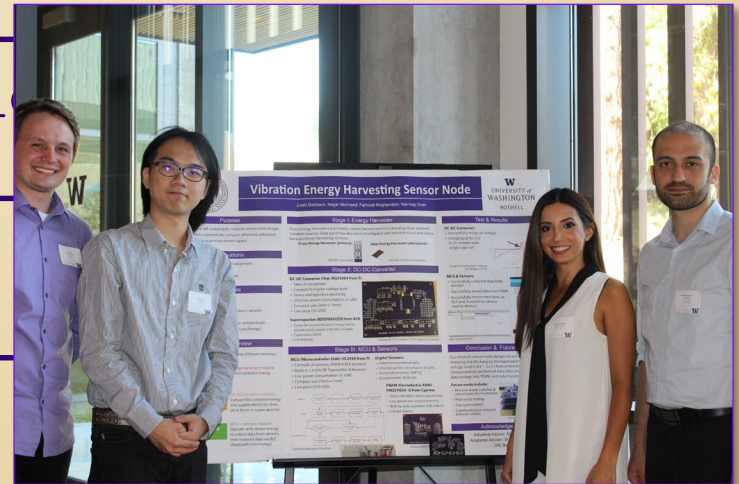
88% Washington Resident

52% WA CC Transfers

30% Pell eligible

38% Have no parent/guardian with a 4-year degree

14% Underrepresented Minority



WE ENGAGE STUDENTS THROUGH HIGH IMPACT PRACTICES

WE DO THIS THROUGH HANDS ON INTERNSHIPS,
UNDERGRADUATE RESEARCH, AND TEAM CAPSTONE PROJECTS



91% participated in high impact practices (HIPs)



76% completed or plan to complete an internship



62% completed or plan to complete UG research



80% completed or plan to complete a capstone project

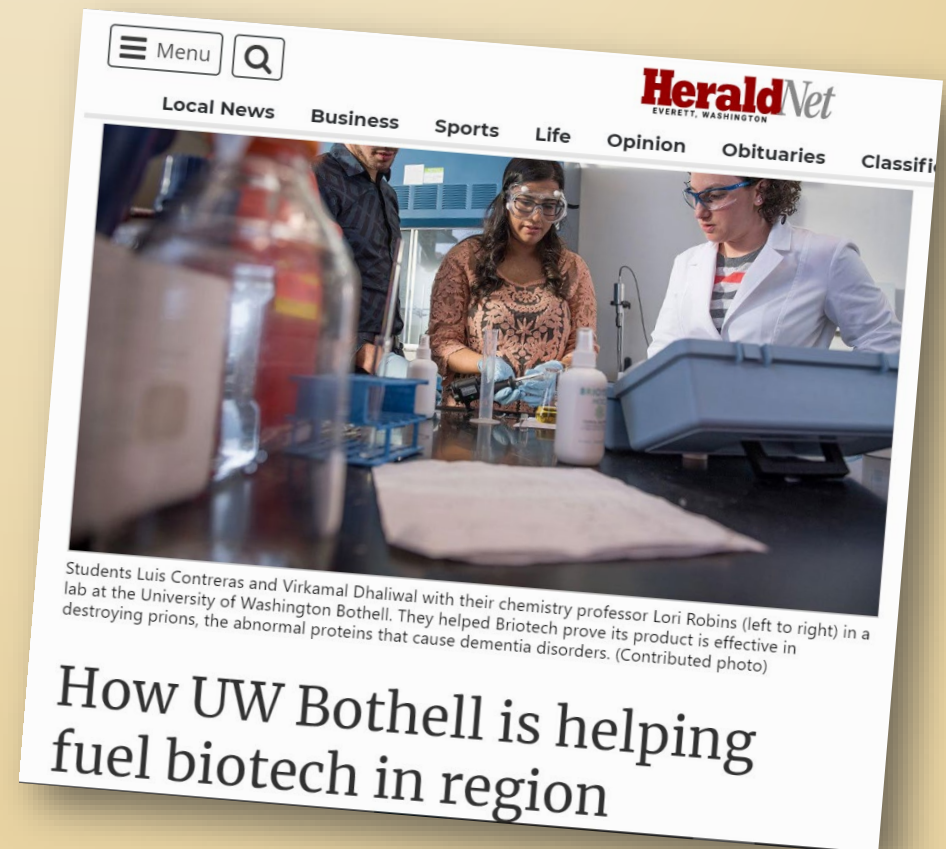
Based on 2017 National Survey of Student Engagement (NSSE)
School of STEM Data - Seniors

WE ENGAGE STUDENTS THROUGH HIGH IMPACT PRACTICES

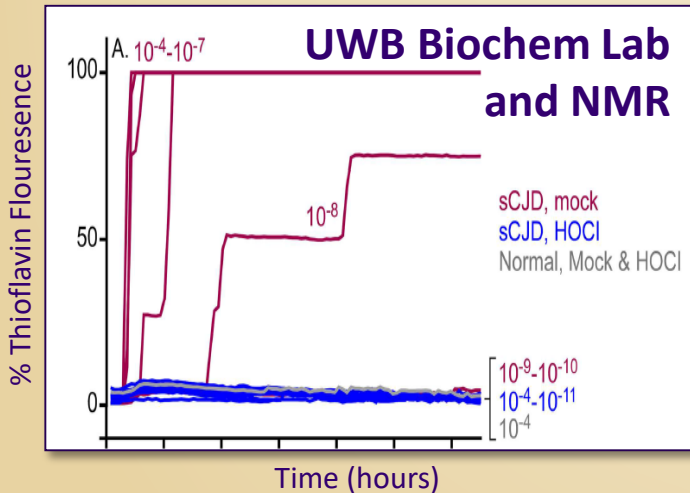
WE DO THIS THROUGH HANDS ON INTERNSHIPS, UNDERGRADUATE RESEARCH, AND TEAM CAPSTONE PROJECTS

UW Bothell and Company Partnership

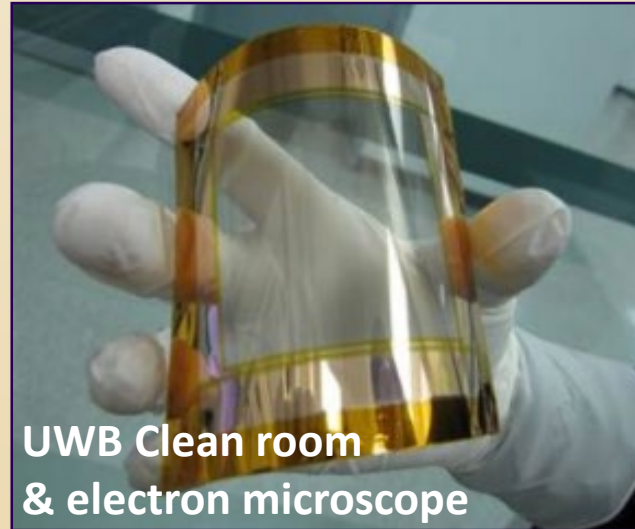
- Chemistry Professor Lori Robins
- Students Luis Contreras and Virkamal Dwaliwal
- Briotech
- Testing product to effectively destroy prions, the abnormal proteins that cause dementia disorders



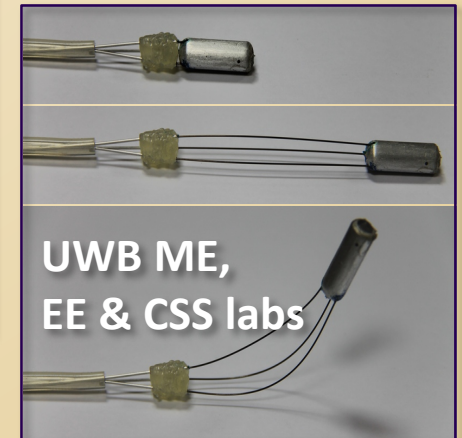
OUR STEM RESEARCH INVOLVES FACULTY AND UNDERGRADUATES WORKING TOGETHER ON IMPACTFUL PROJECTS



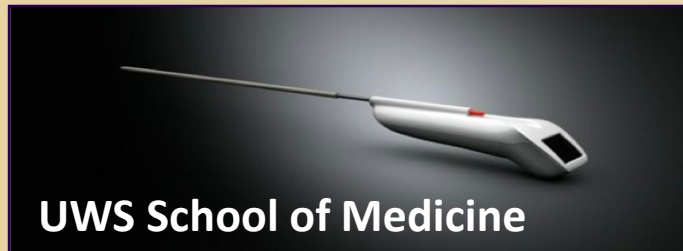
Inactivation of prions and amyloid Seeds with hypochlorous acid (L. Robins)



Flexible organic solar cells (S.S. Choi)



Capsule and gas sensor for stomach *H. Pylori* localization (J. Yoon)

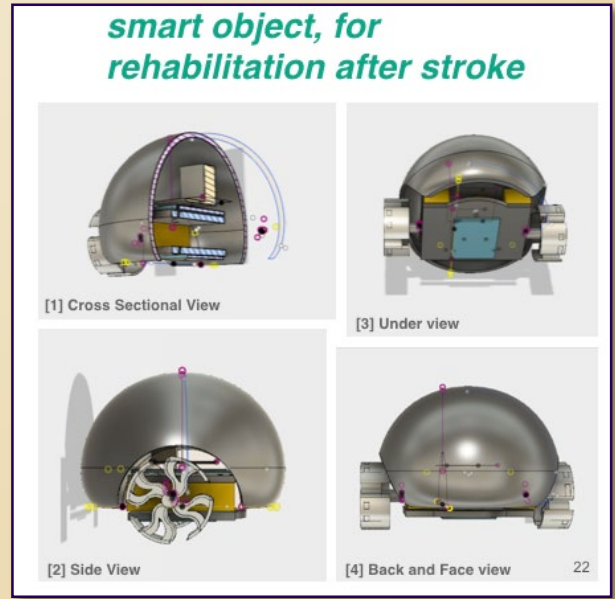
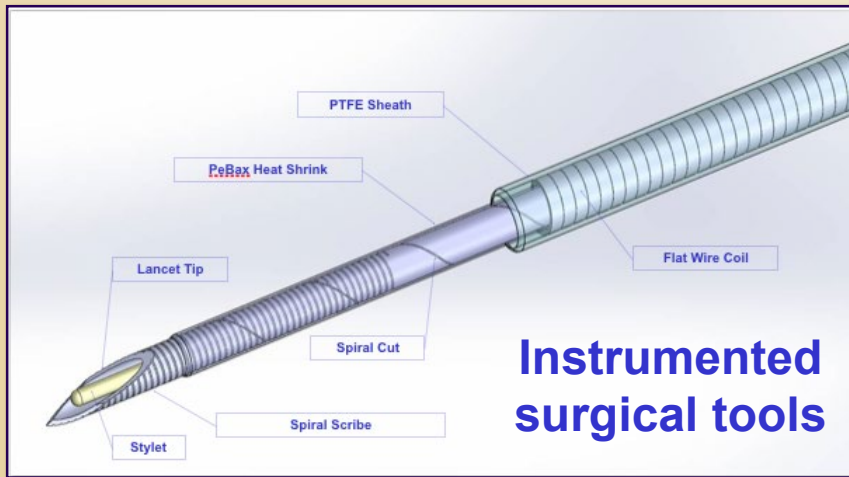


Ultrasound-guided ventricular catheter (P.D. Mourad)



Implantable and wireless pH sensor (H. Cao)

CAPSTONE PROJECTS, A SUMMATIVE CURRICULAR EXPERIENCE, TEACH CRITICAL THINKING & CROSS-DISCIPLINARY COLLABORATION



AR/VR therapy for amputee patients



We seek to use AR/VR to provide more dynamic and varied therapeutic feedback than offered by mirror therapy.

Miniature Underwater Glider

Dr. Sarah Webster, UW Applied Physics Laboratory: swebster@apl.washington.edu

Philip Lamothe and Chanelle Cadot designed the body. Now we need all of the innards!



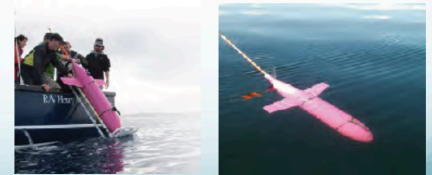
Lead Zeppelin: 1/3 scale model of Deepglider
Soon to be upgraded to clear cylindrical body.

Basic Operation

- Buoyancy controlled – use piston to
 - pull in water to change buoyancy
 - Move ballast fore/aft to control pitch
- Rotate ballast to control roll, which causes it to turn

• Applications

- Automate the process of finding centers of roll, pitch, and buoyancy
- Develop algorithms to self-tune lift and draft coefficients on the fly for optimal flight
- Multi-vehicle coordinated control and swarm research



Deepglider: 6000m rated underwater glider
Photo credit: Charlie Eriksen

UW BOTHELL STEM ADVISORY BOARD

- 17 member Board meets 4 times a year
- Representatives from various industries
 - Jeffrey M. Cohen, Vice President and General Manager, Philips Healthcare
 - Michael Lau, President and Chief Medical Officer, Mirabilis Medica
 - Dan Terry, Founder, BRIOTECH, Inc.
 - Eva Cherry, President and CEO, Silicon Mechanics
- Guide the STEM director and faculty on issues related to STEM education and STEM related industry needs

UW BOTHELL/CASCADIA COLLEGE NEW BUILDING

- UW Bothell Cascadia College Joint STEM Building
 - 19-21 state capital funding appropriation
 - \$79.6 m
 - 100,000 gsf
 - 1,100 FTE
 - Open by Fall 2022
- \$1.5 m operating funds to expand STEM FTE



UW SEATTLE

Department of Bioengineering – UW Medicine/College of Engineering joint department

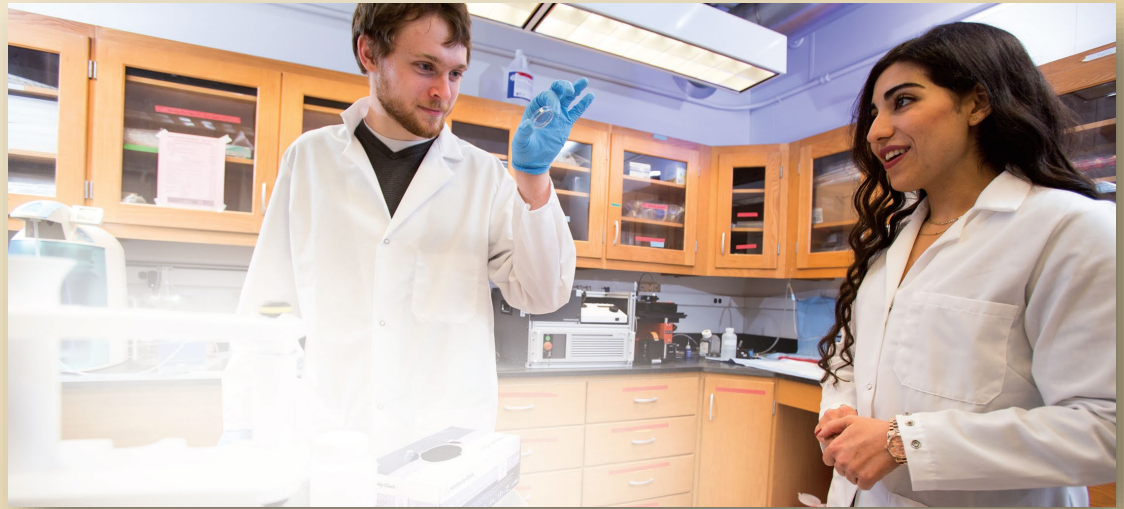
- Our doctoral and undergraduate programs are consistently ranked among the top biomedical engineering programs in the nation by US News & World Report.
- UW Bioengineering is a recognized leader in using education and research to encourage biomedical invention.
- Our students study commercialization with faculty who have taken their research from academia to industry, and they challenge other students in local and national contests of innovation, invention and business plan creation.
- Our faculty and alumni have launched numerous successful start-up companies and regularly license technology to industry partners, fueling our economy and transforming health care.
- UW Bioengineering promotes sustainable, mutually beneficial relationships with individuals, nonprofits and companies in Seattle, nationally and around the world.
- BioEngage program increases engagement of students and faculty with biomedical industry partners.



Engineering Innovation in Health (EIH)

- A program that promotes interdisciplinary collaboration between engineering and the health sciences with the goal of developing technical solutions to pressing challenges in health care.
- Clinicians submit their “problem or unmet need” to the program and if accepted a team of students is assigned to work with the clinician on a solution
- EIH follows a need-based design philosophy that begins with an unmet health or healthcare need. To provide a solution to this need, teams consider a holistic range of factors that contribute to the project’s impact, including stakeholders, market opportunity, intellectual property, FDA regulations, and reimbursement.
- By participating in EIH, students learn not only about bio-medical product design, they also receive an introduction to medical entrepreneurship, learning about the regulatory environment, benchmarking, intellectual property, and funding.

UW SEATTLE



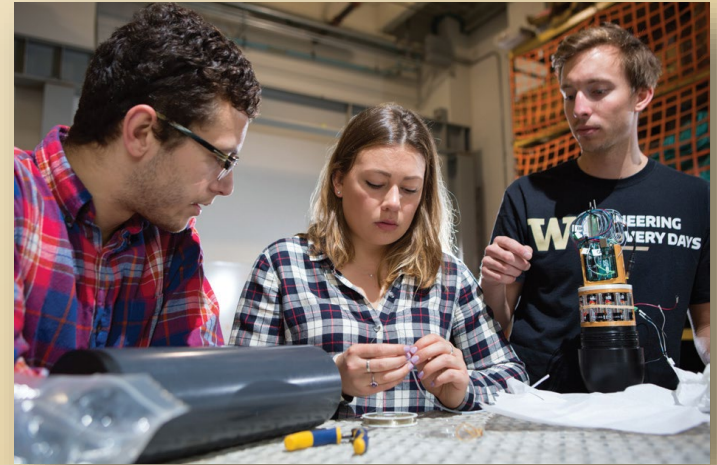
Engineering Innovation in Health (EIH), continued

- EIH prototype solutions are the first step in addressing a clinical challenge. These solutions can be carried forward in a variety of endeavors, including launching the device to generate patents or using the preliminary data gathered for subsequent publications and grant applications. With continued development, the solution provides the potential for new, innovation-based clinical evaluations, research projects, or spinout companies.
- Since its inception, the program has grown to engage students from nine engineering and science departments. Over 200 students have participated in the program — 80% undergraduate, 15% master's, 5% doctoral — and worked with more than 100 clinicians.

UW SEATTLE

The Center for Neurotechnology (CNT)

- One of several Engineering Research Centers (ERCs) across the country funded by the National Science Foundation. Our headquarters are located at the University of Washington in Seattle, and our core partners are at the Massachusetts Institute of Technology and San Diego State University.
- CNT members are engineering new ways to help the brain and spinal cord heal and recover from injury in a unique innovation ecosystem that includes researchers, educators and industry affiliates at multiple institutions and companies worldwide. We work together, with the guidance of our advisory boards, to develop and distribute neurotechnology that is revolutionizing the treatment of stroke, spinal cord injury and other debilitating neurological conditions.



LIFE SCIENCE WORKFORCE GAP ANALYSIS

2018 Legislative Appropriation for Life Science Workforce Gap Analysis and Recommendations

- Industry and Academia Summit/Interviews
- Academia Coursework vs. Industry Needs
- Skills for the Life Science Industry
- Skills and Competencies for Medical Device Firms
- What Washington's Live Science Industry Needs

- UW Bothell creating a introductory class to applied life sciences and engineering for the 2019-2020 school year – increasing awareness of industry

FINAL
Life Science Workforce Gap Analysis and Recommendations

Prepared for
State of Washington – Cascadia College

September 18, 2018

Prepared by



This report is CONFIDENTIAL and is intended only for the sponsors of the study and their designated counterparts.

CONTACT US

- > Pierre D. Mourad, Ph.D. Professor; ME Degree Coordinator
 - doumitt@uw.edu
 - (206) 713- 7797

- > John Naumann, Director of Corporate and Foundation Relations
 - johnn4@uw.edu
 - (425) 352- 5182

- > Kelly Snyder, Assistant Vice Chancellor
 - snyderk@uw.edu
 - (425) 352-3623