UNIVERSITY OF OREGON

Phil and Penny Knight Campus for Accelerating Scientific Impact

FALL 2024

ANNUAL REPORT

Contents

Image by MIR,
courtesy of ZGF Architects

Dear Friends and Colleagues,

As I reflect on the past year at the Knight Campus, I am filled with a profound sense of pride and excitement. Our journey has evolved from a bold vision into a tangible reality. What was once an ambitious dream is now firmly established, and the results of our collective efforts are truly remarkable.

Our commitment to excellence has been exemplified by the outstanding achievements of our students and the continued success of our programs. This year, we celebrated the graduation of 121 students, including 89 from the Knight Campus Graduate Internship Program, seven with minors in bioengineering, 13 Knight Campus Undergraduate Scholars, nine participants in the Wu Tsai Human Performance Alliance at Oregon, and three dedicated student employees. Their hard work and accomplishments reflect the very best of what we aim to achieve.

I am particularly thrilled to highlight the success of our PhD students from the Department of Bioengineering. Five have been awarded National Science Foundation Graduate Research Fellowships, with two others receiving honorable mentions. This is a testament to the quality and impact of our PhD program, which continues to uphold our commitment to advancing education and research. This commitment is also shared by the Knight Campus Graduate Internship Program, now in its 25th year. The latest cohort brought 89 students to campus this summer, beginning their training with Professional Development and Orientation Week and participating in another phenomenal Inclusion Symposium that featured keynote speaker, Dr. André Isaacs.

We are also excited to launch a new academic program in Brewing Innovation, set to be housed in our state-of-the-art Fermentation Innovation Laboratory beginning fall 2024. This interdisciplinary minor, initiated by Jim Hutchison and Nathan Jacobs, will offer students hands-on learning opportunities in brewing, from design thinking to creating new beers, drawing inspiration from a rich history of brewing that spans 13,000 years.

Our physical expansion is progressing with the ongoing construction of Building 2, a four-story science building that will significantly enhance our research and academic capabilities. This new facility, inspired by the advancements in Building 1, will support our mission to advance research and education, including the expansion of the Papé Family Innovation Center.

As in years past, our faculty continues to achieve remarkable milestones. Dr. Paul Dalton's innovative work on multilayered artificial skin has garnered widespread media attention, while Dr. Marian Hettiaratchi received both the UO Early Career Award and the 2024 Young Investigator Award at the TERMIS World Congress for her pioneering research in biomaterials. Additionally, Dr. Danielle Benoit was inducted as a fellow of the National Academy of Inventors, recognizing her outstanding contributions to biomedical engineering.

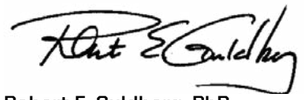
We are also proud of Dr. Keat Ghee Ong's success with Penderia Technologies, which has received multiple federal small business innovation awards for developing advanced medical devices. Dr. Genny Romanowicz's receipt of the K99 Pathway to Independence Award from the NIDCR marks another significant milestone for our research community.

Our vibrant event schedule included highlights such as Science Knight Out with Prof. Mike Hahn, hosting the Oregon Bioengineering Symposium, the Distinguished Lecture with Dr. Joseph DeSimone, and three remarkable speakers for the Entrepreneurship Speaker Series. Additionally, the Knight Campus was pleased to host the Next Gen Biomaterials Workshop. The workshop, which was funded through a collaboration between the National Science Foundation and the National Institute of Biomedical Imaging and Bioengineering at NIH, brought together thought leaders from industry, academics, national labs, and scientific publishing. These events showcased the dynamic research and innovations at the Knight Campus.

The Wu Tsai Human Performance Alliance at Oregon continues to make significant strides in transforming human health through fundamental scientific research, participating this fall in the Global Sports University Network inaugural summit hosted in part at the Knight Campus. The Center for Biomedical Data Science, a joint initiative with the Knight Cancer Institute, is making notable progress under Prof. Bill Cresko's leadership. This center is dedicated to leveraging data science to combat diseases like cancer, further enhancing our research capabilities. As the UO enters into partnership with other institutions in the Big Ten Cancer Research Consortium, the center will be an important point of activity to inform and transform clinical practice.

This June, University of Oregon President Karl Scholz approved a set of goals and strategies that will be included as part of the University Strategic Plan process. Four goals were set forth: enhance pathways to timely graduation, be a leader among the nation's public research universities in career preparation, create a flourishing community, and innovate for societal impact. While the Knight Campus will be a strong partner in each of these objectives, our priorities will especially overlap with the fourth goal, which includes growth in innovation, launching new academic programming, and recruiting additional world-class bioengineering faculty – endeavors that harmonize with our vision for continued development and the forthcoming activation of Building 2.

As we look back on another transformative year, I am filled with pride and anticipation for the future. Our students and faculty continue to achieve extraordinary things, and I am eager to see what lies ahead. Thank you for your unwavering dedication and hard work in making the Knight Campus a hub of innovation and excellence.



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Robert and Leona DeArmond Executive Director,
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Translating Ideas into Practice Throughout Oregon

The Oregon Bioengineering Symposium (OBS) drew more than 300 attendees to the Knight Campus in November, making it the largest event hosted in the building to date. The annual symposium marked five years of collaboration between the University of Oregon (UO), Oregon State University (OSU), and Oregon Health and Science University (OHSU), bringing together scientists, clinicians, and industry leaders from all over the state to meet and discuss topics in the field of bioengineering.

The day of activities was centered around the theme of "Translating Ideas into Practice," with 33 speakers representing each of the three institutions and 115 posters showcasing research from around the state. For the first time, OBS also featured a keynote address by an invited speaker outside of Oregon. Jason Burdick, Bowman Endowed Professor of Chemical and Biological Engineering at the University of Colorado Boulder, gave a talk entitled, "Advances in Biofabrication Methods to Process Biomedical Hydrogels."

In addition to providing opportunities for discussion, learning, and networking, the symposium also celebrated student success, featuring presentations and flash talks by trainees selected as finalists from over 115 abstract submissions. Cash prizes were awarded to the top scorers at the end of the event, recognizing Krista Habing (OHSU) for Excellence in Research, Haylie Helms and Michael Henderson (OHSU) for Best Posters, Melissa Duncan (Willamette University) and Morrhyssey Benz (UO) for Best Undergrad Posters, and Anissa Benabbas (UO) for Best OBS Logo Design.

Events Showcase Scientific Research and Innovation

The Knight Campus hosted Joseph M. DeSimone, Sanjiv Sam Gambhir Professor of Translational Medicine and Chemical Engineering at Stanford University, as the 5th Distinguished Lecturer in the annual series. DeSimone discussed Continuous Liquid Interface Production (CLIP) technology, which embodies a convergence of advances in software, hardware, and materials to bring the digital revolution to polymer additive manufacturing in his talk, "The Delicate Interplay Between Light, Interfaces and Design: 3D Printing of Next Generation Controlled Release Systems."

Other esteemed speakers to visit the Knight Campus this year included best-selling and Emmy-nominated creator of PHD Comics Jorge Cham, Founding Director of the Forward BIO Institute and Professor William Murphy, and Absci CEO Sean McClain – all as part of the Entrepreneurship Speaker Series, bringing talks to inform and inspire scientific translation.

Finally, the annual Science Knight Out event featured Mike Hahn, Professor of Human Physiology, Director of the Bowerman Sports Science Center, and Associate Director of the Wu Tsai Human Performance Alliance at Oregon, for a community talk at the Shedd Institute titled, "Boosting Performance and Improving Human Health." Drawing over 330 audience members, Hahn demonstrated how new sensor technologies and the use of machine learning algorithms are helping to train faster runners and more nimble soccer players – and changing the game for athletes in all sports.

Next Gen Biomaterials Conference

The Department of Bioengineering hosted a two-day Next Generation Biomaterials workshop on May 13-14, 2024, in collaboration with UO's Department of Chemistry and Biochemistry and the Materials Science Institute. The event brought together 48 leading scholars from industry, academia, national labs, and scientific publishing.

Danielle Benoit, Lorry Lokey Chair of Bioengineering and lead organizer, expressed excitement about how the workshop discussions on future biomaterials could address the need for rationally designed materials to advance human health. Biomaterials, engineered to interact with biological systems for medical purposes, are critical for applications like tissue engineering, integrative biology, and drug delivery.

The workshop aimed to bridge the gap between biomaterials research and clinical application. It focused on four key areas, each led by a UO researcher:

- Synthetic biology-enabled biomaterials – Marian Hettiaratchi, Department of Bioengineering
- Smart/responsive biomaterials – Mike Pluth, Department of Chemistry and Biochemistry
- Biofabrication and biointerfaces – Ramesh Jasti, Department of Chemistry and Biochemistry
- Data-driven biomaterials design – Danielle Benoit, Department of Bioengineering

Findings will be published in a white paper and review article. The workshop, funded by the National Science Foundation's Division of Materials Research and the National Institute of Biomedical Imaging and Bioengineering, aimed to catalyze innovation and ensure practical medical applications, and featured a poster session and breakout discussions with UO graduate students and postdocs.

"By bringing together the experts in active matter biomaterials, we foster dialogue and collaboration, driving breakthroughs in healthcare. This will inform the two federal agencies on the topical areas where collaborative efforts are necessary," said Germano S. Iannacchione, division director of the Division of Materials Research at the National Science Foundation. "By working together alongside the scientific community, we lay the foundation for the future of biomedical technologies."

New Undergraduate Minor in Brewing Innovation

Knight Campus academic programs continue to expand as Fall 2024 brings the launch of a new undergraduate minor in Brewing Innovation. The program will debut its first course in the series, BRIN 221: Tapping Into the World of Beer. This hands-on class will explore the science and art of beer's sensory experience. Students in the program will also take courses in the history and future of brewing innovation, an advanced brewing laboratory, and finish their studies with an interdisciplinary capstone in beer design.

Why Brewing Innovation?
Innovation is a valuable, transferable skill in any field. The Brewing Innovation minor uses the brewing process as a backdrop to teach innovation, emphasizing design thinking. Design thinking involves understanding customer needs, generating ideas, prototyping solutions, and refining them iteratively. The minor integrates science, history, and storytelling, offering an interdisciplinary approach.

What Students will Learn
Students will gain practical brewing skills while exploring the historical context of innovation and learning how to communicate ideas effectively. The capstone course will provide an immersive innovation experience, combining their major discipline with the brewing knowledge gained.

The minor's brewing activities take place in the Knight Campus' Fermentation Innovation Lab, equipped with a 1-barrel electric brewing system and smaller setups for experimental brewing. The lab also includes fermenters, glycol-based chilling units, an analytical laboratory, a cold room for beer storage, and a servery for educational tastings.

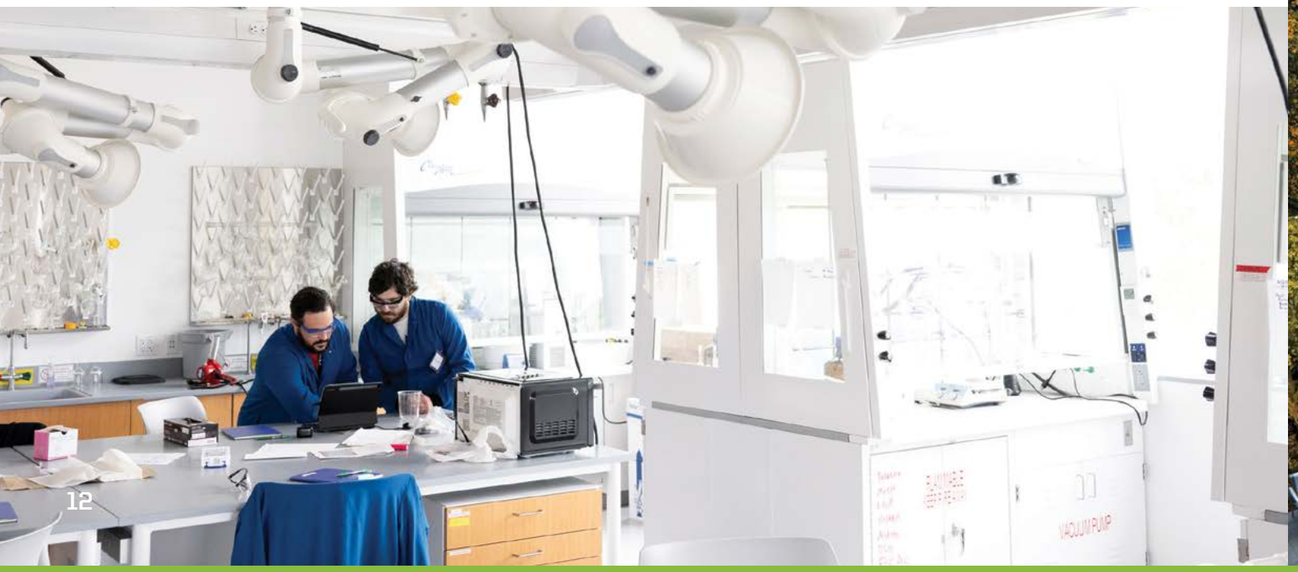
Knight Campus to Play a Role in Expanding Big Ten Cancer Research Consortium

The University of Oregon's (UO) recent inclusion in the Big Ten Conference opens the door for its participation in the Big Ten Cancer Research Consortium (Big Ten CRC). This consortium, founded in 2013, unites cancer centers across Big Ten universities to collaborate on multi-institutional cancer research. Researchers from member institutions work together in Clinical Trial Working Groups to launch studies aimed at combating cancer, with support from industry and philanthropic funding.

The Knight Campus will serve as a hub for UO's involvement in the consortium, leveraging programs like the Center for Biomedical Data Science, a collaborative effort between UO's Knight Campus and OHSU's Knight Cancer Institute. This joint initiative brings top-tier expertise to drive research and innovation.

In an announcement posted to the Big Ten Cancer Research Consortium website, Knight Campus Executive Director Bob Guldberg expressed his enthusiasm for the multi-institutional partnership, noting the shared goal of advancing cancer research and patient care. "We are eager to team up with Big Ten researchers to attack our common enemy," Guldberg said. "This collaboration offers powerful opportunities to drive new scientific discoveries and mentor future research leaders."

MORE DETAILS: bigtencrc.org



Building Two on Track for Opening

Scheduled to open in 2026, the new building emphasizes engineering research and training with amenities that include a student maker space for students to learn, prototype, and test their inventions. It is expected to house 20-23 research groups focused on bioengineering and biomedical computational science.

Image by MIR, courtesy of ZGF Architects

Genomics in Action: Ten Years of Learning and Growing

Presented by the Knight Campus Graduate Internship Program (KCGIP), the 10th annual Genomics in Action conference drew more than 130 attendees to the Knight Campus in February, along with an estimated 80 virtual participants. "The tenth year of the conference was all we could have hoped for," said Leslie Coonrod, director of the KCGIP Bioinformatics and Genomics Track. "From the beginning, this conference was about facilitating connections: between students, alumni, partners, and the scientific community. We saw those connections in action this year."

Genomics in Action is most closely tied to Bioinformatics and Genomics, one of five tracks in the KCGIP, but is open to everyone. The event launched more than a decade ago as the Big Data Meeting and was marketed as "Big Opportunities with Big Data." Lots has changed since then, and this year's event provided an opportunity to look back and project forward into the future. Assistant Vice President Stacey Wagner recalled how the track was created to provide students with essential skills in next-generation sequencing, which fulfilled industry needs while offering trainees cutting-edge expertise.

A major goal of the conference was to connect students with industry leaders and provide feedback to help the KCGIP curriculum evolve. Students showcased their skills and research through poster and networking sessions, offering prospective students a glimpse into the program. "The growth of our students is incredible to see," said Maxine Wren, a KCGIP faculty member. "This event gives us a chance to celebrate the success of our current students and alumni and create future collaboration opportunities."

Alumni were heavily involved, with 40 attending in person, many participating as speakers or mentors. 2020 alumna Anastasiya Primolenna expressed her enthusiasm for the event, calling it her "favorite time of the year" to connect with fellow bioinformatics enthusiasts and spark new ideas.

While the conference highlighted cutting-edge advancements in genomics, such as multi-omic approaches, mass spectrometry, and DNA aptamer-based protein detection, its heart remains focused on the growth and success of students and trainees, helping them forge meaningful connections with industry and advance their careers in bioinformatics.

Knight Campus Graduate Internship Program (Master's)

ACADEMIC YEAR 2023-2024

2024 Master's Student Graduates	74
2023 Graduates Placed/Hired in Industry (w/in 3-mos. of graduating)	68 (86%)
New Recruits for Summer 2024	89

KCGIP Prepares Students to Be Future Leaders

The Knight Campus Graduate Internship Program (KCGIP) welcomed its latest academic cohort of 89 students in June. The nationally recognized accelerated master's program offers specializations in bioinformatics, molecular sensors and biotechnology, optics, polymers, photovoltaics and semiconductors, all of which are designed to meet the technology needs of industrial, academic, clinical, and national labs.

Professional Development and Orientation Week precedes the start of the cohort's immersive technical coursework and is focused on building community and cultivating strong professional relationships, while introducing students to a breadth of leadership topics. These themes are continued throughout the duration of the program and emphasized in KCGIP's annual Inclusion Symposium held in August.

This year's Inclusion Symposium featured André Isaacs as the event's keynote speaker. Isaacs is an associate professor at the College of the Holy Cross and a passionate advocate for inclusivity in science. Known for his innovative use of pop culture and dance to engage students, particularly through his vibrant content on TikTok, Isaacs has become a powerful voice for diversity in STEM fields. Isaacs spoke to KCGIP students and other symposium attendees about using their voices in their careers. The symposium also included student speeches, panel discussions, and a networking reception, all designed to support student success and fulfillment in their future careers.

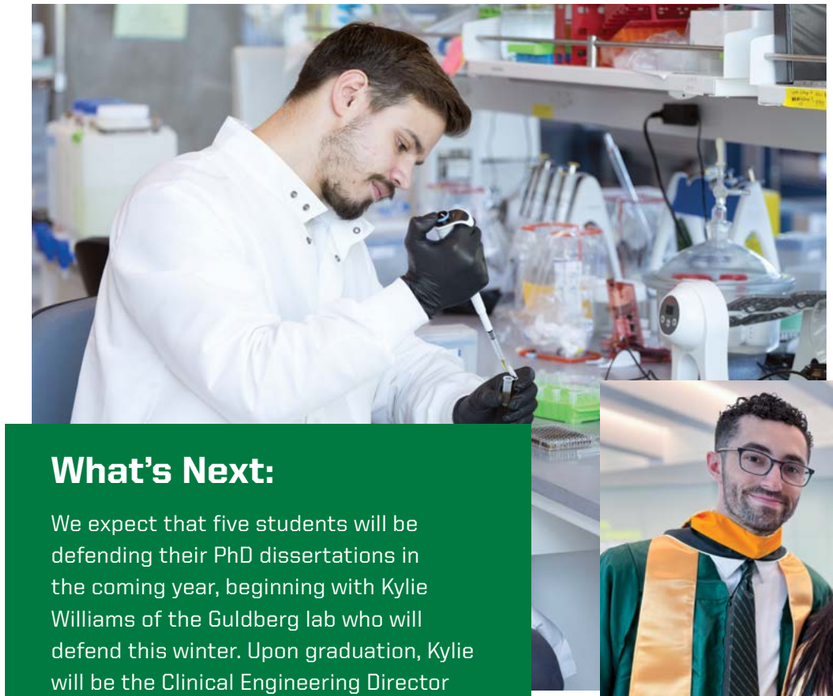
Bioengineering Welcomes New PhD Cohort

The Knight Campus is excited to welcome its newest PhD students in the fall term of the 2024-25 academic year, launching the fifth cohort for the Department of Bioengineering. This dynamic group includes students from Oregon, across the U.S., and around the world, each bringing diverse backgrounds and fresh perspectives to the program.

The students kicked off their journey with Impact Week, the department's signature orientation and training program. This intensive five-day series of workshops provides essential skills in science communication, innovation, and entrepreneurship, setting the stage for their success as applied scientists and engineers.

With hands-on learning opportunities and a focus on innovation, these students will develop key skills in communication, entrepreneurship, and design thinking, preparing them for success in both academic and professional arenas.

2024 PhD Cohort: above, from left to right, David Dzamesi from Kwame Nkrumah University of Science and Technology, Andy Huang from Dalhousie University, Anika Moorjani from Georgia Institute of Technology, Elizabeth Amponsem from the University of Ghana, Samantha Watson from North Carolina State University, Ben Burress from the University of Oregon, and Russell McLoughlin from the University of California at Santa Barbara.



What's Next:

We expect that five students will be defending their PhD dissertations in the coming year, beginning with Kylie Williams of the Guldberg lab who will defend this winter. Upon graduation, Kylie will be the Clinical Engineering Director for Penderia Technologies, Inc. She will work with scientific teams to facilitate the development and commercialization of implantable sensors for orthopedic applications. She will also help identify product development features and the clinical data necessary to achieve key commercialization milestones. We look forward to celebrating several successful PhD completions this year.

Congratulations, Graduates!

The Knight Campus hosted an Open House on June 17, 2024, celebrating all 121 of its graduates, which included seven students receiving bioengineering minors – the first students to graduate with any type of engineering specialization from the University of Oregon.

Knight Campus Department of Bioengineering

ACADEMIC YEAR 2023-2024

Total Enrolled PhD Students – Spanning 4 Cohorts	34
2024 Master's Student Graduates	1
PhD Students Supported by Competitive External Fellowships	7 (of 34)
New PhD Recruits for Fall 2024	7
Undergraduate Minor Students	42

Knight Campus Undergraduate Scholars

The Knight Campus Undergraduate Scholars Program pairs promising undergraduates with research mentors – graduate students, postdocs, and faculty members – immersing them in a 12-month, comprehensive research experience in Knight Campus-affiliated labs.

These young scientists are taking on independent research projects in a diverse set of fields and connecting with mentors throughout the Knight Campus and across the UO. This year's cohort is approximately 38% sophomores, 57% juniors and 5% seniors with an average GPA of 3.91. Here are some other statistics about this year's group of outstanding, next generation researchers:

- Gender: 42.9% Male; 47.6% Female; 9.5% Non-binary
- Ethnicity: 47.6% students of color; 47.6% white; 4.8% did not disclose
- 9.5% are first-generation
- 19% are transfer students
- 47.6% are enrolled in the Clark Honors College
- 71.4% are Oregon residents (graduated from an Oregon High School)

"The KCUS program provides a unique opportunity to immerse myself in the research I am most interested in. The most rewarding part of science is being able to apply my knowledge to a practical setting. With this program, I am applying my passions for biology and engineering to the future of medicine... It is a great privilege to start my bioengineering career at the state-of-the-art Knight Campus."

– Brock Cottle
Seeyan Lam Undergraduate Scholar
Class: Junior, **Major:** Biology
Minors: Bioengineering and Chemistry
Mentor: Tim Wheeler, **Lab:** Lindberg Lab

Inspiring the Next Generation

The Knight Campus is dedicated to training the next generation of applied scientists, with students and scholars taking an active role in outreach efforts to inspire local youth.

In November, Tayler Hebner, a postdoctoral scholar in the Benoit Lab, organized "Engineering Tomorrow's World: Girls Leading the Way," an event aimed at girls in grades 1-3 and their female relatives. The event included hands-on projects for the girls and a panel discussion for guardians on how to nurture their daughters' interest in STEM. Ten female Knight Campus PhD students and postdocs volunteered. "We want to provide opportunities like this as early as possible and resources for (the girls) to continue engaging so that the door to a STEM career opens for them and it never closes," Hebner said.

In May, bioengineering trainees David Frey and Tyler Guyer presented at the monthly "Meet a Scientist" event at the Eugene Science Center. Billed as an opportunity to meet scientists from the community, learn about their exciting research, and ask questions, the monthly event aligns with the center's mission of inspiring scientific curiosity and fostering critical thinking. "I am extremely excited to teach the community about hydrogels and how they are leveraged in bioengineering research," said Frey. "I think 'Meet a Scientist Day' will be a great opportunity to not only spark the love for science in the eyes of young students, but to also enhance the impact of Knight Campus research through community engagement."

The Knight Campus Graduate Student Association also contributed to the UO's Summer Academy to Inspire Learning (SAIL). Graduate students led scientific modules and building tours for over 25 high school students, aiming to introduce them to bioengineering and spark curiosity about the field.

Five Bioengineering PhD Students Awarded NSF Fellowships

Five PhD students from the Knight Campus Department of Bioengineering have been awarded prestigious Graduate Research Fellowships from the National Science Foundation. The NSF Graduate Research Fellowship Program (GRFP) is considered the gold standard in graduate research fellowships and is only handed out to about 2,000 students nationwide.

Fellowships went to David Frey, Phillip Hernandez, Nicholas Pancheri, Iman von Briesen and Malley Gautreaux. PhD students DeShea Chasko and Rose Hulsey-Vincent received honorable mentions, which are awarded to meritorious applicants and considered a significant national academic achievement. Each recipient will receive three years of financial support, as an annual stipend of $37,000.

“It’s an incredible and well-deserved honor to receive the NSF GRFP,” said Danielle Benoit, Lorry Lokey Chair of the Department of Bioengineering. “We congratulate all of this year’s recipients and honorable mentions.”

Advisors and support teams play an important role in the GRFP process. Frey is advised by Marian Hettiaratchi, Hernandez by Bob Guldberg and Danielle Benoit, Gautreaux and Chasko by Gabriella Lindberg, Hulsey-Vincent by Tim Gardner, Pancheri by Bob Guldberg and Nick Willett and Von Briesen by Paul Dalton. The Knight Campus Impact Team, which includes Mark Blaine, Jim Hutchison, Nathan Jacobs, Andrew Nelson, Stacey York, and Annie Zeidman-Karpinski, supported the application process.

This year’s awardees join three previous Department of Bioengineering GRFP recipients Kaylee Meyers (2023), Jarod Forer (2022) and Yan Carlos Pacheco (2021).

A Year of Honors for Knight Campus Students and Postdocs

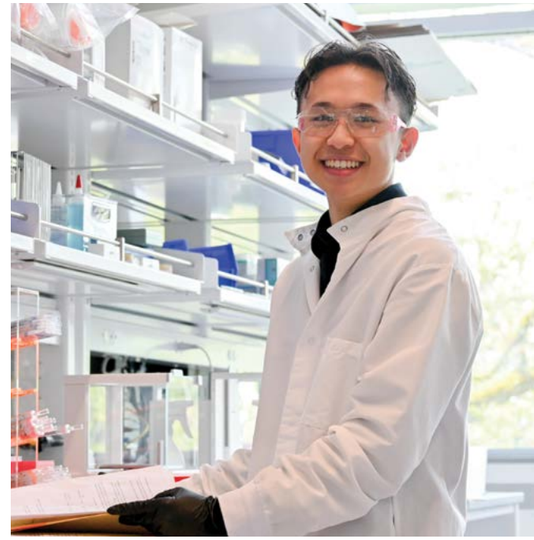


Photo credit: Jack White

Clark Honors College (CHC) senior **Ethan Dinh**, a computer science major and undergraduate research assistant in the Guldberg lab, took home the first-place title in the CHC Three Minute Thesis Competition in April. His topic, “Proteomic Signatures of Tibial Bone Stress Reinjury,” showcased his study of fractured leg bones in recreational women athletes, focusing on how measuring the bone density of women who had previous fractures of the tibia and conducting a biomarker analysis on their blood can help predict future fractures.

Knight Campus biochemistry PhD candidate **Justin Svendsen** was awarded an F31 NRSA fellowship from the NIH National Heart Lung and Blood Institute for his project, “Development of Affinity-Based Delivery Systems for Angiogenic Growth Factors.” The $145,000 award will fully fund Svendsen’s research for three years, supporting his exploration of how tunable, sequential delivery of growth factors can better stimulate natural healing processes.

Sanique South, a postdoctoral scholar in the Nick Willett lab, received both the Translational Science Research Award and the 2024 Women in Nephrology Research Award while attending the Network of Minority Health Research Investigators (NMRI) Annual Workshop. South is currently developing new regenerative medicine approaches to treat osteoarthritis.

A **Knight Campus student research team** earned a silver prize and was nominated for the Best Software Award while competing at the iGem 2023 Grand Jamboree in Paris. Teams were judged on their ability to design, build, and test projects using cutting edge synthetic biology. The Knight Campus team competed in the Therapeutics category with a project to create a living therapeutic in the form of an engineered probiotic, utilizing a wide variety of molecular biology and genetic engineering techniques. The interdisciplinary team was mentored by graduate students in the Plesa Lab, the Hettiaratchi Lab and the Hosseinzadeh Lab.

CENTERS OF EXCELLENCE

Wu Tsai Human Performance Alliance

Alliance at Oregon Goes Global

The Wu Tsai Human Performance Alliance at Oregon supports research across the University of Oregon and partners with five institutions nationwide. Oregon researchers are also extending their work globally, connecting with international scientists and students to improve human health and performance. Here's how the Alliance at Oregon is expanding worldwide:

The Tunisia Connection
The Alliance at Oregon has developed strong ties with Tunisia, including hiring Tunisian staff and students. In 2021, Mike Hahn, human physiology professor and associate director of the Alliance at Oregon, hired Aida Chebbi, a Tunisian research engineer, focused on sports injury prevention. In October 2022, Hahn and Chebbi attended a biomechanics conference in Tunisia, leading to a collaboration with Tunisian students. Six student trainees now work with the Alliance, with some traveling to Oregon and others contributing remotely.

Biomechanics Conferences in Japan
In mid-2023, an Alliance-affiliated team attended two biomechanics conferences in Japan. Aida Chebbi, Ph.D. students, and visiting scholar Masataka Yamamoto presented research on sports biomechanics, including studies on soccer cleat design and its impact on injury prevention. Emily Karolidis was a finalist for the Nike Footwear Research Award at one of these events.

Termis-AP Conference in Hong Kong
In October 2023, Bob Guldberg, director of the Alliance at Oregon, presented at the Termis-AP Conference in Hong Kong. His keynote lecture covered recent advances in musculoskeletal regenerative rehabilitation, highlighting the intersection of immune biology and mechanobiology.

Partnership with Loughborough University
The University of Oregon and Loughborough University are aligned through the Wu Tsai Alliance and cofounded the Global Sports University Network (GSUN). GSUN aims to advance sports-related research globally with a commitment to joint student training and research exchanges. The inaugural GSUN international summit was hosted by the Knight Campus this September, drawing experts from six continents and 21 countries, collaborating around the theme of inclusivity.

The Alliance's global expansion continues with upcoming projects in China, Japan, and Monaco, among other countries.

Cresko Appointed Director of UO's Center for Biomedical Data Science

This spring, the University of Oregon (UO) announced the appointment of Bill Cresko as the new director of its Center for Biomedical Data Science, a key initiative within the Phil and Penny Knight Campus for Accelerating Scientific Impact. This center represents a collaborative venture with Oregon Health & Science University (OHSU) aimed at harnessing the power of biomedical data science to combat severe diseases caused by cellular dysfunction, such as cancer. Located within the Knight Campus and supported by a $10 million gift from Mary and Tim Boyle, the center will be a cornerstone of this effort.

In his new role, Cresko, who holds the Lorry Lokey Chair and is a professor of bioengineering, will spearhead UO's contributions to the joint center. He emphasized the significance of this collaboration, stating, "Together we are building a bridge between the Knight Campus and the Knight Cancer Institute, integrating our complementary strengths, enhancing student training in biomedical data science, and fostering industry partnerships that benefit society."

The UO Center for Biomedical Data Science is expected to relocate to the new Knight Campus Building 2, which is slated to open in early 2026. Cresko's vision includes developing innovative "multi-omics" approaches that combine various data collection and analysis tools, including machine learning, to advance the study of health and disease. "Cells constantly communicate through various signals," Cresko explained. "Our goal is to 'listen in' on these interactions to detect and treat diseases more effectively and efficiently."

A distinguished member of the UO Institute of Ecology and Evolution, Cresko is well-positioned to link the Knight Campus with UO's researchers in biological sciences and the newly established School of Computer and Data Sciences. He previously founded the Genomics and Bioinformatics program, now part of the Knight Campus Graduate Internship Program, and served as executive director of UO's Presidential Initiative in Data Science. His research focuses on using quantitative genomics to explore how genetic variations influence gene and protein networks, impacting evolutionarily significant traits and human diseases like cancer.

Cresko will collaborate closely with Sadik Esener, interim director of OHSU's program, along with scientific co-directors Xubo Song and Emek Demir. Their initial priorities include advancing research in image analysis using artificial intelligence, applying single-cell biology techniques to disease studies, integrating new faculty, and developing supercomputing tools and large databases. They also aim to secure funding from the National Institutes of Health (NIH) to establish the center as a national hub for computational genomics and data science.

Looking ahead, Cresko and Esener will focus on recruiting faculty, refining research areas, and preparing a major grant proposal to create an NIH Center of Excellence. "We aim to foster strong collaboration with physicians and faculty across both OHSU and UO," Esener stated. "By leveraging each institution's strengths, we hope to accelerate our research and maximize our impact."

In addition to his directorship, Cresko will hold a faculty position in the Knight Campus Department of Bioengineering, where he will teach courses in biostatistics, machine learning foundations, and quantitative genomics for bioengineers. His role will also involve enhancing collaborations across the university's data science community.

"The Center for Biomedical Data Science will serve as a hub for integrating advanced quantitative and computational methods into research and training," Cresko concluded. "By building a bridge with OHSU, we will also enhance collaboration within the Knight Campus and across UO."

CTBR Adds Two Trainees

A partnership between PeaceHealth and the University of Oregon's Phil and Penny Knight Campus for Accelerating Scientific Impact, the Center for Translational Biomedical Research (CTBR) aims to forge biomedical research collaborations that produce increased research grant funding, journal publications and translation of new medical technologies. Postdoctoral fellowships for candidates from underrepresented communities in science and engineering mark the center's first effort. Two trainees were added this year to the initially funded projects – Sanique South in the Willett Lab and Vignesh Rangasami in the Benoit Lab.

Innovation Center Celebrates Grand Opening

The Papé Family Innovation Center is making it easier and faster to translate academic research into patents, inventions, startup companies, and collaborations with industry. The center provides access to wet labs, tools and expertise through a leasing mechanism and active programming to support early-stage entrepreneurs and encourage industry engagement. And thanks to new venture funding through the UO's Launch Oregon initiative, we're putting together all the necessary pieces for a thriving innovation ecosystem. This year, the center opened to its first tenants, including the Knight Campus spinout company, Penderia Technologies.

Knight Campus Faculty

DANIELLE BENOIT
Professor and Lorry Lokey Chair of the Department of Bioengineering
Research focuses: Engineered extracellular matrices for tissue mimetics and tissue regeneration, targeted drug delivery nanotechnologies

BALA AMBATI
Research Professor
Research focuses: Drug delivery, gene therapy, bioimaging

BILL CRESKO
Lorry Lokey Chair, Professor, and Director, Center for Biomedical Data Science
Research focuses: Computational genomics, host-microbe interactions, gene regulatory systems

PAUL DALTON
Associate Professor, and Bradshaw and Holzapfel Research Professor in Transformational Science and Mathematics
Research focuses: Advanced manufacturing, high-resolution 3D printing, biofabrication

FELIX DEKU
Betsy and Greg Hatton Assistant Professor
Research focuses: Microelectrodes, thin-film devices, neural recording and stimulation

TIM GARDNER
Associate Professor, and Robert and Leona DeArmond Chair in Neuroengineering
Research focuses: Vocal Learning, deep neural networks

ROBERT GULDBERG
Professor, and Vice President and Robert and Leona DeArmond Executive Director
Research focuses: Musculoskeletal mechanobiology, regenerative medicine, orthopedic medical devices

MARIAN HETTIARATCHI
Assistant Professor
Research focuses: Controlled protein delivery to injured tissues, affinity-based biomaterials, cell-instructive biomaterials for bone repair

PARISA HOSSEINZADEH
Assistant Professor
Research focuses: Naturally occurring peptides, protein-based sensing platforms, biosensors for detecting pollutants

GABRIELLA LINDBERG
Assistant Professor
Research focuses: Bioinks for tissue engineering, 3D-bioassembly, personalized 3D tissue models

KEAT GHEE ONG
Professor
Research focuses: Implantable and wearable devices, wireless sensor technologies, magnetoelastic materials

CALIN PLESA
Assistant Professor
Research focuses: Large scale protein engineering and characterization, sequence-function relationships, multiplex functional assays

NICK WILLETT
Associate Professor
Research focuses: Cell therapies, multi-scale mechanical regulation of bone regeneration, intra-articular therapeutic delivery

RESEARCH
AND AWARD
HIGHLIGHTS

Danielle Benoit Inducted as a National Academy of Inventors Fellow

Danielle Benoit, Lorry Lokey Chair of the Knight Campus Department of Bioengineering was officially inducted as a fellow of the National Academy of Inventors during a June 18 ceremony at the organization's annual meeting in Raleigh, North Carolina.

The honor recognizes her contributions to the field of biomedical engineering. An expert in the development of therapeutic biomaterials, Benoit is an NIH- and NSF-funded researcher, whose work has provided insights into the translation of tissue engineering strategies for bone healing and the development of tissue models to discover new drugs and drug delivery systems.

"As someone who has always loved designing and building things to make them better and more beneficial to society, it's a great honor to be recognized by the National Academy of Inventors," Benoit said. "I'm motivated in my research to improve people's lives and it means a great deal to join the academy with so many remarkable innovators."

Benoit joined the Phil and Penny Knight Campus for Accelerating Scientific Impact at the UO in 2022. She was previously the William R. Kenan Jr. Professor of Biomedical Engineering and Director of the Materials Science Program at the University of Rochester. She was nominated by Stephen Dewhurst, Rochester's Vice President for Research. At the UO, Robert Guldberg, Vice President and Robert and Leona DeArmond Executive Director of the Knight Campus, recruited Benoit to the UO to serve as the inaugural chair of the Department of Bioengineering.

"For those of us who know Professor Benoit, this recognition comes as no surprise. Her relentless pursuit of excellence in training, teaching, research, and entrepreneurial activities, attracted our eye when we hired her to lead the Department of Bioengineering," Guldberg said. "This well-deserved recognition reminds us of all the ways she has already made an impact on the world in her career through her remarkable innovations in tissue engineering, bone regeneration, drug delivery, and other inventions in the field of therapeutic biomaterials."

At the time of her nomination, Benoit held twelve fully executed US patents and thirty-eight foreign patents that cover seven distinct inventions (patent families) that have been licensed to four companies (PhaseRx, Genevant Sciences GMBH, Johnson&Johnson, and Taithera). She also has five US provisional patents and two invention disclosures pending submission.

National Academy of Inventors

The National Academy of Inventors was founded in 2012 to recognize and encourage inventors with U.S. patents, enhance the visibility of academic technology and innovation, encourage the disclosure of intellectual property, educate and mentor innovative students, and translate the inventions of its members to benefit society.)

RESEARCH
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HIGHLIGHTS

Deku Awarded Named Professorship

Felix Deku is pioneering advancements in neural interface technologies in the Department of Bioengineering. His work holds promise for treating conditions like vision impairment, epilepsy, Parkinson's disease, paralysis, and more. As the first recipient of the Betsy and Greg Hatton Assistant Professorship of Neuroengineering, Deku's ability to explore innovative ideas will be significantly enhanced.

"I am deeply humbled and honored to receive this professorship and immensely grateful to the Hattons for their generous support and belief in my research," Deku stated. "This role is both a privilege and a responsibility, and I look forward to furthering the growth of neuroengineering in their names."

Deku's team specializes in developing small microelectrodes that can simultaneously record and stimulate neuron activity. Neurons transmit signals rapidly, and disruptions in this process are linked to disorders like epilepsy and Parkinson's. Deku's microelectrode interfaces can precisely deliver localized electrical stimulation to reactivate neurons that are inactive or malfunctioning. This approach could reduce the side effects commonly associated with current neurostimulator implants.

At the Deku Lab, researchers rigorously test materials like silicon carbide and polymer films to ensure compatibility with brain neurons. Their goal is to develop implants that seamlessly integrate with the nervous system, improving their effectiveness in recording and stimulating electrical activity. These advancements hold promise for a wide range of disorders that currently lack long-term, effective treatments.

The three-year Betsy and Greg Hatton Assistant Professorship, established by UO alumni Betsy and Greg Hatton, provides Deku and his lab with financial resources to continue advancing neural interfaces. "We are proud to support the work of Dr. Deku and his team," Greg Hatton remarked, adding that collaboration within the bioengineering community is crucial to finding life-changing solutions.

This professorship not only acknowledges Deku's past contributions but also underscores the potential for future breakthroughs in neuroengineering.

Deku was recently awarded a $2.19 million NIH R01 grant, which will be allocated over three years. His project aims to revolutionize how brain activity is monitored and improve treatments for neurological disorders.

Guldberg Featured as TEDxPortland Speaker

On April 27, Knight Campus Executive Director Bob Guldberg presented his talk, "Listening to Our Cells," at TEDxPortland. The first University of Oregon faculty member to give a TEDxPortland talk since the UO became a title and presenting sponsor, Guldberg discussed his research involving the search for an early predictive signature for poor healing outcomes and the model he helped develop to predict trauma outcomes one week post-injury. His breakthrough research in the field of musculoskeletal regenerative medicine is helping patients with traumatic injuries and osteoarthritis better predict how their bodies will heal, develop the most effective treatment plans, and have the best possible quality of life.

"What if we could listen to what the 37 trillion cells in our bodies are saying and use the information to create a 'weather report' of sorts to predict healing after injury?" Guldberg asked. "What if cells in our blood could tell doctors if we will heal after injury?"

Guldberg joined 11 other speakers ranging from behavioral economist Melina Palmer to James Beard Award-winning chef Gabriel Rucker to multi-platinum indie rock band Modest Mouse at Portland's Keller Auditorium. "Alchemy" was the theme of the event, which organizers say was inspired by "the unlimited potential and endless possibilities revealed through the alchemy of ideas."

WATCH: www.tedxportland.com

RESEARCH
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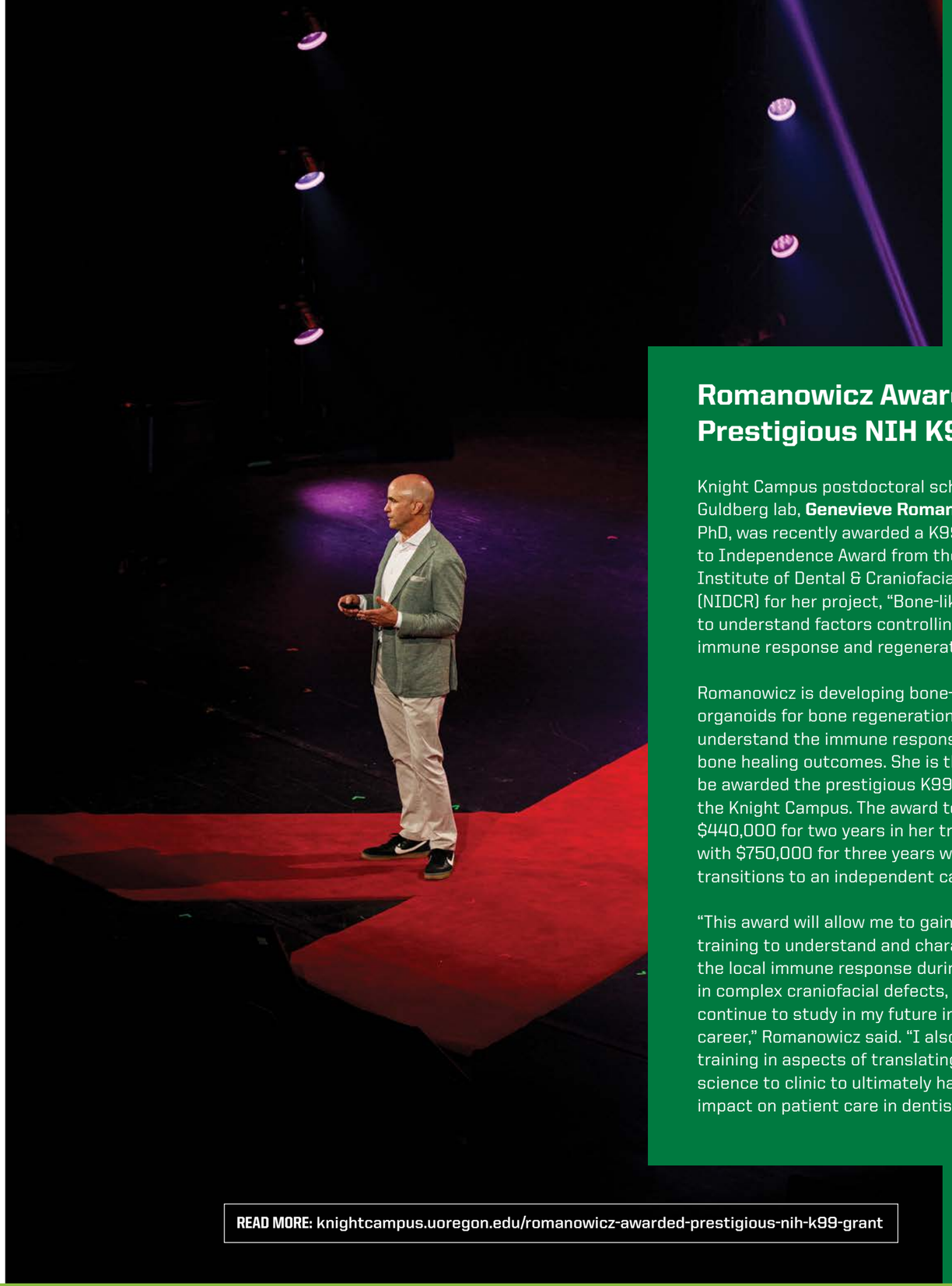

Romanowicz Awarded Prestigious NIH K99 Grant

Knight Campus postdoctoral scholar in the Guldberg lab, **Genevieve Romanowicz**, DDS, PhD, was recently awarded a K99 Pathway to Independence Award from the National Institute of Dental & Craniofacial Research (NIDCR) for her project, "Bone-like organoids to understand factors controlling local bone immune response and regeneration."

Romanowicz is developing bone-like organoids for bone regeneration and to better understand the immune response to improve bone healing outcomes. She is the first to be awarded the prestigious K99 award at the Knight Campus. The award totals over $440,000 for two years in her training phase with $750,000 for three years when she transitions to an independent career.

"This award will allow me to gain additional training to understand and characterize the local immune response during healing in complex craniofacial defects, which I will continue to study in my future independent career," Romanowicz said. "I also will gain training in aspects of translating bench science to clinic to ultimately have a bigger impact on patient care in dentistry."

READ MORE: knightcampus.uoregon.edu/romanowicz-awarded-prestigious-nih-k99-grant

Hettiaratchi Honored with UO and National Awards

Bioengineering Assistant Professor Marian Hettiaratchi was included in the University of Oregon's Outstanding Research Awards this year, recognizing excellence in research for both tenured and early-career faculty; career faculty; efforts to broaden diversity, equity, and inclusion; and particularly innovative and impactful methods.

Hettiaratchi received the Early Career Award which is the UO's highest award for early career faculty to recognize and celebrate an emerging and significant record of scholarship and research on our campus. She is honored for her stellar work in bioengineering of proteins and research aiming to address significant gaps in current protein therapeutics with applications ranging from spinal cord injuries to bone regeneration.

Her nominator pointed to a long list of Hettiaratchi's achievements including the Emerging Investigator Award for the Journal of Materials Chemistry B, the 2023 Rising Star for the journal Advanced Healthcare Materials, an NSF CAREER Award, and additional NIH awards, "extraordinary accomplishments for someone so recently established in an independent research career."

The accolades continued this year for Hettiaratchi when she received the 2024 Tissue Engineering and Regenerative Medicine International Society, Americas Chapter (TERMIS-AM) Young Investigator Award, presented at the 7th TERMIS World Congress in Seattle in June.

RESEARCH
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Hosseinzadeh Recounts her Road to Recovery from ICU to Lab in *Nature*

Knight Campus Department of Bioengineering Assistant Professor Parisa Hosseinzadeh was eight months pregnant and doing her daily yoga in November 2022, when she developed a severe headache. Her husband Amir called emergency services, but she soon lost consciousness.

Hosseinzadeh had a brain bleed and was transferred from the local emergency department in Eugene to a neurological intensive-care unit in Portland. That night, surgeons drilled a hole in her skull and inserted a tube to relieve the pressure. She spent a month there, which ended when her baby was born through a caesarean section.

"My baby was healthy, beautiful and full of joy, and two weeks later we returned home," Hosseinzadeh writes. "But my medical issues were far from over."

In a powerful first-person piece that appears in the recent edition of the journal Nature, Hosseinzadeh recounts her experience and her long road to recovery. She is currently working two days a week and plans to increase gradually to a full-time schedule in the Knight Campus.

"Is it hard? Yes," Hosseinzadeh writes. "Do I sometimes think it might not happen? Yes. But, with my friends, family and colleagues, we have come this far, and we will finish strong."

READ THE ARTICLE IN NATURE: https://www.nature.com/articles/d41586-024-02413-6

Knight Campus Startup Penderia Receives $1.7 Million Grant

The Knight Campus spinout company Penderia Technologies has received a $1.74M Small Business Innovation Research (SBIR) Phase II Award from the National Institutes of Health (NIH). The award will enable the team to further develop its implantable wireless sensor technology, licensed from the University of Oregon.

Co-founded in 2020 by Knight Campus Professor Keat Ghee Ong, UO Vice President and Robert and Leona DeArmond Executive Director Bob Guldberg, research associate Salil Karipott, and Ken Gall from Duke University, the company is an orthopedic implant technology startup aiming to use real-time data to better monitor injury and healing progress. Ong now serves as Penderia Chief Technology Officer and Karipott as Chief Science Officer. Other core members include CEO Stephen Laffoon, Chief Research Officer Michael McGeehan and Director of Engineering Fraser Sanderson.

“We’re incredibly grateful to our research and development team and to our many supporters for the initial successes we’ve enjoyed,” Ong said. “Their backing enables our team to focus on commercializing our research and refining the innovative products Penderia will soon be known for.”

Penderia has also received funds from the UO Foundation’s new venture fund, Launch Oregon and successfully completed its first investor round, quickly surpassing their fundraising goal. The team is one of the first tenants in the Knight Campus’ Papé Family Innovation Center, which offers a mix of meeting spaces, wet lab benches, procedure rooms and other resources that researchers need to translate scientific discoveries into practical applications. A second center offering leaseable modules and more flexible spaces for different kinds of startups, will be housed in Knight Campus Building 2, which is currently under construction and due to open in early 2026.

Pointing to resources such as Launch Oregon, the Papé Family Innovation Center and other funding mechanisms for small businesses, Guldberg said a regional innovation network was emerging.

“Together, we are putting together the pieces that will comprise a West Coast innovation archipelago that extends from San Diego to San Francisco, to Eugene, Portland and Seattle,” Guldberg said.

Highlights & 5 Year Funding/ Expenditures

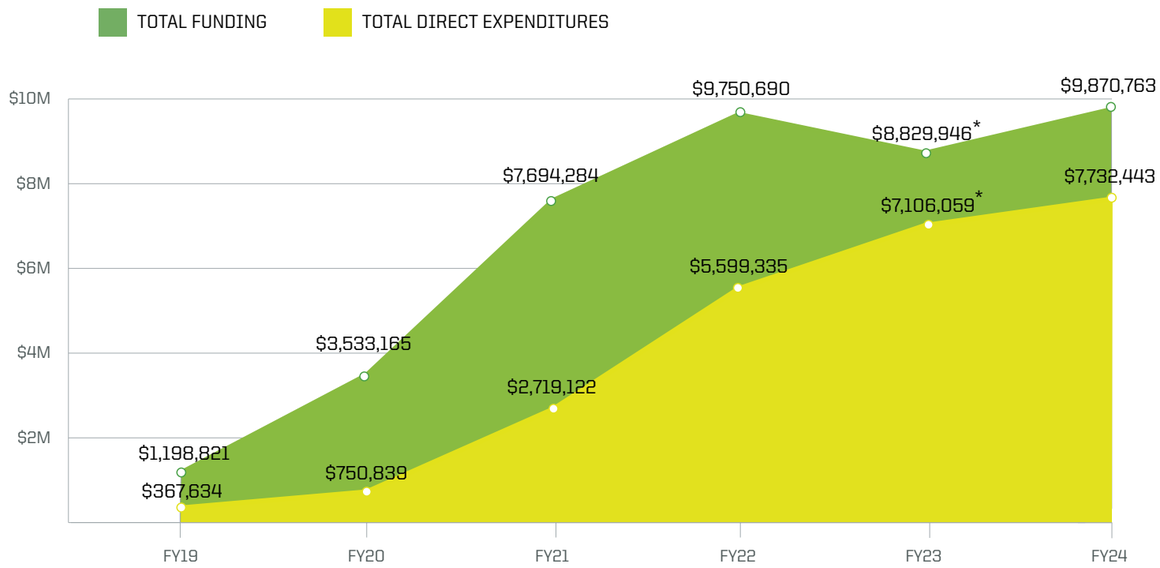
$71.5 M*

Cumulative Research Awards

* Includes known full award amounts, not just funding received to date, and currently goes out to FY30.

Total Number of Proposals Submitted	62
Total Number of New Awards	17
Total Funding Received – All Awards	$9,870,763
Total Direct Research Expenditures	$7,732,443
Total Number of Labs/PIs	12

Knight Campus 5-Year Research Funding and Direct Expenditures



*post FY23 report accounting revision

$10,104,000

in new gifts and pledges in FY24 – beyond the Knights' visionary philanthropy

$97,552,571

in total cumulative philanthropy (beyond Knight gifts) in support of Knight Campus research, academic and innovation programs, in gifts ranging from $3 to $35M.

Impact of Giving in 2024

- **One** Knight Campus Building 2 gift from Bill and Leslie Cornog, a challenge toward completing the $35M Knight Campus Phase 2 Capital Campaign, matched by a gift from Dennis and Janet Beetham to name the Tschache – Keana Skybridge over Franklin Boulevard.
- **21** Knight Campus Undergraduate Scholars, our largest cohort yet, all funded through philanthropic gifts.
- **A new endowment** from the Cameron/McDonald Family to support Innovation Topping Fellowships that celebrate Knight Campus graduate students who complete a specialization in Entrepreneurship and Innovation in the Lundquist College of Business – and seed funds from Jon and Terri Anderson to jumpstart this program [see example of impact, below].
- **One** new endowed professorship to help recruit/retain top scientific talent, named in memory of Lary Simpson, and one new associate professor in neuroengineering pledge, from Betsy and Greg Hatton, to amplify Felix Deku's research and development of next-generation neural interface devices.
- **Two** Petrone Innovation Faculty Fellowships, which will provide start-up capital to recruit faculty to the Knight Campus who have a strong track-record of commercializing scientific discoveries [see more detail, right].

"This fellowship means more to me than classes; it means taking the first crucial step to reach my post-PhD goals."

– Kylie Williams

Kylie Williams, bioengineering doctoral candidate, was not just the first Innovation Fellow in the Knight Campus. As part of the Knight Campus' first cohort of bioengineering PhD students, Kylie has helped build the program as she participated: she was hands-on with faculty from UO's Lundquist College of Business to develop the entrepreneurship and innovation specialization here – a first-ever offering of business courses for STEM students at the university – and, as a Chris Lee Innovation Fellow, has completed this coursework and gained insight into a career path that intersects biotechnology, business, and management. Following graduation, she will join Penderia, a Knight Campus start-up company, to develop biosensors to monitor healing from orthopedic injury.

Building the Bridge to Impact

$4-million gift supports UO's innovation, entrepreneurship efforts, Petrone Faculty Fellows

Dave and Nancy Petrone's partnership bolsters programming for student and faculty entrepreneurs and strengthens ties between the Knight Campus and Lundquist College of Business.

Nancy and David Petrone have been a force when it comes to investing in enhancing the reputation, programs, and leadership of the University of Oregon.

The couple's most recent gift is a reflection of their belief that the UO can be the preeminent engine for economic development in the region.

"We believe the University of Oregon needs to turn out students going into a business and launching startups—it makes the world go around," said Dave Petrone '66 (economics), MBA '68. "I see the Lundquist College and the Knight Campus as instruments for achieving significant growth and reputation enhancement in entrepreneurship and innovation."

Their gift is supporting a Petrone Entrepreneur in Residence who will focus on biotech ventures and be co-located between the Lundquist College and Knight Campus, working directly with Knight Campus innovators to help facilitate the commercialization of emerging technologies and discoveries. Another part of the gift will recruit Petrone Innovation Faculty Fellows in the Knight Campus.

"Petrone Fellows will be faculty scientists we recruit with a proven track-record of commercializing their discoveries, who will infuse their experience and entrepreneurial judgment at the UO," said Bob Guldberg, the Robert and Leona DeArmond Executive Director of the Knight Campus, and Vice President of the university. "Together with the Petrone Entrepreneur in Residence, Petrone Fellows will inspire and empower our young bioinnovators and help fuel them with the strategies and tools they need to support their entrepreneurial endeavors."

The Petrones are, Dave likes to note, people who invest in people—that could be scholarship recipients, faculty members, and program heads, for example. Entrepreneurs, he says, are special people.

"Entrepreneurship is a way of thinking—kind of the way I think," Petrone said. "Nancy and I believe we need to show up, as alumni and donors, and give to the areas that matter now. The university has made strides recently, but we need to keep pushing forward."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2025

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