

Research Advancement in the School of Medicine

2015 – 2016 Highlights



School of
MEDICINE

In this past year, OHSU made tremendous progress in research. We oversaw the development of enabling technologies, recruitment of immensely talented faculty and the appointment of world-renowned experts to lead our departments and research programs. New collaborations were established that brought together scientists, clinicians and cutting-edge instruments.

In the midst of this promising year, we also experienced staggering loss with the death of our Dean, Mark Richardson—a brilliant leader and a tireless advocate for research. Mark Richardson believed that our most powerful advantage is the collaborative spirit of our faculty—a spirit that fuels innovation. He invested in faculty first and foremost—to do their best work, be creative and make new discoveries. He conceived a new way to support faculty, the researcher compact, which stabilized research and enabled more science to take place. Mark stimulated innovation by supporting faculty in the use of core technologies and infrastructure. He invested in new junior- and mid-level faculty because he believed this critical next generation would drive discovery that leads to health impact.

Though not planned, among Marks' final contributions to the school was his endorsement of Dr. John Hunter to succeed him as interim dean upon, what Mark had intended as, his retirement in December. Dean Hunter is already showing his commitment to invest in and further our research mission.

During this upcoming year many great opportunities lie before us. We will build a bold vision together. We will align our research strategies across departments and disciplines, across technologies and areas of expertise. By building this vision together, we will ensure a future for research that is rich with discovery and more successful than ever before.



Mary Stenzel-Poore, PhD
Senior Associate Dean for Research
School of Medicine

A Vision for Research

By 2016, the OHSU School of Medicine will be recognized globally for excellence in scientific discovery, collaboration and the rapid translation of new knowledge into practices that improve human health.

In 2010, the School of Medicine developed a vision for research to help guide how we build our expertise, partnerships, and ultimately translate discovery to benefit human health. This was a great beginning to our strategic efforts and reflected our specific intentions to build research in a coordinated manner.

In the 2015-2016 fiscal year, we made new investments and commitments to ensure that we have the right expertise, supportive infrastructure, emerging technologies and strategic partnerships that can advance the outcomes and application of research at OHSU.

This report highlights achievements in several key areas that include faculty expertise, research capacity, innovation in education and strategic partnerships.

This report also reflects the extraordinary involvement of our dedicated and passionate research faculty who have worked tirelessly to achieve our research vision.

- 1) Development of Faculty Expertise
- 2) Expansion of Research Strengths
- 3) Innovation
- 4) Cultivation of Strategic Partnerships
- 5) Future Perspectives

Development of Faculty Expertise

We have made significant investments in faculty that cross the boundaries of department affiliation and discipline. These co-recruitments fuel collaboration and deep knowledge sharing.

Significant recruitments include new research leaders across the School of Medicine in FY16. Our new leaders along with many other leaders in the SoM are committed to a strong vision for research that includes recruitment of a diverse faculty of promising junior and mid-level researchers.

New Leadership



Sadek Esener, PhD
Director
Center for Early Detection
Research



Marc Freeman, PhD
Director
Vollum Institute



Carsten Schultz, PhD
Professor & Chair,
Physiology &
Pharmacology



Bitia Moghaddam, PhD
Professor & Chair
Behavioral Neuroscience

Faculty Advancement

Across the School of Medicine 82 faculty members were promoted or appointed over the past year, distinguishing themselves across multiple domains in accordance with the school's promotion and tenure guidelines. The promoted faculty represent 23 of the school's 26 departments. Forty-four faculty members were promoted to the level of associate professor and 23 to the level of professor.



Diverse Perspectives

New faculty from diverse backgrounds have joined the SoM.

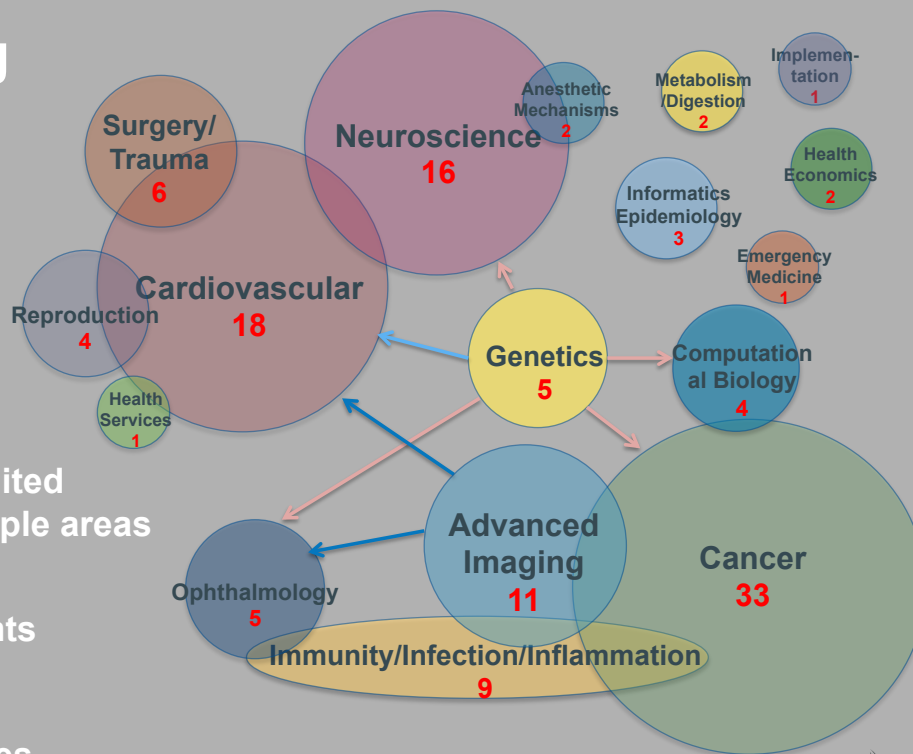
Dr. Fikadu Tafesse stood out among the candidates in a national search for a new junior faculty member in the department of Molecular Microbiology and Immunology. Dr. Tafesse is a talented biochemist whose research interests in tuberculosis (TB) aligned with OHSU's emphasis on infection and immunity and global health.

Fikadu Tafesse was raised in Goba, the one significant settlement in the Bale mountains in southern Ethiopia. As one of 12 children growing up on a farm in rural Ethiopia, the educational opportunities were very limited in a country recovering from famine and civil war. Tafesse's career trajectory is truly inspiring – from Goba to Germany and on to the Netherlands supported by a scholarship to complete his PhD in lipid biochemistry. He went on to become an infectious disease research fellow at the Ragon Institute of MGH, MIT and Harvard.

Dr. Tafesse will broaden our cultural awareness, provide a distinct and powerful perspective to problem solving and community development. Having Fikadu in our midst provides a model to others and will attract diverse faculty, students, postdocs and staff alike to our institution.

Areas of intersecting emphasis

- 100 faculty recruited (many with multiple areas of emphasis)
- 51 co-recruitments
- 42% are women
- 14% are minorities



Planning for the visit of NIH Director Francis Collins began in early FY 16 (here pictured with SoM Interim Dean John Hunter on October 24, 2016).

Dozens of research faculty were involved with the Director's visit.



Kent Thornburg at TEDxPortland on July 28, 2015.

Research Advocacy

Powerful advocacy for research is an imperative to our success. Our ability to provide coordinated, cohesive responses to our federal funding agencies strengthens our position in the national research arena, which is a primary goal of the SoM.

Over the last year specific attention has been given to the development of the voice of faculty as research advocates locally and nationally. Faculty have been given a deeper understanding of OHSU's research strengths along with key talking points on the economic impacts of research.

The next year will include a continued focus on providing the training and messaging that researchers need to be effective advocates for their own research, and for research in general.

Expansion of Research Strengths

We continue to strengthen our science, enhance our collaborations, and maximize our impact through thoughtful, informed and visionary planning around research strengths. A few highlights from the year include a focus on neuroscience, imaging and clinical research.

Neuroscience

A cohesive and unifying vision for research in neurodevelopment, neurodegeneration and brain injury has emerged from the efforts of many neuroscience faculty and leaders during the past two years. The focused planning has allowed researchers from diverse perspectives and practice to envision a coordinated, stronger approach to the most critical areas of neuroscience research and care.

One example of these important planning efforts is the preliminary vision to develop strong expertise and technologies that facilitate a deep biological understanding of how neural function is altered throughout development in children suffering from neurodevelopmental disorders, and how neurodevelopmental markers inform risk for later-emerging mental illness.

Imaging Science

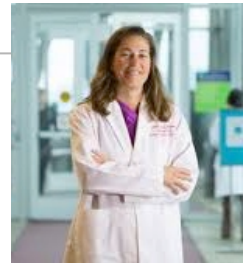
Precision medicine will enter the clinics and practices on a broad level within the next five to ten years. By then, new imaging technology is mandatory to help physicians make the best decisions. OHSU is investing in a range of state-of-the-art visualization equipment and new faculty expertise to perform advanced imaging research.

The full optimization of imaging capabilities requires *integration* across size scales, through interfacing technologies and computing solutions. Multi-disciplinary collaboration from basic to clinical science enables the development of novel solutions and technological breakthroughs for scientific advancement. Such advancements will power precision medical care at OHSU.

Clinical Research

Two of our newest research leaders bring audacious goals to build new interdisciplinary programs that translate discovery into patient care.

Jennifer DeVoe, MD, DPhil, Professor and Chair of Family Medicine, has a vision for primary care transformation, innovation, and discovery through patient engagement and the use of communities as learning systems for health. She leads a multidisciplinary research team with expertise in informatics, sociology, epidemiology, biostatistics, economics, primary care, mental health, health-services research, clinical medicine, health-care disparities and anthropology. Research findings will inform community practice and policy interventions that help to improve the delivery of care for vulnerable populations and eliminate health disparities.



Sancy Leachman, MD, PhD, Professor and Chair of Dermatology launched the War on Melanoma program, which has an ultimate goal of cutting the number of melanoma deaths in Oregon in half in five years. The program approach requires a focus on early detection with an emphasis on population science and an adaptive program model that measures progress towards developing the best care possible through science, clinical research and clinical care. Leachman was recently appointed the inaugural recipient of the John D. Gray Endowed Chair in Melanoma Research by the OHSU Knight Cancer Institute due to her contributions in the field of melanoma research.



Innovation

A number of initiatives to foster innovation were offered that provided opportunities for both research faculty and learners. In addition, the School underwent a thorough consideration of the future of doctoral education to meet the needs of the next generation of biomedical researchers.

Innovation Fund

Support for cutting-edge and critical data for grant submissions is essential to ensure success of our investigators.

In response, the School of Medicine Office of the Dean established an innovation fund to subsidize fees associated with the use of OHSU cores to develop pilot data for grant submissions for investigators.

INNOVATION FUND	FY14 - FY16
\$ Approved Faculty Awards	827,051
# Approved Faculty Awards	162
SOM Departments/Units with New Awards	33
Faculty from BSC Depts	56
Faculty from Clinical Depts/Institutes	106
\$ Research Core Billings	589,721
# Research Cores Utilized	23

PhD Transformation

The SoM launched the IDEAS (Innovating Doctoral Education for Aspiring Scientists) committee, which is charged with gathering faculty and student input to create a vision for the future of doctoral education in the School of Medicine. The committee has articulated that our future graduates should be critical and creative thinkers as well as successful collaborators across multidimensional research teams. They should lead in a myriad of diverse careers. To accomplish this, our education programs must support the unique, interdisciplinary, development of each student. The committee will soon make recommendations for a more flexible and multi-disciplinary Ph.D. Program that is founded on the principles of mentorship, community, and scientific excellence. The full report will be made available in January 2017 and Graduate Studies leadership will shape a final plan with the intention of offering the new program to students for Fall 2018.

B.E.S.T Program

In addition, the proposed new program for PhD trainees, the Oregon's BEST (Broad Experiences in Scientific Training) program will attract some of the nation's best students to pursue a curriculum that includes systems and design thinking to fuel innovation as well as critical elements of entrepreneurship, team science and communication strategies to enhance trans-disciplinary problem solving.

Equity and Internship Programs

The OHSU Center for Equity and Inclusion Summer Equity Research program, Ted R. Lilley Continuing Umbrella of Research Education (CURE), and Cell, Developmental & Cancer Biology partnered to offer summer internship programs attracting undergraduates and high school students to experience research and educational opportunities at OHSU. Students worked with faculty mentors in a research and clinical setting.

FY16 RESULTS

15 women
5 underrepresented minorities
out of **22** available spots

Cultivation of Strategic Partnerships

Research faculty provided insight on the criteria that must be met to ensure powerful and sustainable collaborations.

Strategic partnerships should:

- Fill an unmet need in healthcare, research, and education.
- Advance our leadership position.
- Create an ecosystem that can be leveraged into new opportunities.
- Exhibit shared commitment, vision, and complementary culture.

FY16 Partnership Highlights



Intel

- Expansion of the *Collaborative Cancer Cloud*, a computational platform co-developed with Intel, two new partners Dana Farber Cancer Institute & Ontario Institute for Cancer Research. Research teams have received ongoing support from Intel and strong promotion at national events *Intel Developer Forum & Intel Cloud Day*.
- Knight Cardiovascular Institute & Intel's collaborative *You 24x7 Cardiovascular Wellness Study* yielded unprecedented data from wearables. Showcased at *Healthcare and Information Management Systems Society 2015 Annual Meeting*.



FEI

- Single-particle cryo-electron microscopy performed in the *OHSU-FEI Living Lab* elucidated previously unknown structures of neurotransmitter receptor complexes. Published in *Nature* and *Cell*.



Pacific Northwest National Laboratory

- OHSU and PNNL were awarded the NIH Undiagnosed Disease Network Metabolomics Core (\$1.8 M, 3 yrs).
- *OHSU-PNNL Northwest Co-Laboratory for Integrated 'Omics* investigators have 16 collaborative investigational projects underway in metabolomics and proteomics.
- Two grant proposals submitted with OHSU's Dr. Michael Hutchens "Nanoscale proteomics of glomerular filtrate". (Applications pending review.)
- Jointly-authored manuscript "Metabolic changes in fetal hearts exposed to intrauterine growth restriction" (in preparation).



Immunovia, Boston Biomedical and the Pancreatic Action Network

- The Brenden-Colson Center for Pancreatic Care has a multi-partner ecosystem creating a robust approach to develop an atlas of pancreatic disease.

Partnerships on the horizon...

- 3M – Leaders at OHSU met to discuss promising opportunities in simulation lab, critical care & wound care.
- OSU, PNNL, Karolinska – Exposome studies are under discussion to understand early development of neurobehavioral deficit.
- Under Armour, PNNL, Amazon Gaming – Assessing quantitative tools for neurobehavioral deficit diagnosis/prognosis using sensors, eye tracking, software, data integration.
- UCSD, Intel – Exploring co-development of neuroimaging tools (data processing, analytics, data management, software).
- Intel, Nike & other local industry – Engaging employees for SPARK initiative recruitment, targeting 3,000 autism-afflicted families.

Strategic Partnerships Team



Barbara Burkart, MBA, MA
Director of Strategic Partnerships
School of Medicine



Aditi Martin, PhD
Associate Director
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Terence Lo, PhD
Senior Alliance Manager
School of Medicine



Trish Pruis, PhD
Alliance Manager
Strategic Partnerships &
Brenden-Colson Center for
Pancreatic Care

Future Perspectives

Faculty Vision for the Future

The School of Medicine places extreme value on the expertise of the research community. The voice of our faculty guides new directions for a successful future.

Regular input from faculty is essential. To this end, a number of regular forums are held that bring faculty together for discussion of important research topics. Monthly meetings of research leaders (Collaborative Research Leadership Group) provides a valuable forum to deliberate emergent initiatives that impact the research community. Faculty-led task forces provide a more in-depth exploration on ways to develop our research strengths and support researchers and learners. These task forces develop and provide recommendations to School of Medicine leadership.

In addition, the Basic Science Council was convened to give input into research direction. The council is comprised of the basic science department chairs as well as three program directors, Joe Gray, Ph.D., director of the OHSU Center for Spatial Systems Biomedicine, Adam Margolin, PhD, director of Computational Biology and Sadik Esener, Ph.D., director of the Knight Cancer Institute's Center for Early Detection.

In FY 16 research faculty developed recommendations for a number of topics, including:

- **Partnership Ecosystem** with TTBD and the Oregon Translational Research and Development Institute (OTRADI)
- **Institutional Commitments** for Technology and Research Capacity
- **cGMP Infrastructure**
- **Innovating Doctoral Education** for Aspiring Scientists (IDEAS)
- Supporting **Physician Scientists**
- Improving **Onboarding** for Research Faculty
- **Unconscious Bias** Training for Faculty



Women Research Leaders strategy session in April 2016.



Collaborative Research Leadership Group (CRLG) in May 2016 discussing strategies to support physician-scientists.

What We Have Built



Research planning retreat at Skamania Lodge in 2010. Led by Mark Richardson, Dean of the School of Medicine,

The 2010 School of Medicine Research vision provided a new roadmap for strategic development of emerging areas of research. OHSU has invested boldly in the power of innovation and discovery—over \$150 million has been invested in research in the past 5 years, with more than \$50M of this for basic science and other research recruitments. These investments and initiatives have dramatically changed the research landscape at OHSU.

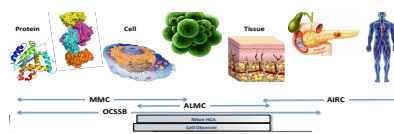
Brenden-Colson Center for Pancreatic Care
 Knight Cancer Institute
 Knight Cardiovascular Institute
 Moore Institute for Nutrition & Wellness



Collaborative Life Sciences Building



Knight Cancer Research Building



Center for Spatial Systems Biomedicine

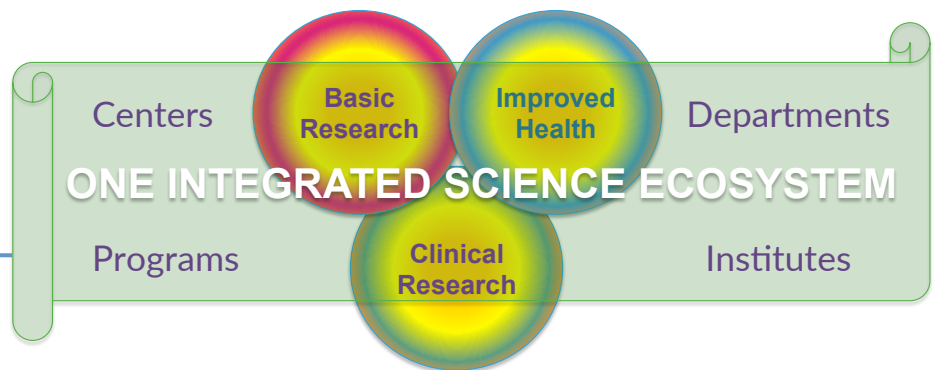


Center for Radiochemistry Research

Reaching the Next Level

The School of Medicine is ready to move to the next level of strategic growth in research. To do this well, we must build research visions that are aligned with our true strengths and technological capabilities. Together we can create a powerful vision that is built on collaboration and the unique capabilities found in each and every department and across OHSU.

Research Mission



Integration of Research Across OHSU to Elevate All Research

