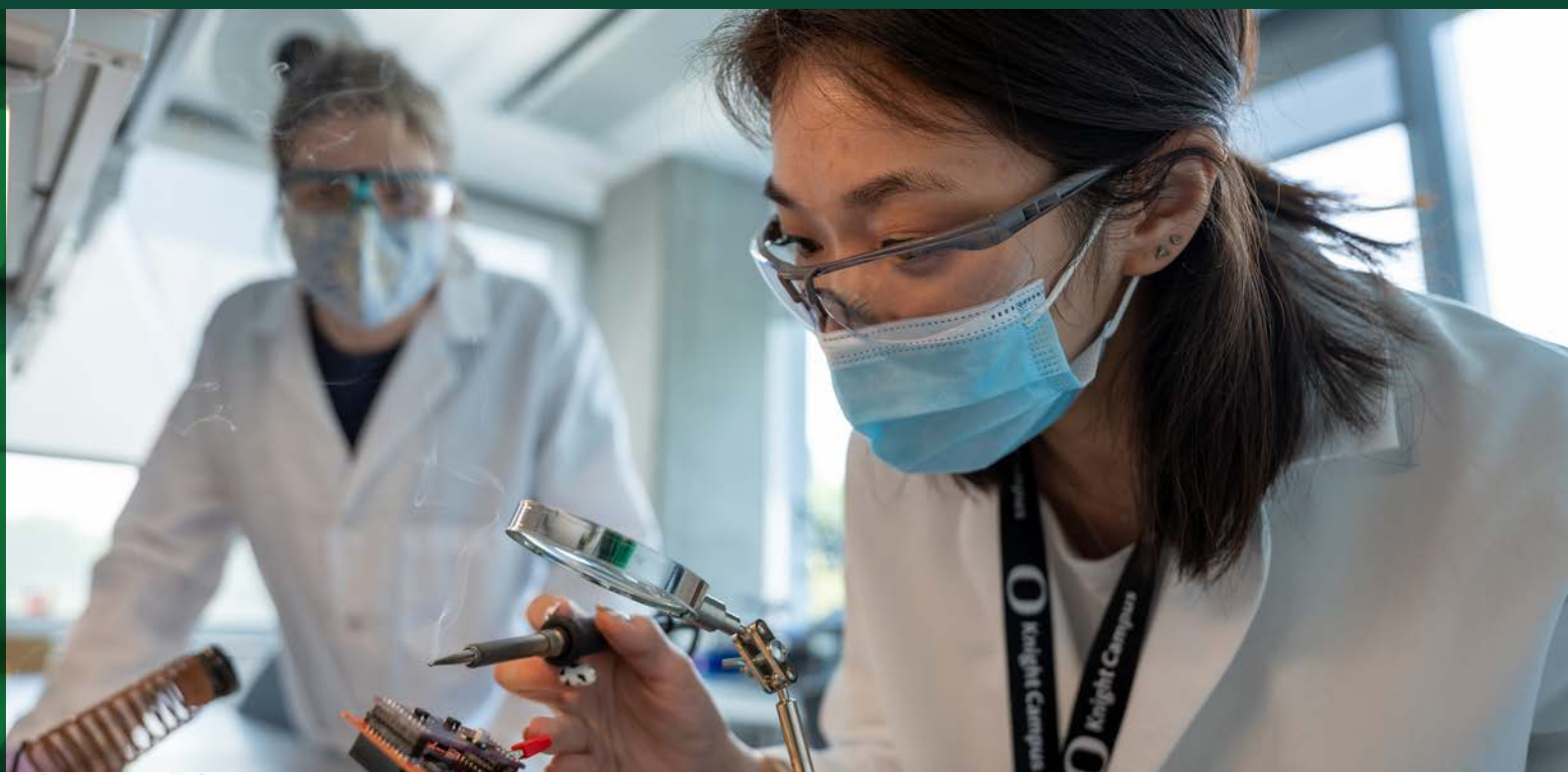
Phil and Penny Knight
Campus for Accelerating Scientific Impact



Annual Report: Fall 2021

UNIVERSITY OF OREGON

TABLE OF CONTENTS:

UNIVERSITY OF OREGON

A LETTER FROM ROBERT GULDBERG

What an amazing 12 months it's been at the Phil and Penny Knight Campus for Accelerating Scientific Impact.

Just a few months after we moved into and celebrated the grand opening of a new building, we announced a second gift of epic proportions from Penny and Phil Knight, enabling us to aspire to even greater heights.

The gift is an incredible vote of confidence from our donors, in large part of because what our amazing team accomplished since launching the Knight Campus in 2016. Much of their work came to fruition in the last 12 months, as we:

• Forged partnerships with amazing peer institutions around the country, including as a founding member of the Wu Tsai Human Performance Alliance, alongside Stanford University; Boston Children's, a Harvard Medical School Affiliate; the University of California San Diego; the Salk Institute for Biological Studies; and the University of Kansas.

• Doubled the size of our faculty, as we attract top-end talent from around the world.

• Had peer-reviewed work published across a gamut of highly regarded journals.

• Launched a bioengineering program and continued our successful accelerated master's degree program in areas of materials science, bioinformatics and genomics, with an emphasis on hands-on training.

• Continued very strong work with federal funding agencies; our early career faculty have been especially successful, with rare success on their first proposals.

• Forged new or deepened existing relationships with 73 faculty associates or affiliates.

• Engaged at various levels around the local community, including working with Kidsports to sponsor summer camps for youth on behalf of the Human Performance Alliance at Oregon.

In this report, you can read about those items in greater detail. Each of the efforts reflects inspiration of our benefactors, something we pay tribute to with the words of Phil Knight on the wall by an entrance to our first building.

"There is no finish line. That is our motto. Let everyone else call your idea crazy. Just keep going, don't stop."

Mr. Knight's words have become a motto for all of us at the Knight Campus. With this annual report, we detail a amazing progress from a single year. But I promise you that we're not stopping.

In fact, we are accelerating into a future that's never been brighter.

UNIVERSITY OF OREGON

FACULTY AND EXECUTIVE LEADERSHIP

Robert E. Guldberg, Vice President and Robert and Leona DeArmond Executive Director

accelerate.uoregon.edu/robert-guldberg

Following a national search, Robert Guldberg was hired in 2018 to lead the Knight Campus as its inaugural Executive Director and serves on the President's Executive Leadership team as Vice President of the University of Oregon. Engaging internal and external stakeholders, he led the creation of the Knight Campus Strategic Plan and has forged new partnerships with Oregon's research universities, health care providers and institutions around the country. He's overseen recruitment of the Knight Campus faculty and launch of the University of Oregon's first engineering degree program. A serial entrepreneur and internationally renowned bioengineer, Guldberg's research program devises new medical devices and regenerative therapies for musculoskeletal tissues damaged by traumatic injury or degenerative diseases such as osteoporosis and osteoarthritis.

Jim Hutchison, Senior Associate Vice President and Lokey-Harrington Chair in the Department of Chemistry and Biochemistry

https://accelerate.uoregon.edu/jim-hutchison

Jim Hutchison was a pioneer in green chemistry and green nanoscience. He has championed experiential graduate education in the UO's Graduate Internship Program. Hutchison founded the first center for green nanoscience, the Safer Nanomaterials and Nanomanufacturing Initiative of the Oregon Nanoscience and Microtechnologies Institute, a state signature research organization. He has co-authored several reports of the National Academy of Sciences on nanotechnology and green chemistry, has published more than 130 scientific papers and won numerous national awards.

FACULTY AND EXECUTIVE LEADERSHIP

Mark Blaine, Professor of Practice and Associate Director for Science Communication Research in Journalism and Communication

https://journalism.uoregon.edu/profile/mblaine

Mark Blaine has 20 years of experience working at the intersection of communication, science and technology. He has worked with partners and researchers on storytelling projects from a range of institutions, including the U.S. Forest Service, Vision Maker Media, the Institute for Sustainable Environment, and the Prince William Sound Science Center, as well as researchers from the University of Washington and Oregon State University. He takes an entrepreneurial approach to science storytelling, and as a Scripps Howard Entrepreneurial Journalism Institute fellow, he worked on developing and refining models for science-based stories.

Andrew Nelson, Associate Vice President of Entrepreneurship and Innovation and Randall C. Papé Chair in Entrepreneurship and Innovation

https://accelerate.uoregon.edu/andrew-nelson

Andrew Nelson received his PhD in Management Science and Engineering from Stanford University, where he subsequently served as a Lecturer. He also holds an MSc (with distinction) from Oxford University and a BA (with honors and distinction) from Stanford. His research explores the development and commercialization of technological innovations in fields ranging from biotechnology to digital music to green chemistry. An award-winning teacher, he also is the author of Technology Ventures: From Idea to Enterprise (McGraw-Hill), now in its 5th edition in multiple translations and used in entrepreneurship courses worldwide.

FACULTY AND EXECUTIVE LEADERSHIP

Moira Kiltie, Associate Vice President and Chief of Staff

https://accelerate.uoregon.edu/moira-kiltie

Moira Kiltie has spent nine years at New York University in the offices of the chancellor and provost. As assistant provost, she had broad budgetary, personnel, and analytic responsibilities. In 2004, she joined the University of Oregon, serving most recently as associate vice president for research and innovation and divisional chief of staff with supervisory responsibilities over research development services, sponsored projects services, research communications, research advancement, research finance and business administration, and the Undergraduate Research Opportunities Program. She joined the Knight Campus in September 2016.

Callie Johnston, Assistant Vice President for Development and Chief Development Officer

https://accelerate.uoregon.edu/callie-johnston
Knight Campus Giving: https://bit.ly/knight-campus-giving

Callie Johnston has a BA in English and Peace Studies from the University of Notre Dame and an MS in Public Service from DePaul University in Chicago. Prior to joining the Knight Campus, she spent 14 years in development at the University of Chicago, where she was most recently Senior Director of Principal Gifts in Medicine and Biological Sciences Development. In this role, she connected faculty who focused on cancer research, neuroscience, chemical biology, immunoengineering, community health/trauma, microbiome science, and basic science with individuals who were capable of making gifts of $5M or greater.

KNIGHT CAMPUS FACULTY BIOS

To get an idea of how Knight Campus researchers are focused on impact through biotechnology, here are links to their faculty bios:

Bala Ambati, Research Professor
accelerate.uoregon.edu/bala-ambati

Paul Dalton, Associate Professor
accelerate.uoregon.edu/paul-dalton

Felix Deku, Assistant Professor
accelerate.uoregon.edu/felix-deku
Slated to start at the Knight Campus in March 2022

Tim Gardner, Associate Professor and Robert and Leona DeArmond Chair in Neuroengineering
accelerate.uoregon.edu/tim-gardner

Marian Hettiaratchi, Assistant Professor
accelerate.uoregon.edu/marian-hettiaratchi

Parisa Hosseinzadeh, Assistant Professor
accelerate.uoregon.edu/parisa-hosseinzadeh

Gabriella Lindberg, Assistant Professor
accelerate.uoregon.edu/gabriella-lindberg
Slated to start at the Knight Campus in October 2021

Courosh Mehanian, Research Associate Professor
accelerate.uoregon.edu/parisa-hosseinzadeh

Keat Ghee Ong, Professor
accelerate.uoregon.edu/keat-ghee-ong

Calin Plesa, Assistant Professor
accelerate.uoregon.edu/calin-plesa

Jonathan Reeder, Assistant Professor
accelerate.uoregon.edu/jonathan-reeder

Nick Willett, Associate Professor
accelerate.uoregon.edu/nick-willett
Slated to start at the Knight Campus in August 2021

$500 MILLION

SECOND GIFT FROM THE KNIGHTS, JULY 2021

UO RECEIVES SECOND $500 MILLION GIFT FROM KNIGHTS

Gift funds second phase of campus

The University of Oregon announced in July a second $500 million gift from Penny and Phil Knight, launching the next phase of its state-of-the-art research campus bearing their names.

With this gift, the Knight Campus is further expanding its strengths in bioengineering and applied scientific research and training, creating new opportunities for additional students, adding faculty positions and funding a second building.

The new gift is an overwhelming vote of confidence in what the Knight Campus has already been able to achieve in less than five years, according to Robert E. Guldberg, vice president and Robert and Leona DeArmond Executive Director of the Knight Campus.

“Our goal is to dramatically shorten the timeline between discovery and societal impact through world-class research, training and entrepreneurship in a nimble scientific enterprise. The vision of a campus focused on science that impacts society is resonating with so many people. We are incredibly grateful to the Knights for their unbelievable support to continue the momentum towards that vision,” Guldberg said.

UNIVERSITY OF OREGON

MILESTONES

30:

NUMBER OF FACULTY AND THEIR TEAMS TO BE HOUSED IN BOTH BUILDINGS OF THE KNIGHT CAMPUS

ARCHITECTURE TEAM:

PHASE TWO:

ZGF ARCHITECTS, LLP, PORTLAND, ORE.

GENERAL CONTRACTOR:

PHASE ONE AND TWO:

HOFFMAN CONSTRUCTION, PORTLAND, ORE.

PHASE TWO OF THE KNIGHT CAMPUS: A NEW BUILDING, FACULTY AND PROGRAMMING

The second $500 million gift from the Knights enables the Knight Campus to shift into phase two of its planning process, which includes a second building for research and innovation. The current plan is for a 175,000-square-foot, multi-story bioengineering and applied science research building to support expanded research programs and facilities.

The second building is slated to be built north of the first Knight Campus building, on two acres along Riverfront Research Parkway. It will create new core research facilities and flexible lab spaces that support bioengineering and applied science research.

In addition to funding design and construction, the gift will support faculty, academic and innovation programming, as well as support operations through an endowment. The next phase calls for 15 to 17 additional faculty members and their teams in bioengineering, regenerative medicine, biomedical data science, and other applied interdisciplinary sciences to lead research programs, bringing the total number of Knight Campus tenure-related faculty to 30.

More details: https://accelerate.uoregon.edu/celebration

UNIVERSITY OF OREGON

MILESTONES

6:

FOUNDING INSTITUTIONS IN THE WU TSAI HUMAN PERFORMANCE ALLIANCE

$225 MILLION

GIFT FROM JOE AND CLARA TSAI FOUNDATION TO LAUNCH THE ALLIANCE

UO FOUNDING PARTNER IN PRESTIGIOUS RESEARCH TEAM

The Wu Tsai Human Performance Alliance at Oregon to be based in Knight Campus and led by Professor Robert Guldberg

In July 2021, the Joe and Clara Tsai Foundation announced a $220 million gift over 10 years to initiate a partnership with Stanford University; Boston Children's, a Harvard Medical School Affiliate; the University of California San Diego; the Salk Institute for Biological Studies; and the University of Kansas.

Rather than study disease, alliance researchers will seek to understand peak physical performance—from the molecular level to the whole body—to advance human health and help us all lead healthier, more active lives.

The UO's role in the Wu Tsai Human Performance Alliance is based at the Knight Campus and funds research in multiple areas across the university, including the Bowerman Sports Science Center, Human Physiology, Biology, Sports Product Design, and Athletics.

Details at http://accelerate.uoregon.edu/performance

Wu Tsai Human Performance Alliance

UNIVERSITY OF OREGON

ARCHITECTURE TEAM:

PHASE ONE:

ENNEAD ARCHITECTS, NEW YORK CITY
BORA ARCHITECTS, PORTLAND, ORE.

GENERAL CONTRACTOR:

PHASE ONE AND TWO:

HOFFMAN CONSTRUCTION, PORTLAND, ORE.

A GRAND OPENING

Late in 2020, the University of Oregon celebrated the grand opening of the Phil and Penny Knight Campus for Accelerating Scientific Impact virtually, with a 30-minute documentary style video and panel live-streamed panel discussions. The virtual celebration drew many times the audience that would have been possible with a more traditional, in-person event.

In addition to the 30-minute video, the celebration featured six break out panel discussions on translational research, academic programming, the Knight Campus ecosystem and ethos, building design, partnerships and innovation. Participants were encouraged to download a mixed-reality app to experience the building first hand.

You watch the video portions and download the app at http://accelerate.uoregon.edu/grand

UNIVERSITY OF OREGON

$10 MILLION

A 2019 GIFT FROM PORTLAND'S MARY AND TIM BOYLE TO FUEL THE START OF A JOINT CENTER IN BIOMEDICAL DATA SCIENCE

CENTER FOR BIOMEDICAL DATA SCIENCE

The University of Oregon and Oregon Health & Science University in 2021 launched a search for a director to lead the joint Center for Biomedical Data Science.

The center, announced in 2019, is a partnership between the UO's Phil and Penny Knight Campus for Accelerating Scientific Impact and the OHSU Knight Cancer Institute. It empowers researchers to detect and fight deadly forms of cancer and other diseases. The research center will develop new approaches to quickly and efficiently analyze large groupings of data, allowing researchers to "listen in" on cell development for early detection of lethal diseases.

The goal is to have a director hired in the first half of 2022.

OREGON HEALTH & SCIENCE University OHSU

UNIVERSITY OF OREGON

MILESTONES

FACULTY LEADERS

Paul Dalton

Karen Guillemin

Judith Eisen

Robert Guldberg

Leslie Leve

Bill Cresko

THE CENTER FOR TRANSLATIONAL BIOMEDICAL RESEARCH

The University of Oregon's Phil and Penny Knight Campus for Accelerating Scientific Impact and PeaceHealth launched a first-of-its-kind-collaboration between the Knight Campus and PeaceHealth, a regional medical provider.

The Center for Translational Biomedical Research, a partnership between PeaceHealth and the Knight Campus, facilitates clinical need-based research collaborations by helping to translate discoveries from Knight Campus and UO to patients. It also supports training for underrepresented post-doctoral scholars who work with Knight Campus faculty and affiliate labs as well as PeaceHealth clinics.

In June, the Knight Campus, along with PeaceHealth, announced the first research projects and three of four post-doctoral fellows selected to take part in a first-of-its-kind joint effort between the organizations.

Postdoctoral fellowships for candidates from underrepresented communities in science and engineering mark the center's first effort. Fellows will work with UO faculty members and PeaceHealth providers on mentored independent research with a clinical emphasis in the PeaceHealth medical domains.

The fellowships offer support tailored to the development of postdoctoral scientists and engineers from underrepresented communities, as defined by the National Science Foundation.

A panel of UO and PeaceHealth representatives selected the projects to receive initial support. They tackle 3D printing of surgical implants, impacts of microbiota on neurodevelopment, rehabilitation strategies for osteoarthritis and prevention of COVID-19 in Latinx communities.

While recruiting for the biomedical engineering fellowship continues, three candidates have already been selected for post-doctoral fellowships.

Details: https://accelerate.uoregon.edu/center-translational-biomedical-research

PeaceHealth

UNIVERSITY OF OREGON

THE CENTER FOR TRANSLATIONAL BIOMEDICAL RESEARCH FELLOWS

David James

David James, who completed his doctorate at the University of Miami, will investigate how the microbiota impact visual system development with Professor Karen Guillemin, of the Institute of Molecular Biology and Department of Biology, and Professor Judith Eisen, of the Institute of Neuroscience and Department of Biology.

Lina Maria Mancipe Castro

Lina Maria Mancipe Castro completed her doctorate at Georgia Tech where she studied tissue-binding nano-composite microgels as an intra-articular drug delivery system for osteoarthritis treatment. Now, as part of her fellowship, she will work in the Guldberg Lab on improving the effectiveness of stem cells in osteoarthritis therapy.

Veronica Michelle Oro

Veronica Michelle Oro is completing her doctorate at Arizona State University where she is using twin data to examine shared genetic and environmental liabilities underlying chronic pain and mental health in middle childhood across diverse cultural contexts. As part of this fellowship, she will work closely with Knight Campus Faculty Fellows and UO professors Leslie Leve, of the Prevention Science Institute and College of Education, and Bill Cresko, of the Institute of Evolution and Ecology and Department of Biology, to examine and improve COVID-19 prevention in Latinx communities.

Details at: https://accelerate.uoregon.edu/center-translational-biomedical-research

PeaceHealth

UNIVERSITY OF OREGON

A FIRST:

THE BIOENGINEERING PHD PROGRAM MARKS THE UO'S FIRST DEGREE OFFERING IN ENGINEERING.

KNIGHT CAMPUS PARTNERS WITH OSU TO OFFER BIOENGINEERING

This fall, the Knight Campus bioengineering doctoral program, a joint effort with Oregon State University, will grow to nearly 20 doctoral students. The program marks the UO's first degree offering in engineering. Also this fall, the Knight Campus will launch a minor in bioengineering, the first undergraduate program in the Knight Campus and the UO's first undergraduate engineering offering. The minor has been designed to complement the work of STEM majors in biology, chemistry and biochemistry, human physiology, and physics.

Details on Bioengineering at http://bioengineering.uoregon.edu

OREGON'S COMBINED STRENGTHS

UNIVERSITY OF OREGON

MILESTONES

90%
OF STUDENTS

IN THE ACCELERATED MASTER'S PROGRAM LAND JOBS WITHIN 3 MONTHS OF GRADUATING

98%

GRADUATION RATE

$66,000

AVERAGE INTERNSHIP SALARY FOR 2021 COHORT

55%

PERCENTAGE OF THE 2021 COHORT WHO ARE TRADITIONALLY UNDERREPRESENTED IN STEM

KNIGHT CAMPUS GRADUATE INTERNSHIP PROGRAM

In the fall of 2021, there are over 100 students pursuing master's degrees while specializing in areas of materials science, bioinformatics and genomics, with an emphasis on hands-on training.

Students gain critical skills through focused coursework and labs, professional development training, and a 9-month paid internship. Program tracks span the fields of engineering, physics, chemistry and biology and include:

- Bioinformatics and Genomics
- Molecular Sensors and Probes
- Polymer Science
- Semiconductor and Photovoltaic Device Processing
- Optical Materials and Devices

The program operates on an accelerated timeline, kicking off in the summer. Students typically complete their degree in 15-18 months, including a nine-month paid internship.

UNIVERSITY OF OREGON

MILESTONES

12:
2021 COHORT

9:
2020 COHORT

6:
2019 COHORT

UNDERGRADUATE SCHOLARS PROGRAM PUTS STUDENTS ON THE FAST TRACK TO DISCOVERY

The Knight Campus welcomed its third cohort of undergraduate scholars this year. The program pairs promosing young undergraduates with research mentors.

- Immersive research experience for an undergraduate cohort for a full year in a Knight Campus-affiliated lab
- Career development programming runs throughout the year
- Program Sponsors: the Maybelle Clark Macdonald Fund, Dave and Nancy Petrone, the Clark Honors College, Thermo Fisher Scientific, Industrial Source, Inc., and Bob and Tina Guldberg

Details on the Knight Campus Undergraduate Scholars Program at https://accelerate.uoregon.edu/kcus

UNIVERSITY OF OREGON

RESEARCH AWARDS AND HIGHLIGHTS

Ambati Lab Develops Gene Therapy for Eye Disease

Researchers in the Phil and Penny Knight Campus for Accelerating Scientific Impact have developed a new gene therapy that could eventually provide an alternative treatment for Fuchs' endothelial corneal dystrophy, a genetic eye disease affecting roughly one in 2,000 people globally. Currently, the only treatment is corneal transplant, a major surgery with associated risks and potential complications.

"When you do a transplant you make a huge difference for that person, but it's a big deal for the patient with lots of visits, lots of eye drops, lots of co-pays, and if you had a medical treatment that did not require surgery, that would be great," said Bala Ambati, a research professor in the Knight Campus and corneal surgeon who led an eight-year study involving the development of the gene therapy. "Not only could it help patients who need a transplant, but it could also help a lot of other people who could have used that (corneal) tissue."

The results of the study were published in the journal ELife. Investigators focused on a rare, early-onset version of the disease and carried out the research in mice. They used CRISPR-Cas9, a powerful tool for editing genomes, to knock out a mutant form of a protein that is associated with the disease.

Details at https://accelerate.uoregon.edu/gene-therapy

RESEARCH AWARDS AND HIGHLIGHTS

Hosseinzadeh Creates Molecules for Medicine

Computational biochemist Parisa Hosseinzadeh, an assistant professor who started at the Knight Campus in 2020, is using computer modeling to design synthetic peptides as potential drugs to treat challenging diseases.

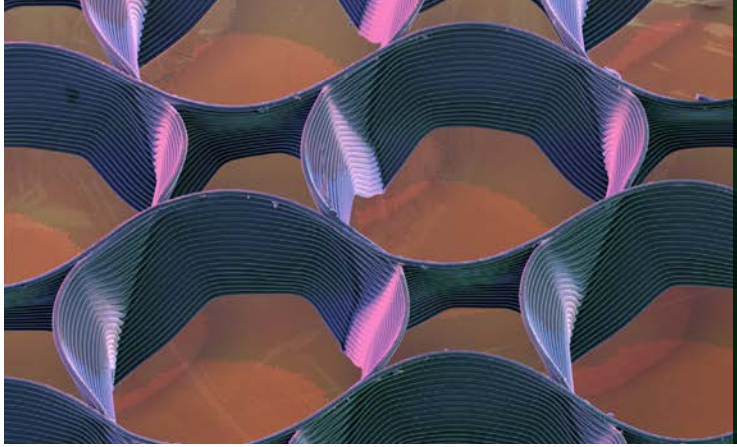
Hundreds of synthetic peptides, tiny molecules that contain two or more amino acids, are either in use or in clinical trials, but producing them is time-consuming and costly.

“Researchers have been generating huge libraries of random peptides and then screening them to see if they bind to a target or not. It is a random, trial-and-error process,” she said. “The problem with this method is that the overall space in which you can screen for candidate peptides is vast, like 10 to the 30th (power). In a best-case scenario, we can screen 10 to the 14th. It is impossible to screen everything.”

Her research at the Knight Campus aims to narrow that testing space of more than a hundred trillion possibilities to a smaller and more manageable pool of possible candidates. It builds on work she began before arriving at the UO last September.

This year has brought two new published studies from work done prior to her arrival in Eugene. In a paper published March 25 in ACS Catalysis, a journal of the American Chemical Society, Hosseinzadeh and colleagues addressed the applications of peptide design, particularly in probing the mechanism of enzymatic reactions. In a paper published online June 7 in Nature Communications, Hosseinzadeh, in her postdoctoral role at the University of Washington, and colleagues from the UW, University of Pennsylvania and Stanford University unveiled a proof-of-concept for a computational approach that reduces the screening time for peptides.

Details: https://around.uoregon.edu/content/knight-campus-scientist-creating-molecules-medicine



RESEARCH AWARDS AND HIGHLIGHTS

Dalton Seeks to 3D Print New Medical Implants

A materials scientist whose revolutionary 3D-printing techniques could make the University of Oregon a worldwide hub in the field joined the faculty at the Phil and Penny Knight Campus for Accelerating Scientific Impact in early 2021.

Paul Dalton, who invented and developed a unique technology enabling high-resolution 3D-printing with the potential to make advanced medical implants, started at the Knight Campus earlier this spring. Dalton's technology potentially can be applied to any tissue in the body, such as artificial blood vessels and dental implants, and used for bone and tendon repairs, while also supporting nerve regeneration. Several companies have integrated this technique into their 3D bioprinters.

Dalton and his international colleagues recently took a big step in both manufacturing precision and quality control by focusing the telescopic lens of a digital camera on the cone and nozzle of a printer to help predict size of fibers being printed. The advance was detailed in a proof-of-concept study published online on June 8 in the journal Advanced Materials.

Details: https://accelerate.uoregon.edu/paul-dalton-research

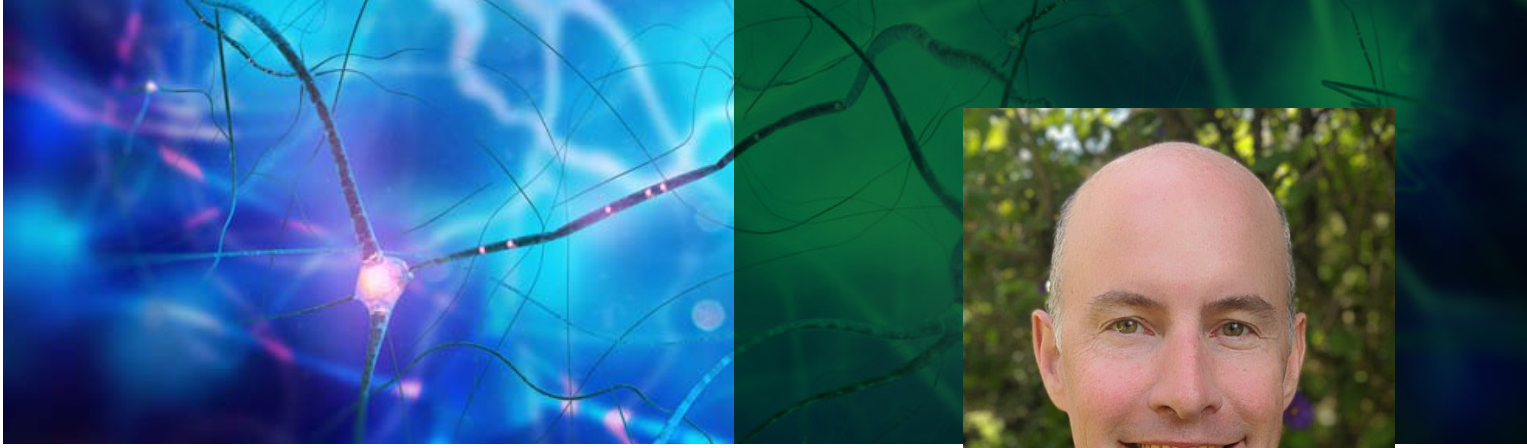
RESEARCH AWARDS AND HIGHLIGHTS

Guldberg-Led Team Links Suppressed Immune Response to Failed Bone Healing

A team led by Robert Guldberg of the Phil and Penny Knight Campus for Accelerating Scientific Impact reported that measurements of specific immune cells and proteins circulating in the blood immediately following trauma can be combined with advanced data analytics to predict whether injuries will successfully respond to treatment. The findings were published in early 2021 in the Proceedings of the National Academy of Sciences.

In the research, the team measured the blood-based biomarkers in a rat model previously created to mimic chronic femoral bone-healing failure similar to that seen in human trauma cases.

Details: https://around.uoregon.edu/content/suppressed-immune-response-linked-failed-bone-healing



RESEARCH AWARDS AND HIGHLIGHTS

Gardner Unveils a 3D Printed Device to Excite Nerve

A tiny, thin-film electrode with a 3D-printed housing has been implanted in the peripheral nervous system of songbirds, where it successfully recorded electrical impulses that drive vocalizations.

The research is seen as an advance in the emerging field of bioelectronic medicine and eventually could lead to a new treatment for diseases such as inflammatory bowel syndrome, rheumatoid arthritis and diabetes, said Tim Gardner, a neuroscientist at the Phil and Penny Knight Campus for Accelerating Scientific Impact.

Gardner was the principal investigator on the project detailed in 2020 in the journal Nature Communications.

His research team developed the device, called a nanoclip, that is about the diameter of a human hair. It is the first cuff electrode for recording or stimulating peripheral nerves to be fabricated on a scale compatible with the smallest nerves in the body. The research was done in his former lab at Boston University and is being further advanced in his Knight Campus lab.

Details: https://around.uoregon.edu/content/uo-scientist-unveils-3d-printer-housed-medical-device

RESEARCH AWARDS AND HIGHLIGHTS

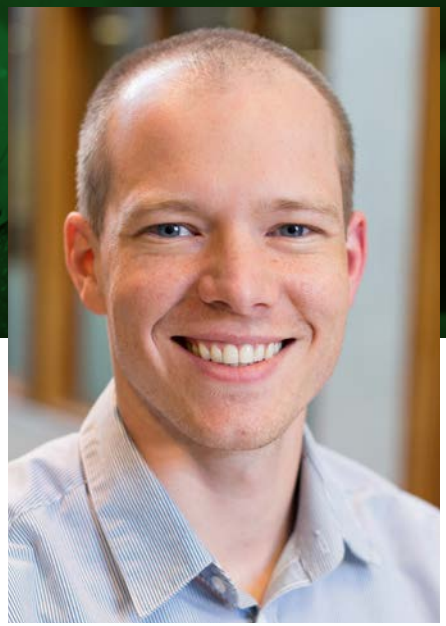
Guldberg-led Study Helps Guide Physical Therapy After Injuries

Racing into rehab too aggressively after a severe ankle sprain or bone fracture may hinder the ability of blood vessels to regrow and form a healthy network of blood vessels in the affected tissue.

That's the main message from new research that used 3D models made of a water-rich collagen gel cultured with fragments of blood vessels taken from fat. The work, done in a collaboration of scientists from the University of Oregon's Phil and Penny Knight Campus for Accelerating Scientific Impact, Georgia Tech and three other institutions, is detailed in Science Advances.

The work by the nine-member research team revealed fundamental new insights about the effects of mechanically loading tissues trying to reestablish vascularization following injury, said study co-author Robert Guldberg, vice president and Robert and Leona DeArmond Executive Director of the Knight Campus. The findings were detailed in Science Advances in 2020.

Details: https://around.uoregon.edu/content/uo-led-study-helps-guide-physical-therapy-after-injuries



RESEARCH AWARDS AND HIGHLIGHTS

Reeder Advances Health Devices

Research co-led by Jonathan Reeder, who joined the Phil and Penny Knight Campus for Accelerating Scientific Impact in the fall of 2020, provides a preview of health monitoring devices and tools for fundamental brain research he is pursuing.

In a paper in PNAS, completed during his postdoctoral work at Northwestern University, his team detailed advances in a soft, bandage-like patch lined with tiny channels and electronic sensors that collect and analyze sweat for health monitoring purposes. The paper published online Oct. 26 in Proceedings of the National Academy of Sciences.

In his new lab, work will continue on advancing the type of soft, biointegrated devices that was detailed in the paper, said Reeder, who joined the UO in September. He also has his sights set on an implant to mute pain following surgical repairs.

Details: https://around.uoregon.edu/content/knight-campus-scientist-looks-advance-health-devices

RESEARCH AWARDS AND HIGHLIGHTS

Hettiaratchi Alters Enzyme; Offers Hope for Spinal Injury and Stroke

An enzyme proven to help regrow damaged nerve tissue in animals but too unstable for use in humans has been redesigned for stability in research co-led by Marian Hettiaratchi of the Phil and Penny Knight Campus for Accelerating Scientific Impact and detailed in Science Advances in 2020.

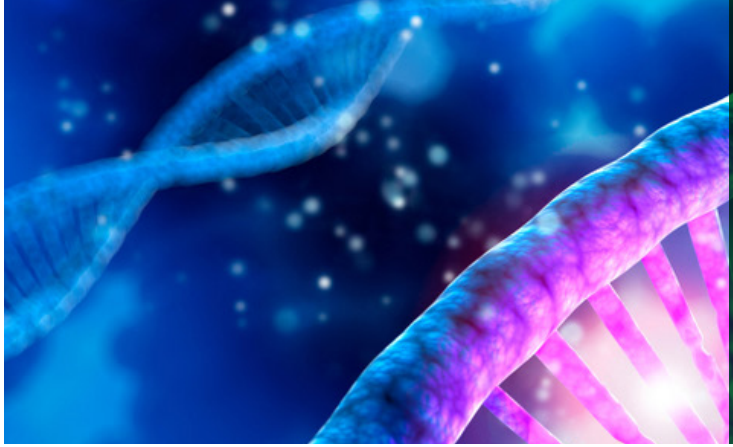
With stability added, the enzyme found in many types of bacteria, chondroitinase ABC, could potentially be repurposed to help reverse nerve damage caused by strokes and as a treatment for spinal cord injuries.

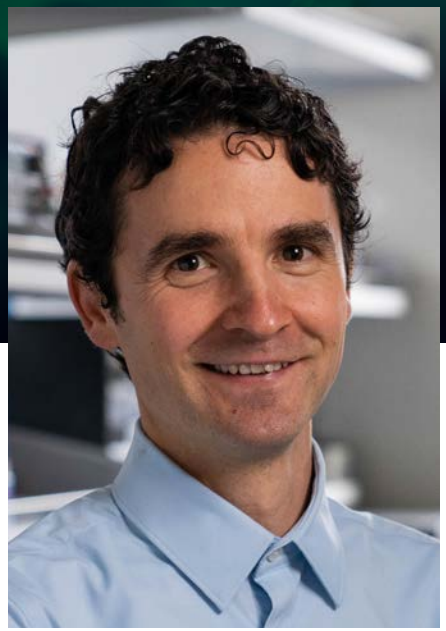
A major challenge for healing in such cases is the formation of glial scars that are rapidly formed by cells and biochemicals that knit together around damaged nerves. Initially the scarring offers a protective shield but over time it inhibits nerve repair.

“A glial scar is similar to other scars that form when you injure other parts of the body in that it protects the tissue from further damage, but glial scars don’t heal and remodel into healthy tissue like other scars typically do,” Hettiaratchi said. “Chondroitinase ABC is a promising therapeutic protein, because it can degrade components of the glial scar, allowing healthy neurons to regrow.”

Details: https://around.uoregon.edu/content/altered-enzyme-offers-hope-spinal-injury-and-stroke

UNIVERSITY OF OREGON





RESEARCH AWARDS AND HIGHLIGHTS

Plesa Boosts Strength of Genetic Synthesis

A gene synthesis method that promises to help researchers understand how mutations give rise to disease has been dramatically increased in power in work co-led by a scientist in the Phil and Penny Knight Campus for Accelerating Scientific Impact.

With a series of tweaks, researchers can now synthesize four times the number of genes with five times the fidelity – the amount of completely correct molecules – than was possible when the method, DropSynth, was unveiled in 2018 in the journal Science by scientists at UCLA.

The improvements were detailed by a five-member team, which includes UO synthetic biologist Calin Plesa, in the journal Nucleic Acids Research. Plesa, who joined the Knight Campus in August 2019, was a member of the UCLA group as a postdoctoral researcher. He is now working to improve the method even further in his UO lab.

Details: https://around.uoregon.edu/content/knight-campus-scientist-boosts-strength-genetic-synthesis

UNIVERSITY OF OREGON

KNIGHT CAMPUS SELECT STUDENT BIOS

Samuel Lester, Harper, Texas

Bachelor of science in Mechanical Engineering and Material Science from Duke University, 2020

KNIGHT CAMPUS PROGRAM: Joint UO-OSU Doctorate Program in Bioengineering

MENTOR OR LAB: Robert Guldberg, Guldberg Musculoskeletal Research Lab

LESTER SAYS: "The hands-on training in the midst of world-class research sets apart the Knight Campus from anywhere I've experienced. There is a deep-rooted emphasis in exploring the state-of-the-art facilities available and identifying what's possible. Each project I am working on already requires a versatile approach, and the expert training I am receiving is jumpstarting me to take advantage of every aspect of the campus."

Demi Glidden
Tacoma, Washington

Bachelor of science in Biology from Lewis & Clark College, 2016

KNIGHT CAMPUS PROGRAM: Knight Campus Graduate Internship Program Bioinformatics Track

GLIDDEN SAYS: "The Knight Campus Graduate Internship Program is exactly what I was looking for to launch my career. Even through remote learning, I have been able to cultivate the technical and soft skills needed to be successful in my field. The program's emphasis on teamwork and collaboration make me feel confident and prepared."

UNIVERSITY OF OREGON