



## TRAILBLAZERS

Many notable figures in industry and research earned degrees from the Department of Bioengineering. Here are some outstanding examples of how our alumni are changing the world.

**Wayne Quinton (BS '58)** was an innovator whose contributions to the world of medicine have been numerous. He started Quinton Instruments in 1953, building the first treadmills designed specifically for cardiac testing, and in 1960 helped to develop the hemodialysis shunt, which made giving dialysis treatments to artificial kidney patients easier and safer. Quinton was the UW 2009 Alumnus Summa Laude Dignatus, the “alumnus worthy of the highest praise.” He was an affiliate professor at UW Bioengineering until his death in 2015.

**Wayne R. Gombotz (PhD '88)** is a leader in the pharmaceutical industry with over 20 years in executive management. Currently chief development officer at Immune Design, Gombotz serves on advisory boards for the UW's Microscale Life Sciences Center and the Washington Center for Advanced Materials Technology. He is the co-author of “Current Trends in Monoclonal Antibody Development and Manufacturing.”

**Jay Rubinstein, M.D. (PhD '88)** is a model example of a bioengineer who straddles the line between doctor and researcher. He is the director of the Virginia Merrill Bloedel Hearing Research Center and professor in the departments of Bioengineering and Otolaryngology. His research focuses on signal processing for cochlear implants and he is also known as a superb surgeon. He co-developed a device for patients suffering from balance disorders due to Meniere's disease. He is the first doctoral student to graduate from UW Bioengineering.

**Christopher McInnes (PhD '92)** was behind the research that provided the fundamental science underlying the technology associated with the Sonicare power toothbrush. His research included both clinical trials and laboratory studies. He worked for Optiva Corp., makers of Sonicare, for 12 years and during his tenure saw the company grow from six employees to 600. He is currently doing advanced research for Pacific Bioscience Laboratories, makers of Clarisonic.

*“As one of the first bioengineering departments in the nation jointly housed in Engineering and Medicine, we are a recognized leader in addressing unmet clinical needs through biomedical education, research and technology transfer. Our culture of collaboration with interdisciplinary partners enables us to solve today's biggest health care challenges, here at home and around the world.”*

Cecilia Giachelli, W. Hunter and Dorothy L. Simpson Endowed Chair



**David A. Basiji (PhD '97)** honed his entrepreneurial skills as a UW student. He co-founded Amnis Corporation with technology developed in UW Bioengineering. He is co-inventor of the ImageStream system, a breakthrough technology for high speed imaging and analysis of cells in flow. While at UW, he developed an ultra-sensitive DNA and protein analysis platform for the Human Genome Project, a technology that was later commercially licensed to Oxford GlycoSciences. Basiji currently holds 37 U.S. Patents.

**Joan Greve (BS '97)** is an assistant professor of biomedical engineering at the University of Michigan. She was previously a program manager at the Allen Institute for Brain Science. Greve lead Genentech, Inc.'s MRI Group multi-modality imaging lab and was a core team member of Genentech's Alzheimer's disease program. She was a key figure in designing the strategy for initial phases of an Investigational New Drug filing with the FDA, eventually seeing an antibody to treat Alzheimer's disease from the laboratory bench to the clinic. She is currently an associate editor for the Annals of Biomedical Engineering and was a National Science Foundation Fellow from 2002-2005.

**Arthur Chan (PhD '03)** is the first person at UW Bioengineering to complete a doctorate on focused ultrasound ablation. His research resulted in three patents for an image-guided therapy device and received awards from AIUM and ASRM. Chan is currently a medical affairs liaison at Alcon. Prior to joining Alcon, Chan was medical science liaison at Bausch + Lomb, a clinical affairs manager at Endo Pharmaceuticals, and led clinical marketing and education for InSightec, a medical device start-up. He was the recipient of a Washington Research Foundation Gates Fellowship to pursue technology entrepreneurship.



## Inventing the future of medicine.

**UW Bioengineering faculty and students bridge the traditional disciplines of medicine and engineering to drive health care forward for those in remote parts of the world and here at home. Students, scientists, engineers, and physicians come together in Bioengineering to develop innovative and cost-effective approaches to improve health care. Our interdisciplinary teams collaborate in a wide range of areas, from biomedical imaging to biomaterials, and from diagnostic tools to targeted drug delivery.**

## OUR MISSIONS

### LAUNCHING CAREERS

Our doctoral and undergraduate programs are consistently ranked among the top 10 in the nation by *US News & World Report*. Our students get direct experience working with faculty, conducting research that leads to new discoveries, treatments, and tools. Our graduates pursue diverse careers and leadership roles in industry, academia, and medicine. Our partnership with UW's highly ranked medical school and proximity to Seattle's growing global health community help prepare our students to translate research into clinical applications.

### CROSSING BOUNDARIES

Bioengineering naturally evolved from partnerships between engineering and medicine. Today, our faculty and students continually reach across traditional boundaries in education and research. The interdisciplinary scope of our research spans five overarching themes: biomaterials and regenerative medicine, molecular and cellular engineering, instrumentation, imaging and image-guided therapy, systems, synthetic and quantitative biology, and technology to increase access to health care.

### THE POWER OF INVENTION

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.



# DEGREE PROGRAMS

**Bachelor of Science (BS)** – prepares students for graduate school, medical school, and careers in industry

**Master of Science (MS)** – prepares students for further study or careers in industry and research

**Combined BS/MS Program** – five-year accelerated MS degree program

**Master of Pharmaceutical Bioengineering** – online degree program that prepares working scientists and engineers for leadership roles in the development of drugs and drug delivery

**Doctor of Philosophy (PhD)** – intensive research prepares students for advanced-level careers in industry and academia

**Master of Applied Bioengineering (MAB)** – one-year daytime professional degree program designed to prepare students for industry and translational research

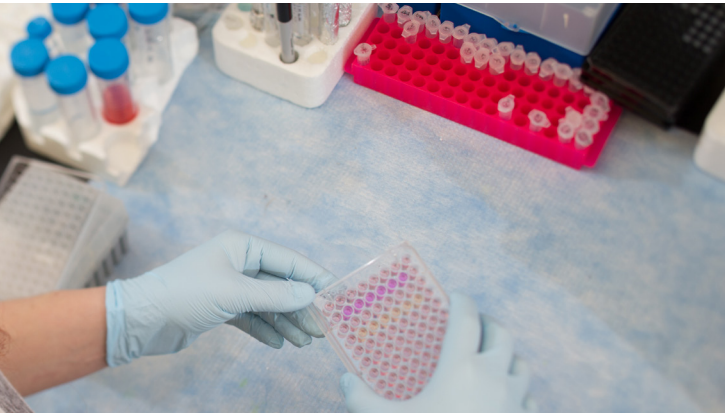
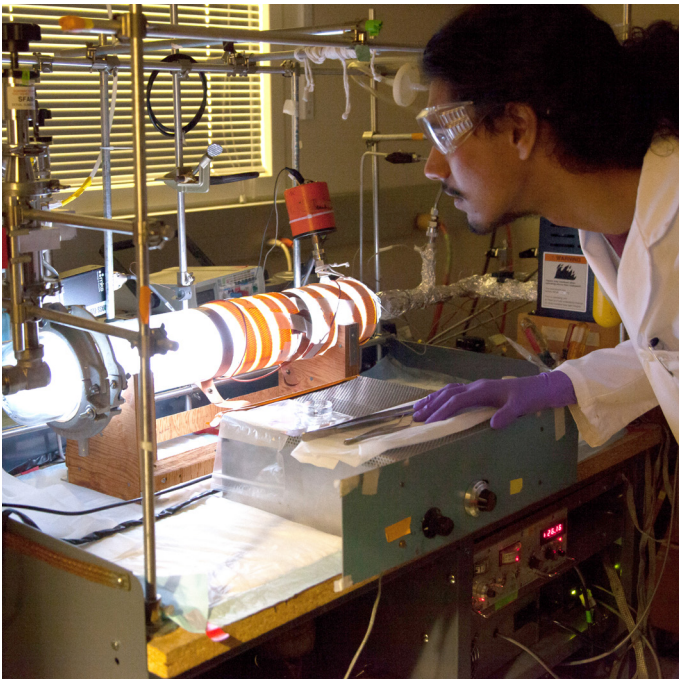
## ADDITIONAL PROGRAMS

- Certificate programs in pharmaceutical bioengineering
- Program on Technology Commercialization – four-course series teaches the fundamentals of translating academic research to marketed product

# STUDENT DEMOGRAPHICS

**Undergraduate enrollment 2015:** 203  
Bachelor’s degrees awarded: 49

**Graduate enrollment 2015:** 157  
Master’s degrees awarded: 25  
Doctoral degrees awarded: 16



# UNDERGRADUATE LEARNING

## Program Features

- Strength in core fundamentals – a foundation for success
- Real-world focus – students develop skills in collaboration, communication, systems analysis and critical thinking; emphasis on leadership and creativity
- Accredited by ABET

## Excellence

- Program ranked 10th by *US News & World Report* for undergraduate programs in bioengineering
- One Rhodes Scholar, one Luce Scholar, one Fulbright Student Fellow, and eight Goldwater Scholars as of 2015
- 31 Amgen Scholars since 2007
- Over 100 Mary Gates Scholarships

# GRADUATE LEARNING

## Program Features

- Develop cross-disciplinary expertise in engineering and biomedical science
- Students enter with degrees from bioengineering, chemical engineering, chemistry, physics, biology, computer science, electrical engineering and related disciplines
- Unparalleled research experience – students begin lab research with faculty from UW Bioengineering and across UW immediately upon entering our programs
- Home to Bioengineering Cardiovascular Training Grant (NIH); faculty and students participate in other NIH training grants at UW

## Excellence

- Program ranked 9th by *US News & World Report* for doctoral programs in bioengineering
- 19 current National Science Foundation Fellows

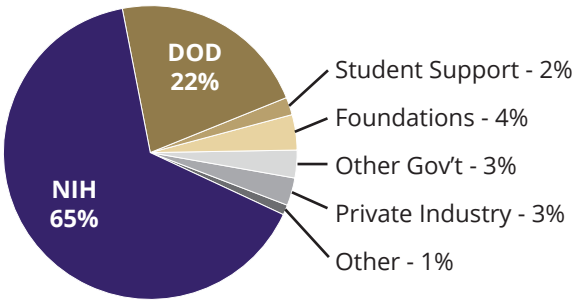
# FACULTY

## Composition

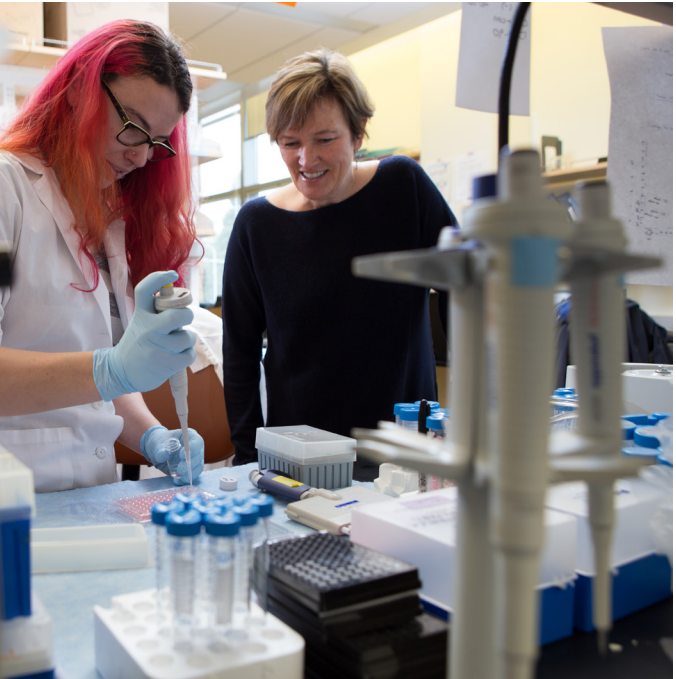
- 50 active core teaching and research faculty
- 53 adjunct faculty
- 51 affiliate faculty
- 52 senior fellows, visiting scholars, and visiting scientists

## Honors

- Six members of the National Academy of Engineering (NAE)
- 21 American Institute for Medical and Biological Engineering (AIMBE) Fellows
- Two UW Presidential Entrepreneurial Faculty Fellows
- One Sloan Research Fellow
- One NAE Fritz J. and Dolores H. Russ Prize
- One Pierre Galleti Award from AIMBE



UW Bioengineering  
External Research Funding FY2015  
**Total \$26M**



# RESEARCH AND INNOVATION

## Research and Discovery

With a strong base of extramural support, our faculty and students conduct a mix of basic and applied research that cuts across traditional boundaries between engineering, physical sciences and medicine. The broad scope of the research spans five overarching themes:

- Biomaterials and Regenerative Medicine
- Instrumentation, Imaging and Image-Guided Therapy
- Molecular and Cellular Engineering
- Systems, Synthetic and Quantitative Biology
- Technology for Expanding Access to Healthcare

## Research Translation

Our success in translating research discoveries to real-world applications is promoted through collaborative, multi-partner initiatives such as:

- Wallace H. Coulter Research Partnership – furthering collaboration between engineers and clinicians and translating biomedical engineering technologies from the laboratory into medical practices
- Ultrasound-Based Washington Molecular Imaging and Therapy Center – advancing molecular imaging and therapeutic technologies and clinical translations using ultrasound-based technology (joint program with Radiology and Applied Physics Lab)

## Market Impact

In FY15, Bioengineering reported more inventions than any other UW department (C4C)

- 1,326 patents filed, 373 patents issued, 3 software copyrights, 100 active licenses
- 759 reported inventions
- 23 existing startup companies resulting from faculty and student research

## Building Bridges

UW Bioengineering promotes sustainable, mutually beneficial relationships with individuals, nonprofits and companies in Seattle, nationally and around the world

- BioEngage - an industry affiliates program that aims to increase engagement of students and faculty with the biomedical translation-commercialization sector and build relationships with biomedical industry