



OREGON CLINICAL
& TRANSLATIONAL
Research Institute

OCTRI Innovation Programs & Awards

2019-2023 Evaluation Summary Report

February 2024



National Center
for Advancing
Translational Sciences



Contents

OCTRI Innovation Programs & Awards	2
Pilot Awards Program Outcomes	4
Pilot Award Collaborations	5
New Programs and Offerings	6
Biomedical Innovation Program (BIP)	7
BIP Project Highlights	8
Additional Pilot Awards	11
Education	12
Translational All-Stars	14
2019-2023 Awardees	15

OCTRI Innovation Programs & Awards



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Much has happened since our last Report was published in 2019. This year, we celebrate the 10-year anniversary of our Biomedical Innovation Program (BIP)! During the last decade, BIP has funded 62 innovative ideas, and helped guide them on the path to product development and commercialization. One of the technologies in our original cohort became the foundation for the OHSU startup company, NeuraMedica, which recently received FDA clearance for its product DuraFuse – a novel device to close the dura membrane during spinal surgeries. Since 2013, BIP has grown from one track of funding to three, including: medical devices diagnostics, drug discovery, and digital health. In 2020, we were also able to offer a COVID-19 focused track to accelerate the development of innovative technologies that addressed an urgent need for our community.

In 2018, we launched the BIP-Commercialization Readiness Program, based on the state-of-the-art I-Corps methodology, to provide access to entrepreneurial education to our growing innovation community. We participated in an effort led by the University of Alabama called I-Corps@NCATS, which allowed us to join 22 other university hubs to share best practices and improve our entrepreneurial education programming. Importantly, our participation in I-Corps@NCATS gave us access to national instructors, who brought tremendous expertise to our community in Oregon.

In 2022, we received notice of our grant renewal for our home organization: The Oregon Clinical and Translational Research Institute (OCTRI), which allowed us to expand on the programs we offer to address additional gaps along the innovation spectrum. We are excited to launch new programming to help innovators better understand the regulatory environment and plan for success when working with the U.S. Food & Drug Administration; and to expand our efforts to more directly support under-represented innovators.

We certainly would not have accomplished all we have without the outstanding support and active participation of our reviewers, mentors, colleagues from OHSU Innovates as well as partners across OHSU and beyond. We are grateful and inspired to support the impactful research translation happening at OHSU.

Thank you!

Aditi Martin, Ph.D.

Program Director, OCTRI Innovation Programs and Awards
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Oregon Clinical & Translational Research Institute

The Oregon Clinical and Translational Research Institute (OCTRI) is one of 60+ Clinical and Translational Science Award (CTSA) recipients working together to improve the translational research process across the country. Located at Oregon Health & Science University (OHSU), OCTRI's mission is to enhance the efficiency and quality of rigorously translating research ideas into impact. We do this by funding and managing programs that catalyze translational research, cultivate innovation, foster collaborations, develop the translational workforce, and enhance partnerships with communities.

OCTRI is funded through the National Institutes of Health (NIH) National Center for Advancing Translational Sciences (NCATS). Additional funding sources include institutional commitment from OHSU and direct payment for services provided to researchers.

OCTRI Strategic Goals

Innovation Programs & Awards (IPA) span all five of OCTRI's strategic goals:

1. Increase the quality and efficiency translational research
2. Cultivate innovation in informatics for research
3. Foster and support team science and scientific collaboration
4. Expand and diversify a translational workforce
5. Strengthen partnerships with communities

OCTRI Innovation Programs & Awards (IPA)

OCTRI Innovation Programs & Awards supports translational research by fostering discoveries, cultivating an innovation mindset, and providing support for proof-of-concept data generation. OCTRI pilot awards provide investigators with funding and resources to translate their research to societal impact. Outcomes include follow-on funding, publications, innovative technologies that result in start-up formation, and/or partnerships with other entities. To further support this effort, OCTRI offers a portfolio of educational programming targeting innovation and entrepreneurship.

Existing IPA Resources



Pilot Awards

- Biomedical Innovation Program
- CTSC Career Development Award Support
- Mobile Apps for Clinical Studies
- Phase 0 SBIR/STTR Support
- Regulatory Consultation and Assistance Program



Education

- BIP Commercialization Readiness Program
- INVENT Seminar Series
- Student Innovator Challenge



Resources

- Market Research Lab
- Drug and Device Advisory Committee
- Access to experts and consultants

PILOT AWARDS PROGRAM OUTCOMES



17 years
 7 Funding Partners
 225 Principal Investigators served
 263 Projects supported
 50 Departments supported
 \$8.1M Awarded

\$152.8M Follow-on Funds

283 Publications

207 Collaborations within OHSU

252 Collaborations with external OHSU partners



Follow-on Funding and Publications over the Last Five Years

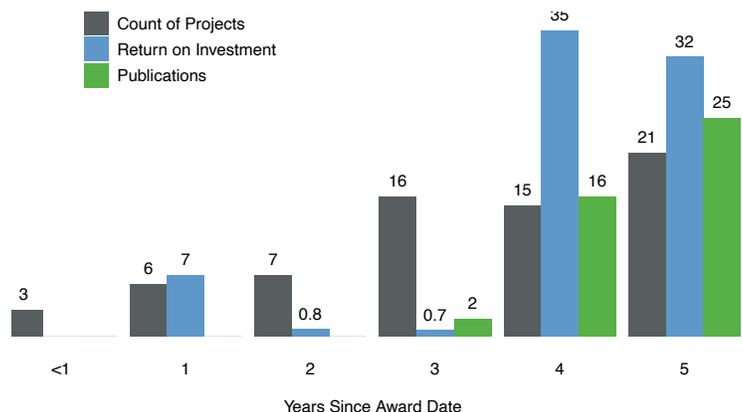
Years Since Award Date	Count of Projects	OCTRI Investment	New Funding	Basic ROI*	Publications
<1	3	\$40,000	\$0	0	0
1	6	\$140,000	\$975,000	7.0	0
2	7	\$300,000	\$251,946	0.8	0
3	16	\$592,000	\$435,417	0.7	2
4	15	\$604,997	\$21,172,951	35.0	16
5	21	\$472,310	\$15,092,816	32.0	25

***Return on Investment**
 ROI=For each OCTRI dollar invested, the dollars returned in new funding. Sources of new funding include federal, industry, and foundation grants. New funding is reported by each OCTRI principal investigator and verified by OCTRI evaluation staff. Basic ROI is routinely reported by CTSA's and other NIH-funded institutes.

Projects Take Time to Show Results

Average time to first **follow-on grant**:
21 months

Average time to first **publication**:
19 months



PILOT AWARD COLLABORATIONS

The IPA team engages in highly successful collaborative efforts across the Pacific Northwest and beyond, forging crucial partnerships that propel innovation in the biotech and life sciences sectors. By strategically aligning with key organizations, we are instrumental in driving the advancement of cutting-edge technologies, providing essential commercialization services, and facilitating access to vital resources for regional enterprises. This concerted approach not only fosters scientific progress but also strengthens the economic and technological landscape of the entire Pacific Northwest region for societal impact.

Business Oregon

Since 2015, OCTRI has partnered with Business Oregon, the State of Oregon's economic development agency, to offer an SBIR/STTR application support program (called Phase 0) to small businesses in the

state developing healthcare technologies. The program has assisted 16 companies in successfully securing over \$9.1 million in SBIR/STTR Phase I, Phase II, and Fast-track funding.

Impact: Oregon had the highest NIH SBIR/STTR funding success rate in the United States at 22% (2012-2021). Phase 0 recipients had SBIR/STTR funding success of 36% (includes NIH, NSF, DoD, Phase I, Phase II, and Fast-track).

<https://ssti.org/blog/useful-stats-nih-sbirsttr-application-success-rates-trends-fy-2012-2021>

Other Collaborations

Angel Oregon Life & Bioscience (AOBIO)
Centers of Innovation Excellence in Bioscience
Regional Innovation Hub
OHSU Department of Surgery
OHSU Department of Medical Informatics and Clinical Epidemiology (DMICE)

OHSU Innovates

In 2021, OHSU Innovates launched as a collaborative that supports the innovation and entrepreneurial ecosystems at OHSU and beyond. The network includes OHSU

OHSU Innovates Technology Transfer, OHSU Collaborations & Entrepreneurship,

Oregon Clinical and Translational Research Institute, OHSU School of Medicine, and OHSU Knight Cancer Institute.

Impact: Comprehensive and coordinated intellectual property management, technology development support, partnership management, and access to a portfolio of resources and programs targeting innovators and entrepreneurs.

OHSU Foundation

The OHSU Foundation is a critical partner which provides funding for awarded BIP projects through a number of channels; including the University Venture Development Fund (UVDF) and through donations to the OHSU Innovation Development and Entrepreneurship Acceleration Fund (IDEA) Fund to support innovation and commercialization.

Impact: The OHSU Foundation has facilitated nearly \$1 million in funding for BIP projects since 2019.

To donate to the IDEA Fund, [click here](#) or go to https://give.ohsufoundation.org/?fund_id=OHSUPARTVENT&src=OHSV21QLO



OREGON
ENTREPRENEURS
NETWORK



NEW PROGRAMS AND OFFERINGS

The Drug and Device Advisory Committee (DDAC)

The DDAC provides a no-cost consultation and advice to investigatory teams, focusing on tasks needed to efficiently move a new drug or device towards commercialization. The DDAC advisory panel is comprised of individuals with diverse experience and expertise in life science technology development and entrepreneurship. They can advise in the areas of FDA regulatory affairs, IP development and protection, clinical protocol, engineering, and marketing.

Market Research Lab

This project is a resource for entrepreneurs, clinicians, and researchers at OHSU who want to learn more about pharmaceutical, diagnostic, device, and digital health markets. By providing access to leading market intelligence databases and expert analysis of commercial markets, Market Research Lab is a valuable tool for innovators and entrepreneurs working to understand the market landscape for their innovation. This data can aid in developing a solid commercialization plan for a grant application or investor pitch.

The Regulatory Consultation and Assistance Program (RCAP)

The RCAP provides eligible OHSU innovators and entrepreneurs up to \$7000 per project, which can be used to support efforts to understand and navigate the regulatory environment for medical devices, diagnostics, drugs, and software. Recipients may hire regulatory consultants to provide an overview of FDA rules and procedures specific to their technology or project and help create a roadmap to guide teams in the transition from the ideation phase of their project to proof-of-concept. This will ensure that study design or prototype iterations are developed in accordance with FDA regulations and accelerated commercialization.

OHSU Innovates Seminar Series

The OHSU Innovates Seminar Series is a quarterly offering to engage the entrepreneurial community with inspiring stories of success and lessons learned. Through interactive sessions, expert panels, and collaborative workshops, these events strive to both showcase and empower individuals with diverse backgrounds and experience to break down barriers and catalyze a more equitable and innovative future.

BIOMEDICAL INNOVATION PROGRAM (BIP)

Biomedical Innovation Program: Celebrating 10 Years of Excellence

The Biomedical Innovation Program (BIP) supports the development and commercialization of novel and innovative technologies that provide solutions to unmet healthcare needs. By prioritizing market needs and project management, the BIP puts awardees in the best possible position to commercialize their technologies and improve human health.

BIP includes two principal tracks of funding: Device, Diagnostic, & Software, and Drug Discovery. Additionally, BIP has supported projects related to Digital Health and COVID-19.

In addition to providing seed funding for promising projects, the BIP supports awarded Principal Investigators (PIs) with dedicated project management, professional mentors, and numerous innovation and entrepreneur education opportunities. BIP is offered in partnership with OHSU Innovates. BIP also has developed important alliances with the State of Oregon's Centers for Innovation Excellence: Oregon Translational Research and Development Institute (OTRADI), Oregon Nanoscience and Microtechnologies Institute (ONAMI), and Business Oregon.

Video Spotlight

Visit https://youtu.be/wmyh_GxnHWY? to hear from some of our past BIP awardees.

"The BIP played a critical role in the early stages of development for our bioabsorbable dural closure clip and applier technology. The funding allowed us to complete proof-of-concept work and submit two patent applications which led to additional follow-on funding and the eventual commercialization and FDA Clearance of our surgical device. The support and guidance of the BIP team was invaluable to our success!"

- Rachel Dreilinger, Co-Founder and CEO of NeuraMedica

BIP Outcomes

16 Technologies Licensed/Optioned
20 Start-up Companies Formed
15 Patents Issued
30 Active Patent Applications

13 Industry Partner Contracts
\$59 million in follow-on funding
47 Publications

BIP Support: Four Pillars

Funding & Development

Proof-of-concept grants for OHSU investigators
SBIR/STTR pre-submission support (Phase 0)
Access to technology development resources across Universities and CTSA's

Project Management

Track milestone progress
Remove barriers & create solutions
Provide access to mentors
Drive next stage funding
Identify commercialization resources

Innovation & Entrepreneur Education

In-depth courses and workshops led by industry experts
INVENT series at OHSU
BIP Corp

Customized Mentoring

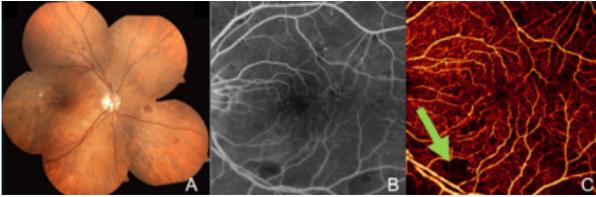
Mentorship provided by:
BIP review committee members
OHSU faculty and staff
Business community and regional biomedical partners
OHSU's Executives-in-Residence



COMMERCIALIZATION

BIP PROJECT HIGHLIGHTS

BIP Device, Diagnostic & Software Track



An eye diagnosed with DR imaged using different imaging modalities. (A) Color fundus (B) Fluorescein angiography (C) An optical coherence tomography angiography (OCTA); the green arrow points to a non-perfusion area.

Comprehensive Diabetic Retinopathy Reading Platform Based on Optical Coherence Tomography

Yali Jia, Ph.D., FAIMBE

Associate Professor of Ophthalmology & Biomedical Engineering, Jennie P. Weeks Professor of Ophthalmology, Associate Director of Center for Ophthalmic Optics & Lasers, Casey Eye Institute

Diabetic Retinopathy (DR) is already the leading cause of blindness in working age adults in the US, and the prevalence of diabetes is rising. Innovative DR screening models are needed to efficiently and accurately identify patients with clinically significant disease without overstressing the healthcare system. A key biomarker, called non-perfusion area, has been shown to correlate with DR staging and can be imaged using Optical Coherence Tomography Angiography (OCTA).

Using BIP funding, Dr. Jia successfully developed a robust NPA detection algorithm using deep learning and benchmarked its performance against an established rule-based approach. These were critical steps to demonstrating the platform's functionality.

Dr. Jia presented these findings at the annual conference of the Association for Research in Vision and Ophthalmology. A non-exclusive license for this technology is currently being negotiated between OHSU and a third party. Dr. Jia is exploring options for forming a startup company and applying for SBIR/STTR funding.

Predicting Onset of Parturition (POP!) in Women using Core Body Temperature and Wearable Sensors

Elise Erickson, Ph.D., C.N.M.

Assistant Professor, School of Nursing

Precisely predicting when a pregnant woman will begin laboring remains a clinical and sociological mystery. Women are given an estimated "due date" of 40 weeks after the last menstrual period but are told to expect normal term birth to occur typically within a span of 5

weeks. In the absence of more precise estimates, families and maternity care providers alike live in anticipation.

Dr. Elise Erickson, Ph.D., C.N.M., was awarded a BIP grant in 2020 to develop a tool that can forecast the timing of spontaneous labor onset and better manage provider/patient uncertainty. Scientists have documented that a female's body temperature drops prior to the onset of parturition in many other mammalian species, but there is a dearth of studies that support the same activity in humans. To that end, Dr. Erickson's BIP award supported a longitudinal study of 120 pregnant and postpartum women, with the data to be used to create a machine learning algorithm to predict labor onset.

This research is supporting several journal submissions (including a publication in npj Digital Medicine) and five proposals for follow-on funding. On the commercialization front, Dr. Erickson developed a partnership with a wearable technology company, completed the NSF I-Corps regional program, and is in the early stages of developing the accompanying smartphone app.

BIP Drug Discovery Track

Allosteric Modulation of PARP1-DNA Binding with Small Molecule Inhibitors: A Potential Therapeutic Strategy for Treating Certain Cancers

Michael Cohen, Ph.D.

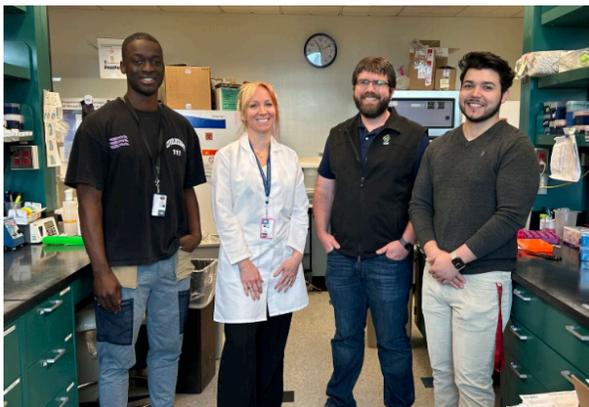
Associate professor of chemical physiology and biochemistry in the OHSU School of Medicine

Drugs known as PARP-1 inhibitors have emerged as an important but limited treatment option for certain types of cancers, including ovarian, breast, and prostate. In 2019, Dr. Michael Cohen, Ph.D., received BIP Drug Discovery funding, which he and his team used to test a new class of PARP-1 inhibitors with unique and powerful anti-cancer properties that could make them more widely effective.

One of the molecules the lab synthesized, Pip6, is toxic to cancer cells at very low doses. Additionally, PARP-1 inhibitors like Pip6, exhibit a unique mechanism of action-allosteric modulation of DNA binding to the target protein, suggesting that they could be given less frequently than existing PARP inhibitors.

The work Dr. Cohen completed as part of the BIP led to a paper in Cell Chemical Biology. To accelerate development, Dr. Cohen co-founded a startup called Tilikum Therapeutics, Inc, which optioned the intellectual property from OHSU in 2023.

The next phase of the project is to test Pip6 and related molecules in animal models to assess toxic side effects, minimum dosing levels, and how often doses need to be given to maintain effectiveness.



From left: Kofi Asare-Konadu, research assistant; Ruth Napier, Ph.D., assistant professor of molecular and immunology at OHSU School of Medicine; Jonathan Pruneda, Ph.D., assistant professor of molecular microbiology and immunology at OHSU School of Medicine; and Nick Alvarez, research assistant.

Small molecule restoration of UBA5 to treat early-onset neurodegenerative disease

Jonathan Pruneda, Ph.D.

Assistant Professor of Molecular Microbiology and Immunology, School of Medicine

Ruth Napier, Ph.D.

Assistant Professor of Molecular Microbiology and Immunology and Arthritis and Rheumatic Disease, School of Medicine

Principal Investigator, VA Portland Health Care System

Sanjay V. Malhotra, Ph.D. FRSC

Professor and Sheila Edwards-Lienhart Endowed Chair in Cancer Research, Cell, Developmental and Cancer Biology, School of Medicine, Director, Center for Experimental Therapeutics, OHSU Knight Cancer Institute, School of Medicine

Within the first two years of life, children with the rare neurodegenerative disease called UBA5 suffer from early-onset epileptic encephalopathy, involuntary movement disorders, epilepsy, and often death. While there are currently no treatment options for children with this disease, a high throughput assay developed by Dr. Jonathan Pruneda, capable of measuring UBA5 enzymatic activity, is playing a critical role in developing one.

With BIP funding, the project team screened 1,400 FDA approved drugs in order to identify small molecules that correct the activity of mutated UBA5 variants. Several promising activators were identified that enhanced UBA5 function, as well as a handful of putative inhibitors that diminished UBA5 activity. The team is now in the process of further validating these activators and inhibitors using orthogonal biochemical assays in the Pruneda lab and in UBA5 patient-derived cell lines in the Napier lab.

In May 2023, as part of the OHSU Foundation's "Give Day," the project team received \$65,000 in philanthropic donations, which were matched dollar for dollar by the Raiden Science Foundation.

Digital Health

Novel Artificial Intelligence Algorithm to Automatically Detect, Diagnose, and Determine the Severity of Cardiac and Pulmonary Disease

Peter Schulman, M.D.

Professor of Anesthesiology and Perioperative Medicine, School of Medicine

After 200 years, the stethoscope remains ubiquitous in health care today because when properly used it is patient-friendly, inexpensive, and a highly effective screening tool. Auscultation, consequently, continues to be a key component of virtually every physical examination, and also plays a valuable role in educating health-care providers. However, the prognostic value of the stethoscope is entirely user dependent, and numerous studies have demonstrated that the proficiency of even very experienced clinicians can be poor.

To address this problem, Dr. Peter Schulman and his team received BIP funding to develop a novel artificial intelligence algorithm that would be used in conjunction with a commercially available digital stethoscope to automatically detect, diagnose, and determine the severity of a broad range of cardiopulmonary disorders. By significantly improving the speed and accuracy of cardiopulmonary screening, the application would benefit millions of patients and dramatically reduce healthcare costs. The team collected nearly 1000 phonocardiogram heart sounds from 400 research subjects and used the data to develop a proof-of-concept heart murmur detection algorithm.

Schulman and his collaborators formed a start-up company called Tellunostics, recruited a CEO, and are pursuing SBIR funding to further the next stages of development. Research findings were published at the 2021 IEEE International Conference on Bioinformatics and Biomedicine.



Early prototype of the "Telluscope" digital stethoscope developed by Dr. Schulman and his team.

COVID-19

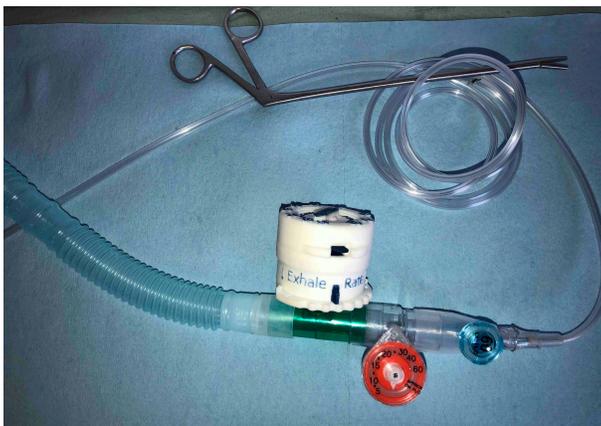
OHSU 3D Printed CRISIS Ventilator

Albert Chi, M.D.

Associate Professor of Surgery, Division of Trauma, Critical Care and Acute Care Surgery, School of Medicine

The worldwide pandemic of COVID-19 was a monumental public health threat that led to significant impacts on US healthcare systems. Projections indicated that somewhere between 10% to 25% of patients sick with COVID-19 would eventually require breathing assistance. Further, roughly 5% of patients would develop acute respiratory distress syndrome (ARDS), at which point only mechanical ventilation could give them a chance of surviving COVID-19. With a shortage of ventilators imminent, Dr. Albert Chi and his team received BIP funding to produce a low-cost 3-D printed ventilator and complete a five-animal study to further study the device and gather preliminary data.

Dr. Chi found a willing partner in an Oregon medical device company, Astoria-Pacific, who brought engineering and 3-D printing expertise to the project. The partnership enabled the team to leverage their BIP funding to make significant strides toward commercializing their ventilator and saving lives. Patent applications have been filed and are under review. Astoria-Pacific is leading quality management and assisting with the FDA approval process. Research findings were published in *The American Journal of Surgery* in 2022.



A low-cost 3-D printed ventilator created by Dr. Chi and his team. In partnership with Astoria-Pacific, BIP funding supported larger commercialization of the ventilator in order to save lives.



Dr. Tafesse used BIP funding to conduct a study using antibodies from alpacas. This research helped Dr. Tafesse's team create an assay that became the foundation for most of their COVID-19 studies.

SARS-CoV-2 Nanobodies as Therapeutics Against COVID-19

Fikadu Tafesse, Ph.D.

Assistant Professor of Molecular Microbiology and Immunology, School of Medicine

SARS-CoV-2 caused a devastating pandemic that crippled healthcare systems, destroyed economies and killed over 1.1 million people in the United States, alone. At the time of the pandemic's start, there were no vaccines or antiviral therapies. Dr. Fikadu Tafesse, an assistant professor of molecular microbiology and immunology, saw the promise of harnessing the potential of nanobodies for therapeutics against COVID-19. Of particular interest to Tafesse were nanobodies from alpacas, which are uniquely composed of a single component. Their relatively small size (1/10th of the size of conventional antibodies) allows researchers to easily isolate just the gene for the sticky part of the antibody and engineer flasks of bacteria to mass-produce those virus-sticky segments, called nanobodies, by the billions.

BIP funding allowed Tafesse to conduct a study with alpacas to characterize nanobodies directed at SARS-CoV-2 surface proteins and analyze the antiviral activities. This research helped Tafesse and his team establish a SARS-CoV-2 live virus neutralization assay that became the foundation for most of their COVID-19 studies, and resulted in over 15 journal articles.

ADDITIONAL PILOT AWARDS

Pathways to Independence

Awards early career investigators through research funding to strengthen their application for an R-level grant from the NIH and support development of their long-term research goals. Awardees are funded \$20,000 for one year to expand career development award research activities for next step funding.

Strategic Investment Fund

Provides critical and timely support for projects that are close to achieving independent funding and have potential for high-impact in the investigator's field of research. Awards are funded up to \$20,000 for one year.

Clinical and Translational Research Center (CTRC) Clinical Development Award Support

Supports early career investigators in working with OCTRI CTRC research services, related to their funded career development award study. CTRC services include study coordination, nursing services, Bionutrition, core lab, and biospecimen storage. Awards provide up to \$20,000 in CTRC services to propel the investigator towards independent funding.

Pilot Highlights



Miranda Lim, M.D., Ph.D.

Assistant Professor of Neurology

Awarded: Pathways to Independence

Dr. Lim conducted a pilot study with the goal of establishing the effect of dietary supplementation with branched chain amino acids (BCAAs) on sleep on cognition in Veterans with prior history of trauma exposure. The preliminary data generated from this pilot was used to convert Dr. Lim's VA CDA2 into a VA Merit award in 2021.



Andrew McHill, Ph.D.

Research Assistant Professor, Oregon Institute of Occupational Health Sciences

Awarded: CTRC Career Development Award Support

Dr. McHill was awarded two consecutive years of CTRC funding support for research related to his K01. His K01 research aimed to identify potential circadian mechanisms for weight gain and cardiometabolic disease. The CTRC pilot award funding allowed Dr. McHill to test two cohorts 1) newly-hired bus drivers as they transition to early morning or late-night shiftwork, and 2) OHSU nurses as they transition from day to night shiftwork, because this population does not also become sedentary during the transition. In part due to the data collected through this pilot award, Dr. McHill converted his K01 into an NIDDK R01 which continues to build on this research.

EDUCATION

BIP Commercialization Readiness Program (CORP)

BIP Corp provides biomedical scientists, clinician scientists, and engineers with a new approach to accelerate the translation of discoveries from lab to clinical practice. Based on the National Science Foundation's Innovation Corps (I-Corps™) program, the premier federally-funded innovation and commercialization training in the U.S., BIP Corp is an evidence-based experience that guides innovators out of their comfort zone to connect with potential customers to develop a competitive business case for future funding, partnership, and translational science opportunities.

In 2021, this experiential course affiliated with the CTSA-led I-Corps@NCATS consortium, bringing access to nationally recognized innovation experts and greatly strengthening our offerings. Since 2018, BIP Corp has advanced **46** biomedical technologies through hands-on entrepreneurial skill building activities: customer discovery interviews, commercial viability assessment, business case development, and networking with seasoned entrepreneurs.

BIP Corp Outcomes



110 scientists



51
Technologies
Advanced



9
Participating
Institutions



8
Startups
Formed



\$9.5M+
Follow-on
Funds Raised

INVENT Speaker Series

The INVENT Speaker Series hosts experts from the regional life science community to introduce fundamental principles of commercialization and entrepreneurship. These events aim to inspire and guide innovations from the university to the market, offer skill-building opportunities, develop a broad awareness of the commercialization pathway, and create robust networking opportunities. We intentionally select experts and founders from diverse backgrounds so participants see themselves in our speakers and learn from diverse perspectives. Since 2019, OCTRI has hosted **6** INVENT seminars delivering content to over **350** attendees.

100% of participants found the information presented useful.

91% increased their confidence in pursuing innovation and/or commercialization.

92% believed the seminar provided new insights into the innovation and/or commercialization process.

100% are interested in attending future Invent Seminars.

“Very engaging. Great panelists and questions. I came away with a much better understanding of what it would take to successfully launch an idea and am excited to give this a try.”

– INVENT participant

“This program definitely affected my entrepreneurial mindset in a positive way. It made me understand that learning customer needs would save you a lot of time, energy, and finances in business.”

– 2022 BIP Corp Innovator

INVENT Speaker Series Topics:

- FDA and Regulatory Landscape
- Market Research Deep Dive
- Customer Insights
- Alternative Funding for Entrepreneurs
- Pursuing Needs-Based Innovations
- SBIR/STTR Insights and 1:1s with NCI Program Directors

OHSU Invent-a-thon

Developed in partnership with MIT Hacking Medicine and with support from more than 50 academic and industry partners, the OHSU Invent-a-thon coalesced hundreds of innovators worldwide. Participants formed interdisciplinary teams, bringing together different backgrounds, universities, and fields to identify the biggest problems in delivering medical care, and to think outside traditionally siloed research facilities and industries to develop innovative solutions.

Forty-nine teams, chasing solutions to pressing healthcare challenges in health equity, surgical care, early disease detection, rural health, and management of chronic conditions made it through the weekend and pitched their solutions to panels of expert judges to compete for \$28,000 in prizes. All teams had the opportunity to connect with follow-on support from partners at OHSU and beyond and to compete for additional funding at the OHSU Invent-a-thon post-hack event in Spring 2021.

Led by the OHSU Department of Surgery and OCTRI, this event brought together 22 sponsors and 43 regional organizations.

The infographic shows a six-step process: Pitch Problems (140 probs) → Form Teams → Brainstorm Solutions → Receive Feedback → Iterate (49 teams) → Pitch Solutions. It highlights \$28,000 in prizes and 15 winners. Below, it lists partners: Oregon Health & Science University (43 team members from 24 depts & offices) and External Partners (20 team members from 13 companies/institutions). A table on the right lists event statistics.

Accepted participants	461
Accepted mentors	94
Steering & implementation team	63
Volunteers	44
Judges for four tracks	26
Keynote speakers	5
Sponsors	22
In-kind sponsors	43

Invent Oregon

Invent Oregon is an exciting competition for college and university students with ideas for inventions to address today's most pressing problems. Students are empowered through mentorship and education to see themselves as innovators and receive up to \$2,500 in development grants to take their concept from an idea to a working prototype. Selected teams advance to compete for up to \$30,000 in cash awards in the statewide Invent Oregon Finals.

Program goals include:

- Develop an effective pitch for a broad audience
- Understand the basics of bringing a concept from idea to market
- Gain practical experience developing an idea into a tangible outcome
- Connect with expert innovators and mentors from across the region



Avathamsa Athirasala, a Ph.D. candidate in OHSU Biomedical Engineering, competed in the 2020 InventOR finals for Microcosm, a high throughput screening platform for cell response to microenvironmental conditions.

DMICE Hack-a-thon

OCTRI and Eilis Boudreau, M.D., Ph.D., Assistant Professor of OHSU Department of Medical Informatics & Clinical Epidemiology held an international hackathon-style event for bioinformatics and computational biology students at OHSU and the University of Oslo's Institute of Health and Society.

Fifteen students, on multi-disciplinary teams from countries all over the globe, including Pakistan, Bangladesh, Taiwan, USA (UT Texas), England, and South Korea, used data from the National Sleep Research Resource to study sleep quality and its effect on economic development in emergent nations. Teams developed pitches for translatable solutions, including process improvements, algorithms, interventions, technologies, and services.

TRANSLATIONAL ALL-STARS



Dr. Bertassoni received a BIP award for his research on alternative root canal therapy and has since used OCTRI support for two additional technologies.

Luiz E. Bertassoni, D.D.S., Ph.D.

Associate Professor and Director
Division of Oncological Sciences,
Knight Cancer Institute

Cancer Early Detection Advanced Research
(CEDAR), Knight Cancer Institute

Department of Biomedical Engineering,
OHSU School of Medicine

Oral Rehabilitation & Biosciences,
OHSU School of Dentistry

Dr. Luiz Bertassoni received a 2018 BIP award to support the early stages of developing an alternative root canal therapy that could regrow dental pulp degraded by caries (tooth decay). Subsequently, his lab began developing two additional technologies that received OCTRI support.

OCTRI Support

- 3 BIP Device, Diagnostic, & Software, and Drug Discovery awards
- BIP Commercialization Readiness Program

Outcomes

- Company formation (Humarrow and RegendoDent)
- 7 journal articles
- Industry and academic partnerships (\$400,000)
- R21 (NIH grant support for conceptual project development) (\$421,970)
- R01 (NIH grant support for projects with strong preliminary data) (\$3,000,000)
- 3 patents filed
- Pending Department of Defense grant



Dr. Tilden successfully leveraged initial BIP funding and program support to build infrastructure to address maternity health systems improvement research.

Ellen Tilden, Ph.D., CNM, FACNM

Associate Professor, School of Nursing
Associate Professor of Obstetrics and
Gynecology, School of Medicine

A midwife and researcher, Dr. Ellen Tilden's research addresses maternity health systems improvements to decrease maternal morbidity and mortality, with a particular focus on prenatal care, labor progress, cesarean reduction, and maternal mental health.

OCTRI Support

- BIP Digital Health award (\$30,000)
- Mobile Apps for Clinical Studies award (\$5,000)
- BIP Commercialization Readiness Program

Outcomes

- STTR award (\$416,000)
- IDEA Gap funding (\$40,000)
- JTMF Foundation funding (\$200,000)
- Company formation (CenterM)
- IDEA Startup funding (\$15,000)
- Smartphone-based app successfully supported 18-patient labor study

2019-2023 AWARDEES

Biomedical Innovation Program

Devices, Diagnostics & Software

- Cristiane Miranda Franca, D.D.S., MS, Ph.D.,
Post-Doctoral Associate, Department of
Restorative Dentistry, School of Dentistry
*The Tooth on-a-Chip: a Microdevice for Development
and Screening of Dental and Oral Therapies*
- Matthew Hansen, M.D., MCR, Associate Professor
of Emergency Medicine and Pediatrics
Ultrasound Guided Vascular Access Assistance Device
- David Sheridan, M.D., MCR, Assistant
Professor of Emergency Medicine,
Jessica Grant, MS, CCC-SLP, CNT, Neo-natal
Speech Pathologist, Rehabilitation Services
Koala Cushion (Feeding Positioner to Improve Reflux)
- Austin Peters, M.D., Associate Professor,
Department of Anesthesiology & Perioperative
Medicine, School of Medicine
*Self-Administered Palate Stimulation Device
for Non-Invasive Headache Relief*
- David Warner, M.D., Research Resident,
Department of Surgery, School of Medicine,
Albert Lwin, M.D., M.P.H., Research Resident,
Department of Surgery, School of Medicine
*A Novel Doppler Transducer for Continuous Telemetry
Monitoring of Peripheral Vascular Signals*
- Elise Erickson, Ph.D., CNM, Assistant Professor,
Midwifery Division, School of Nursing
*Deciphering the Due Date-using A.I. to
Predict and Improve Childbirth*
- Xin Li, Ph.D., CNM, Associate Professor,
Advanced Imaging Research Center
Improving Practical Activity MRI Quantification
- Yali Jia, Ph.D., FAIMBE, Associate Professor of
Ophthalmology & Biomedical Engineering,
Jennie P. Weeks Professor of Ophthalmology,
Associate Director of Center for Ophthalmic
Optics & Lasers, Casey Eye Institute
*COOL-ART-DR, a Comprehensive Diabetic
Retinopathy Reading Platform Based on OCT
Angiography and Artificial Intelligence*
- Martin Pike, Ph.D., Associate Professor,
Advanced Imaging Research Center
*Development of Activity MRI (aMRI):
Direct Comparison to PET*
- Gregory Landry, M.D., Professor and Chief
of Vascular Surgery, Department of
Surgery, OHSU School of Medicine
*Smart Socket: A Novel and Dynamic Microprocessor-
controlled Pneumatic Socket that Optimizes
Prosthetic Fit via a Smartphone Application*

- David Huang, M.D., Ph.D., Peterson Professor of
Ophthalmology, Professor of Biomedical Engineering
*Novel Riboflavin and Oxygen Delivery Methods for
Transepithelial Corneal Collagen Crosslinking*
- Albert Chi, M.D., Associate Professor of Surgery,
Division of Trauma, Critical Care and Acute
Care Surgery, School of Medicine,
Xiao-Yue Han, M.D., General Surgery Resident
*Hyperspectral Imaging for Advanced Diagnostics
(HIAD): Deep Learning in Surgery*

Drug Discovery

- Summer L. Gibbs, Ph.D., Associate Professor,
Biomedical Engineering
*Near Infrared (NIR) Nerve-Specific Probes
Enable Improved Surgical Outcomes*
- Luiz Bertassoni, D.D.S., Ph.D., Associate
Professor of Restorative Dentistry
*BoneMimetics - A Drug Discovery Platform
for Bone-related Therapies*
- Michael Cohen, Ph.D., Associate Professor,
Department of Physiology & Pharmacology
*Allosteric Modulation of PARP1-DNA Binding with
Small Molecule Inhibitors: A Potential Therapeutic
Strategy for Treating Ewing Sarcoma*
- Raymond Bergan, M.D., Professor of Medicine;
Associate Director, Medical Oncology,
OHSU Knight Cancer Institute
Ryan Gordon, Research Assistant Professor of Medicine
*Development of Dual Acting Bone Defending
Agents, Expanded Toxicology Assessment*
- John Brigande, Ph.D., Associate Professor of
Otolaryngology; Associate Professor of Cell,
Developmental, & Cancer Biology
*Generation of a Mouse Model Susceptible to
SARS-CoV-2 Infection by i-GONAD*
- Nabil Alkayed, M.D., Ph.D., Professor of Anesthesiology
and Perioperative Medicine; Director of
Research, Knight Cardiovascular Institute
*A Novel Therapeutic Target in
Subarachnoid Hemorrhage (SAH)*
- Mallesh Pandrala, Ph.D., Assistant Staff Scientist
at the OHSU Knight Cancer Institute's
Center for Experimental Therapeutics
*Development of a Pan-BCR-ABL Inhibitor for Chronic
Myeloid Leukemia with Improved Safety*

Drug Discovery (Continued)

Sanjay V. Malhotra, Ph.D., FRSC, Professor & Endowed Chair in Cancer Research, Department of Cell Development & Cancer Biology, Director, Center for Experimental Therapeutics, Knight Cancer Institute

Addressing Paclitaxel Resistance and Disease Progression in Ovarian Cancer with Small Molecule YBX1 Inhibitors

Sanjay V. Malhotra, Ph.D., FRSC, Professor & Endowed Chair in Cancer Research, Department of Cell Development & Cancer Biology, Director, Center for Experimental Therapeutics, Knight Cancer Institute

Developing a Novel Drug to Combat Triple Negative Breast Cancer Progression Through Metabolic Modulation

Jonathan Pruneda, Ph.D., Assistant Professor of Molecular Microbiology and Immunology, School of Medicine

Ruth Napier, Ph.D., Assistant Professor of Molecular Microbiology and Immunology, School of Medicine
Principal Investigator, VA Portland Health Care System

Sanjay V. Malhotra, Ph.D., FRSC, Professor & Endowed Chair in Cancer Research, Department of Cell Development & Cancer Biology, Director, Center for Experimental Therapeutics, Knight Cancer Institute

Small Molecule Restoration of UBA5 to Treat Early-Onset Neurodegenerative Disease

Digital Health

Peter Schulman, M.D., Professor of Anesthesiology and Perioperative Medicine, School of Medicine

Novel Artificial Intelligence Algorithm to Automatically Detect, Diagnose, and Determine the Severity of Cardiac and Pulmonary Disease

Ellen Tilden, Ph.D., CNM, Assistant Professor, School of Nursing; Assistant Professor of Obstetrics and Gynecology, School of Medicine

Preventing Postpartum Depression: Combining Content Delivery and Data Capture

COVID-19

Albert Chi, M.D., Associate Professor of Surgery, Division of Trauma, Critical Care and Acute Care Surgery, School of Medicine

OHSU 3D Printed CRISIS Ventilator

Bory Kea, M.D., M.C.R., F.A.C.E.P., Associate Professor, Department of Emergency Medicine, Director of Clinical Trials, Department of Emergency Medicine

Evaluating the Use of Brown Paper Bags for Storage of Limited Re-usable PPE Exposed to SARS-CoV-2

Fikadu Tafesse, Ph.D., Assistant Professor of Molecular Microbiology and Immunology, School of Medicine

SARS-CoV-2 Nanobodies as Therapeutics Against COVID-19

Robert Eil, M.D., Assistant Professor, Division of Surgical Oncology, Cell, Developmental & Cancer Biology

Safe Application of CAR-T Cells for the Treatment of Solid Cance

CTRC Career Development Award Support

Elise Erickson, Ph.D., CNM, Assistant Professor, School of Nursing

Oxytocin Receptor DNA Methylation and Postpartum Maternal Outcomes

Lisa Karstens, Ph.D., Assistant Professor, Medical Informatics and Clinical Epidemiology, School of Medicine

Urinary Microbiomes: Do They Play a Role in Urgency Urinary Incontinence?

Andrew McHill, Ph.D., Assistant Professor, School of Nursing

SHIFT: Safety & Health Involvement for Truck Drivers

Lindsey Wooliscroft, M.D., Assistant Professor, Neurology, School of Medicine

Aerobic Exercise to Improve Mobility in Multiple Aclerosis: Optimizing Design and Execution for a Full-Scale Multimodal Remyelination Cinical Trial

Hanna Gustafsson, Ph.D., Assistant Professor, Psychiatry, School of Medicine

Prenatal Environment and Child Health (PEACH) Study

Pathways to Independence

Miranda Lim, M.D., Ph.D., Associate Professor, Neurology, Pulmonary and Critical Care, School of Medicine; Research Investigator, Portland Veterans Affairs Medical Center

Supplementation with Amino acid Rehabilitative Therapy in TBI (SmART-TBI): A Randomized Placebo-Controlled Trial to Improve Sleep and Cognition.

Strategic Investment Funds

Xinbo Li, Ph.D., Assistant Professor, Opthamology, Casey Eye Institute

Gap Junction and Cell Development of Eye

Thank You OCTRI Reviewers!

Jen Akeroyd
Bridget Adams
Rob Arnold
Philip Barish
Juan Barraza
Tom Barrett
Teresa Bennett
Terri Butler
Anne Carlson
Charla Triplett
Travis Cook
Leah Davidson
Ann Demaree

James Dirksen
Rachel Dreilinger
Laura Erker
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To learn more about OCTRI Innovation Programs & Awards please visit:

Pilot Award Funding: <https://www.ohsu.edu/xd/research/centers-institutes/octri/funding/>

Biomedical Innovation Program: <https://www.ohsu.edu/octri/biomedical-innovation-program-academia-marketplace>

Innovation and Entrepreneurship: <https://www.ohsu.edu/octri/innovation-and-entrepreneurship>

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