

Oregon Institute of Occupational Health Sciences

2015–2016

Biennial Report

Our Mission

Your health doesn't exist in isolation from your work. The air you breathe, the food you eat, the quality of your sleep, your access to exercise, the likelihood of you succumbing to illness or injury due to work — are all affected by your working life.

That's why we are here. Since 1988 we have stood firmly at the intersection of the workplace and wellbeing. We are a nationally recognized team of scientists, and our work stretches from molecular-level research, to clinical studies, to programs in the workplace. We are dedicated to making a significant contribution to human safety, health and wellbeing.

At Occupational Health Sciences, we are applying research discoveries, integrating workplace safety, health and wellbeing, and we're creating actionable strategies to support the whole health of workers.

Together with our network of partners, we are setting the stage for a thriving workforce and better health in Oregon and beyond.

TABLE OF CONTENTS

Our Mission 2

A Message from Our Director 3

Our Areas of Emphasis 4

Highlights

- Total Worker Health 6*
- Sleep and Shift Work 12*
- Exposure: Consequences and Prevention 16*
- Injury, Treatment, Recovery and Prevention 21*
- Outreach and Education 22*
- Summer Internships 26*

Faculty Presentations 27

Publications 30

Grants Funded 35

Financial Statements 37

About Us 39



A Message from Our Director



Steven A. Shea PhD

I am proud to present the 2015-16 Biennial report for the Oregon Institute of Occupational Health Sciences. We strive to help both workers and their companies by focusing on combined healthy and safe practices at work. The ultimate goal is to avoid disease and accidents and to actually improve the overall health of the workforce. We do this through research in laboratories, conducting interventions in the workplace, and providing outreach and education to the community. To this end, we have faculty experts performing research in many areas, and other programs, consultative and online resources including:

- Oregon Healthy Workforce Center (OHWC)
- Occupational Health and Safety Resource Center
- Toxicology Information Center
- Occhealthsci.org - our web resource site
- Oregon Occupational Fatality Assessment and Control Evaluation (OR-FACE)
- Oregon and the Workplace blog

We receive funds from the State of Oregon and from local and federal grants and contracts (mostly the National Institutes of Health) and have well over 50 employees who help us achieve our mission. We also have wide reach with numerous collaborations with partners across campus, across Oregon, across the country and across the globe (see map on page 4). The Institute's faculty and staff are devoted and successful professionals. I commend them all for their hard work. Their main activities and accomplishments are described in the following pages of this biennial report. We also encourage you to visit our informative websites, follow us on Twitter and Facebook and our Blog, and to read this online — as there are active hyperlinks to informative videos that show our work visually.

Our many endeavors are highlighted throughout the biennial report and exemplified by our list of publications, awarded grants, honors and significant presentations. But, there are some other highpoints that do not appear in the formal report but which also demonstrate the impact of our work. For instance, (i) The Oregon Healthy Workforce Center successfully renewed a multi-million dollar 'Center of Excellence' grant from the National Institute for Occupational Safety and Health to perform research on the effectiveness of workplace interventions aimed at improving safety, health and wellbeing; (ii) Our faculty have a growing national and global impact as exemplified by over 80 invited presentations across 17 states and 6 countries; (iii) We recruited two new faculty members: Leslie Hammer, PhD, a Professor in the Department of Psychology at Portland State University, Director of the Center for Work-Family Stress, Safety, and Health and an energetic leader in the field of Occupational Health Psychology, and David A. Hurtado, ScD, ScM, Research Fellow from the Harvard School of Public Health and an expert in social epidemiology whose goal is to evaluate how the work environment impacts the health and wellbeing of workers, families and organizations.

Finally, the successes of our Institute and of our faculty members and staff, are assessed mostly by traditional internal and academic metrics, such as number of presentations, number and quality of our publications, and our funding successes. While those metrics are impressive academically and underscore our already excellent and improving reputation, in the coming year we will also begin to assess and present additional meaningful metrics, such as adoption of successful programs by workforces across Oregon, and the effect of our interventions on safety and health outcomes. Thus, watch this space, and in the meantime, apart from reading this biennial report, we invite you to contact us to determine how we can help your occupational health needs.

Respectfully submitted,

Steven A. Shea, Ph.D.
Director

Our Areas of Emphasis

Education and Outreach

Our Education and Outreach Programs have four goals:

- Provide scientifically accurate information about Oregon's occupational safety & health issues — continuously on the internet and through the Toxicology and Occupational Health Information Center (TIC)
- Offer educational programs on Oregon's occupational needs to health and safety specialists, government, and medical providers
- Train health professionals who will investigate and resolve Oregon's occupational safety and health issues in the future
- Provide scientific expertise to help Oregon industry and labor evaluate occupational safety and health issues

See our education and outreach video at:

<http://tinyurl.com/Outreach-Education>

Research

The Oregon Institute of Occupational Health Sciences performs research at many levels, including basic laboratory science, human laboratory science, workplace interventions and outreach plus education. These programs are integrated, so that discoveries in one area inform and enhance the research and productivity in other areas. You can see an overview of the Oregon Institute of Occupational Health Sciences at: <http://tinyurl.com/OccHealthSci-Overview>.



You can learn more about our areas of emphasis by accessing the informative videos located at the URLs listed below.

Total Worker Health (<http://tinyurl.com/Occ-Health-Sci>)

Sleep and Shiftwork: Impact on Health, Safety, and Productivity (<http://tinyurl.com/sleep-night-shift-work>)

Exposure: Consequences and Prevention (<http://tinyurl.com/Exposure-Conseq-Prevent>)

Injury, Treatment, Recovery, and Prevention (<http://tinyurl.com/Injury-Treatment-Recov-Prevent>)

For a full list of videos from the Institute, visit: <https://tinyurl.com/y88qnzcw>

2016 Highlights

The Oregon Institute of Occupational Health Sciences brings federal dollars to the Oregon economy

We receive base operations funding from the Oregon Workers' Compensation System to achieve our mission, and we leverage these funds to obtain federal and other research dollars. On average, for every dollar invested in our mission by the State's Workers' Benefit Fund in 2015 and 2016, our scientists were awarded an additional \$1.56 of grant funding. Dollars for research in Oregon have a significant positive impact on the state. For example, expenditures for goods and services and the salaries of scientific and support personnel produce a multiplier effect on the economy. Moreover, our researchers collaborate with others from around the world, as shown on the map at right. Research coming out of the Institute can lead to new technologies and jobs as spin-offs from productive research.



From the OHSU Experts portal (<https://ohsu.pure.elsevier.com/en/>)

Total Worker Health®

Improving Workforce Safety, Health, Wellness and Wellbeing

Oregon Healthy Workforce Center (OHWC)

Established in 2011, the Oregon Healthy Workforce Center (OHWC), is a National Institute for Occupational Safety and Health (NIOSH) Center of Excellence in Total Worker Health®.

Ensuring a healthy worker necessitates a holistic view that is geared toward protecting the worker from workplace hazards as well as enhancing the employee's wellbeing at work and outside of work; this is the "Total Worker Health®" strategy.

Our work is focused on designing, developing, and disseminating effective Total Worker Health® interventions.



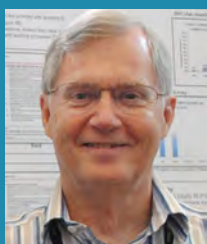
Oregon Healthy Workforce Center faculty and staff, October 2016



Total Worker Health® Interventions

Faculty members in the Institute of Occupational Health Sciences are developing, testing, and disseminating workplace intervention programs that integrate safety, health and wellbeing into single or associated programs that reduce injuries and improve wellbeing by improving work organization and individual behavior such as exercise while improving lifestyle behaviors and reducing stress.

(<http://tinyurl.com/Occ-Health-Sci>)



Dr. Kent Anger, Director of the Oregon Healthy Workforce Center (OHWC), is creating effective Total Worker Health (TWH) interventions to improve safety, health and wellbeing in the Oregon Workforce. The OHWC is a NIOSH-funded

Center of Excellence in Total Worker Health®. Dr. Anger's lab develops computer-based training that uses behavioral education principles for hazard prevention, skills acquisition, and wellbeing at the organizational and individual levels. The training is supported by practice activities that create new habits or desired changes in behavior. For more information about Dr. Anger's lab, visit: <http://tinyurl.com/Kent-Anger-Lab>

In 2015, the OHWC team conducted behavioral and organizational change interventions in multiple industries including construction, home care, health care, transportation and in broader cross-sections of the work force, including young workers. A major accomplishment of the OHWC was publishing the results of hypothesis-based research on TWH using strong (randomized trial) research designs and the development of tools and toolkits to disseminate those results; they are available at www.ohsu.edu/ohwc. The research team also successfully competed for renewed federal funding (2016-2021) of the

OHWC. Preliminary research to support the application was conducted at call centers (pictured), in transportation and in hospitals. The Center grant application was funded in September, 2016.

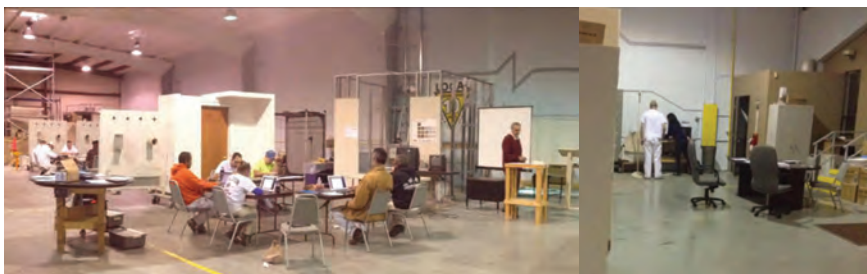


Dr. Anger (R) with research assistants Jason Kyler-Yano and Katie Vaughn

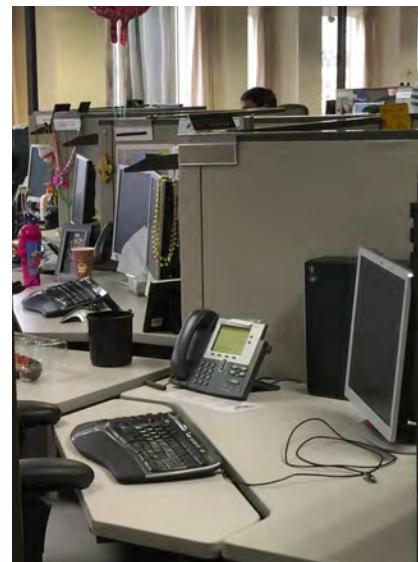
Dr. Anger concentrated on implementing TWH interventions in construction and agriculture, specifically in vineyards. A worksite intervention pilot study conducted in four Portland area construction companies provided evidence of improved knowledge, greater interaction between supervisors and employees, improved safety, health and wellbeing measures in employees and supervisors, and positive reactions and ratings of the intervention. The intervention was modified for use in agriculture and new wellbeing topics were added to expand the prevention and sustainability aspects of the team-based wellbeing education.

“The program was fun and there was lots of good information. I particularly liked how the staff delivered the program. I would recommend this to others including our main offices...” - Supervisor Training attendee

An example of a TWH session with surveys (left) and health data collection (right).



Call Center pilot study





Dr. David Hurtado was recently recruited from the Harvard T.H. Chan School of Public Health. He is a social and behavioral scientist who investigates social determinants of workers' health. In particular, Dr. Hurtado examines how work-time control, peer support and employment conditions contribute to occupational health and safety, especially in high-risk industries such as health-care. His research focuses on how modifiable workplace conditions relate to risk factors for mental illnesses, musculoskeletal disorders, and non-communicable diseases. You can learn more about Dr. Hurtado's work at: <http://tinyurl.com/David-Hurtado-Work-Time-Contro>

The Influence of Coworkers and Peers on Workplace Health

Peers influence health-related information, attitudes and behaviors at the workplace, and peer-based training has been shown to be effective for personal protective equipment and safety-related procedures. With seed funding from the Oregon Healthy Workforce Center and the Oregon Institute of Occupational Health Sciences, Dr. Hurtado is conducting pilot studies in preparation for extramural grants to develop effective peer-based programs that improve occupational health and safety. Dr. Hurtado and his lab innovate by applying Social Network Analysis to detect which workers and social relations are critical to influencing safer workplace norms and practices positively. The goal of this research is to develop interventions that build upon pre-existing supportive

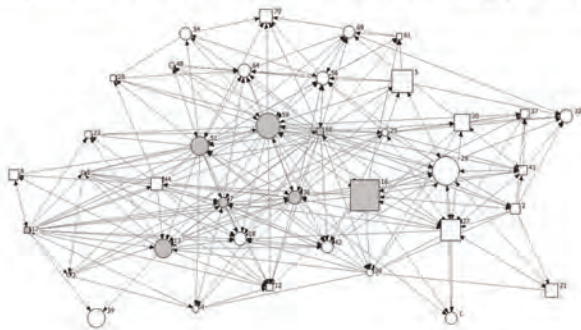
interactions among peers.

In 2016, Dr. Hurtado started research partnerships with two organizations to investigate how coworkers and workplace peers can make a positive difference in occupational health and safety. At the Samaritan Lebanon Community Hospital, Dr. Hurtado and his lab are developing a program to identify, train and evaluate the effects of nurses that champion safe patient handling and teamwork at their units. At the Multnomah County's Department of Community Justice, they will evaluate the mental health effects of a peer-based program that provides social support and stress management to parole probation officers. These two studies are expected to inform best ways to design and implement workplace programs based on supportive peer interactions.



Hurtado Lab (from L to R): Sam Greenspan, MPH, Yaritza Rodriguez, BA and Lisset Dumet, MBA. (November 2016).

Figure 1. Sociogram showing safe patient handling advice-seeking interactions. Circles indicate RNs and squares CNAs. Arrowheads show the direction of advice. Champion candidates are shown in grey. Size of the nodes reflect equipment use.



Dr. Hurtado speaking at a Work, Family Researchers' Network conference in Washington, D.C.



"...It (supervisory training) made me more aware of being a good role model to fellow coworkers and to also always be a good safety representative...I especially enjoyed the weekly meetings and the camaraderie shared by our team..." - Supervisor Training attendee

Workplace Interventions



Dr. Ryan Olson

Dr. Olson's research focuses on total worker health interventions for isolated workers like truck drivers and home care workers. His team also studies behavioral self-management methods.

Organizational and behavior change tactics he has studied include:

- Policy changes to reduce job stress
- Alterations of the sleeping environment for truck drivers
- Leadership training to increase supportive supervision
- Competition to increase healthy behaviors
- Support groups to promote workplace safety & health
- Motivational interviewing
- Behavioral self-monitoring

For more information about Dr. Olson's lab, visit: <http://tinyurl.com/Ryan-Olson-Lab>

Work, Family, and Health Network Study Improves Employee Sleep

With today's modern technologies and growth of knowledge-based work, the boundaries between work and non-work time are blurring. This can create stressful work-family conflict that harms worker health. Related to this problem, Dr. Olson led the publication of the flagship paper on sleep outcomes for the Work, Family, and Health Network intervention trial (the Institute's Leslie Hammer was a co-author and key leader in the overall project). This intervention aimed to reduce work-family conflict and improve employee health and productivity. The

approach involved a series of in-person training sessions for employees plus extra activities for supervisors to increase employee control over work time and increasing family supportive supervision. Dr. Olson collaborated with Dr. Brad Wipfli to develop the OHSU Enterprise App for iPhone/iPod Touch that was used by supervisors in the program to set goals and self-monitor their supportive supervisory behaviors. While the intervention did not overtly target sleep, increasing employee control over work time and family supportive supervision led to about 1 hour more sleep per week for intervention participants compared to control. This adds up to about a week's worth of full nights of sleep over the course of a year.

COMPASS Pilot Study Findings

Home care workers who care for society's most vulnerable citizens have limited safety and health support structures, and have elevated injury rates. With Diane Elliot at OHSU and Jennifer Hess from the University of Oregon, Dr. Olson developed and pilot tested the COMMunity of Practice and Safety Support (COMPASS) program for home care workers. COMPASS is a peer-led group program where workers meet regularly for shared learning, goal setting, and social support for solving problems and making changes. It was developed with input from the Oregon Home Care Commission and the Service Employees International Union Local 503, and is a research project of our Oregon Healthy Workforce Center. The COMPASS pilot test established the program as feasible and enjoyable, and workers showed large knowledge gains before and after meetings and reported making changes to safety and health behaviors.



Olson Lab @ OHSU

- interventions for lone workers
- self-management



"I thought it was amazing to be able to learn and share and get information from other people and help them when they need it, and they help me. I just thought it was great."

-Compass Program participant

Results of COMPASS Randomized Trial

In 2016 the results of the COMPASS randomized controlled trial were published (Ryan Olson with collaborators Diane Elliot and Miguel Marino at OHSU, and Jennifer Hess from the University of Oregon, among others). Home care workers participated in the peer-led and supportive group program for one year. Post-program results showed that COMPASS participants made large safety improvements, including hazard correction in homes and increased use of ergonomic tools. Those they care for independently confirmed the safety improvements. Home care workers also made health changes, such as improved fruit and vegetable consumption and increased good cholesterol. These are important findings because evidence-based and supportive structural programs for home care workers are extremely scarce. Future plans are focused on studying the long-term impact of COMPASS within the Oregon Home Care Commission's training system.

New Funding to Improve Sleep of Truck Driving Teams

Truck drivers experience very challenging sleep conditions due to variable work hours and noise and uncomfortable temperatures when parked at truck stops. However, truck driving teams, where one partner drives while the other sleeps, experience special additional challenges. They perform shift work (driving outside of normal day shift hours) and sleep in a bouncing/jostling vehicle. To address this problem Dr. Ryan Olson and Peter Johnson (University of Washington), proposed a project aimed at reducing driver fatigue and improving sleep and Total Worker Health. Co-investigators also include Steven



Shea and Miguel Marino (OHSU Family Medicine). This project was funded in 2016 (NIOSH) as part of the Oregon Healthy Workforce Center, and will evaluate engineering and behavioral technologies to impact fatigue, sleep and Total Worker Health. This includes an active suspension seat to reduce vibrations while driving, a mattress with a special suspension that may alter vibration profiles during sleep, and a behavioral sleep program.

Results of the SHIFT Randomized Trial

Excessive weight gain and ill health are common among truck drivers who, due to their work environment, are often

“In a randomized controlled trial funded by the National Heart Lung and Blood Institute, SHIFT produced an average difference between groups of -7.3 lb (a reduction of one full unit of Body Mass Index)” - ohsushift.com

sedentary and have poor diets. To address this, Dr. Ryan Olson developed SHIFT (Safety & Health Involvement For Truckers), a National Heart, Lung and Blood Institute (NHLBI)-funded weight loss and health promotion intervention for truck drivers. The intervention is supported by computer-based training, weekly weight and behavior logging and motivational interviewing. With the support of 5 trucking firms, a randomized controlled trial of the program was conducted with drivers (n=452) recruited from 22 terminals. Results published in 2016 showed that SHIFT produced significant and medically meaningful weight loss – over 7 lbs difference between groups. This is only the second program globally to produce a result of this size using a gold standard, randomized controlled design. This degree of weight loss is sufficient to produce an estimated \$200 in annual health care savings per person and reduce risk for developing diabetes and high blood pressure.



Olson Lab (from L to R): Layla Mansfield, Jason Malach-Fuller, Kelsey Parker, Barb Epstien, Ryan Olson, (December 2016)

Oregon Fatality Assessment and Control Evaluation (OR-FACE) Program

Globally each year about 350,000 workers are killed on the job, with nearly 5,000 deaths occurring in the US.

In 2015, **Dr. Ryan Olson** and **Illa Gilbert-Jones** led the successful award of 5 new years of funding (2015-2020) for the OR-FACE program funded by the National Institute of Occupational Safety & Health. The mission of OR-FACE is to prevent occupational fatalities through surveillance, targeted investigation, assessment, and outreach associated with traumatic work-related deaths in Oregon. OR-FACE is a special workplace safety resource for Oregon, and is one of only seven state-based programs that were funded in this new cycle. The OR-FACE project is a sub-project

of the Oregon Occupational Public Health Program, which is a partnership between the Oregon Health Authority (Curtis Cude, Co-Principal Investigator) and our Institute at Oregon Health & Science University (Ryan Olson, Co-Principal Investigator).

The OR-FACE team, L to R: Layla Mansfield, MS; Jason Malach-Fuller, BS; Barb Epstein, MPH, CIH, FAIHA; and Ryan Olson, PhD.



Dr. Diane Rohlman

Helping High-risk Populations

Occupational and environmental exposures impact all people. However, certain populations are at greater risk, including children, young workers, and those working in hazardous industries, such as immigrant workers

who may have additional risk factors. **Diane Rohlman PhD**, conducts research to identify, characterize, and prevent occupational and environmental illness and injury in these high-risk populations.

PUSH (Promoting U through Safety & Health)

This program is aimed at reducing the incidence of workplace injury among young workers using training tools specifically designed to address the needs of this population. In 2015, we created 8 new custom educational videos, designed 21 supervisor-led activities for young workers, and coordinated the development of an expanded online training curriculum with a group of national

young worker safety experts and stakeholders. Our PUSH partner, Portland Parks and Recreation Aquatics Department, continues to require the online PUSH training for all new seasonal hires.

In addition, our PUSH team completed a study funded by the Bureau of Labor and Industries Apprenticeship and Training Division and the Oregon Department of Transportation, Office of Civil Rights. The purpose of the study was to identify and characterize factors impacting construction workers' health and safety that reach beyond traditional occupational hazards. The study had two goals: 1) conduct an assessment of the health and safety needs of construction apprentices, and 2) develop and evaluate an online nutrition training program for construction apprentices.

We also worked with Portland Youth Builders (PYB), an alternative education and pre-apprenticeship program that prepares at-risk youth for careers in the building trades. We used the nutrition training developed for registered apprentices to educate over 60 students about the importance of healthy diets on work performance and success in education.



“The content in the PUSH training helps us ensure that our staff is prepared to work safely and provides information about their rights as workers and encourages them to speak up when they have questions. We also value the health promotion focus of the training, because we are aware that on the job, healthy workers are safe workers.” - Larissa Doty, Aquatics Coordinator, Portland Parks and Recreation



Dr. Leslie Hammer

Leslie Hammer, PhD, was recently recruited from Portland State University. She is Associate Director of the Oregon Healthy Workforce Center, one of six Total Worker Health™ centers of excellence funded by the National Institute for Occupational Safety and Health. She focuses on ways in which organizations can help reduce work and family stress and improve positive outcomes by facilitating both formal and informal workplace supports. For more information on Dr. Hammer's work, visit: <http://tinyurl.com/Leslie-Hammer-Supervisor-Train>

Safety & Health Improvement Program (SHIP)

Dr. Hammer recently completed the **Safety and Health Improvement Program**, which was designed to train supervisors to support balance in employee's work-family demands using a team-based approach. SHIP was tested and shown to be effective in reducing stress and improving safety among City of Portland construction workers. It is now available as a do-it-yourself Toolkit (<http://tinyurl.com/ship-prog>).



"Employees were cautious at first but now they're the ones asking supervisors if they can revisit the team effectiveness goals. They're really enthusiastic." - SHIP Program participant

SERVE (the Study of Employment Retention for Veterans)

SERVE, a Department of Defense-funded study, is designed to improve the health and well-being of Oregon veterans, service members and their families, and to increase retention of veterans and service members in the Oregon workforce. The Veteran-Supportive Supervisor Training builds on previous validated work, where supervisors in the civilian workforce were trained to better support their employed service members, and involves over 40 organizations in Oregon. Such interventions are particularly critical given the high level of veteran unemployment, and will only strengthen national programs aimed at increasing recruitment and hiring of veterans.



Leslie Hammer lab personnel, L to R, Jackie Schroeder, Wylie Wan, Janelle Cheung, Leslie Hammer, Krista Brockwood, Phoenix Rain Bird and Luke Mahoney



SERVE Team, L to R, Ryan Olson, Jason Malach-Fuller, Sarah Haverly, Krista Brockwood, Brad Wipfli, Leslie Hammer, Kent Anger, Wylie Wan, Alicia Starkey, Cynthia Mohr, Kathleen Steppe and Phoenix Rain Bird

Sleep & Shift Work

Impact on Health, Safety, and Productivity

Adequate sleep is not only essential for safety and productivity but also for our overall wellbeing and health. Our research program is designed to study basic questions about how our internal body clock works and how it affects sleep and health. The goal is to implement solutions, ranging from screening for and treating sleep disorders, educating communities about 'sleep health', to implementing interventions that improve sleep, safety, productivity and overall health in the workplace.

(<http://tinyurl.com/sleep-night-shift-work>)

Cellular Studies



Dr. Chuck Allen

Humans are rhythmic creatures living in a society that has rigid schedules for school, social activities, and work. But many people work when their endogenous circadian clock is signaling it is time to sleep, which can have adverse health effects.

Dr. Chuck Allen's research examines the neurological mechanisms responsible for biological timing and identifies possible targets for the therapeutic intervention of circadian-based disorders. To learn more, visit <http://tinyurl.com/Allen-Lab-Circadian-Neurobiolo>

neurotransmission was only partially reduced in that nerve tract (glutamate is an excitatory neurotransmitter). The vesicular glutamate transporter deletion shortens the postsynaptic current duration and decreases the probability that glutamate will be released at high stimulus frequencies, which in turn can alter the environmental light signals that are responsible for entraining the circadian clock.

Examining Circadian-Based Disorders

Dr. Allen showed that non-neuronal support cells in the brain, called astrocytes, communicate with neurons of the brain's circadian clock. This is an important finding, because astrocytes may offer an additional therapeutic target for the treatment of circadian rhythm disorders.

Activation of cannabinoid receptors in the suprachiasmatic nucleus phase-advances the circadian clock. The cannabinoid actions are mediated by non-neuronal glial cells. This study may explain why circadian disruption is observed in chronic marijuana users and provide further evidence for the important role of glial cells in the generation of circadian rhythms.

In an animal model in which the retinal ganglion cell vesicular glutamate transporter protein has been specifically eliminated, Dr. Allen found that glutamate



Charles Allen Lab (L to R): Michael Moldavan, Olga Cravetchi, Nathan Klett, Charles Allen and Lauren Hablitz (July 2016).

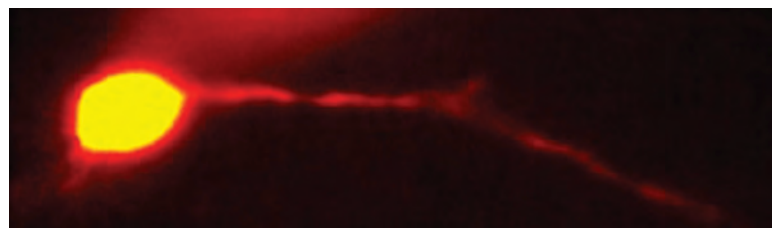
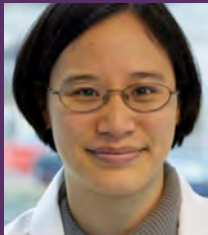


Photo of a single nerve cell from the suprachiasmatic nucleus that has been loaded with a calcium-sensitive dye. Activation of the neuron results in an increase in intracellular calcium, causing it to glow brightly.

Dr. Allen has revealed mechanisms by which cannabinoids can alter our brain's circadian clock. These findings may explain why sleep disruption is observed in chronic marijuana users.

Translational Studies



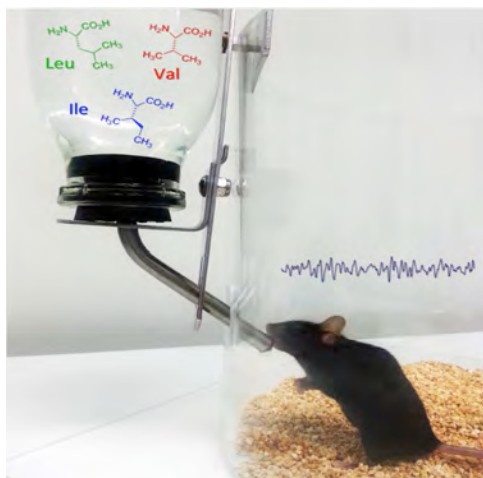
Dr. Miranda Lim

Sleep and Brain Health

Dr. Miranda Lim, affiliate Assistant Professor and Portland VA-based sleep clinician, studies the role of sleep in maintaining brain health, and is identifying neuro-markers of sleepiness and impaired performance using the brain encephalogram (EEG). Her team studies sleep in disease models including traumatic brain injury and neurodegenerative disorders in both in vivo model systems and human subjects.

Mild traumatic brain injury (mTBI) can lead to long-lasting problems with sleep, mood, and memory. The reasons for this are poorly understood, as objective testing and neuroimaging is often normal. Dr. Miranda Lim developed a rodent model of concussion, which showed persistent disturbances in the sleep encephalogram (EEG). She then studied a population of human subjects with chronic mTBI and found they also had abnormal EEGs while awake, and the degree of abnormality correlated with severity of their post-TBI symptoms. Mice with mTBI had decreased glutamate, an excitatory neurotransmitter, in wake-promoting neurons in the brain. These discoveries may lead to the development of therapies that counter EEG abnormalities and improve wakefulness after TBI.

One of Dr. Lim's laboratory study subjects drinking water supplemented with dietary amino acids to improve sleepiness after TBI



Dr. Lim continues to make breakthroughs in sleep research in Veterans with TBI and post traumatic stress disorder. In 2016, she was awarded grants from the VA Biomedical Laboratory and the VA Rehabilitation Research & Development services, the Brain and Behavior Foundation, the Collins Medical Trust, and the Oregon Medical Research Foundation. Some of the goals of these ongoing projects are to examine brain electrical activity during sleep and its ability to predict traumatic symptoms and functional outcomes at home and at work.



Lim Laboratory (L-R): Jonathan Elliott PhD, Miranda Lim MD, PhD, Carolyn Jones PhD, Ryan Opel BSc, Peyton Teutsch BSc, Jorge Rodriguez Toro, Matthew Gieger, Alex Chau, Nicholas Kuzma PhD., (July 2016)



Dr. Doris Kretzschmar

Relationship Between Alzheimer's disease and Circadian Rhythms

Disturbances of sleep and other circadian rhythms is an early sign of many neurodegenerative diseases, including Alzheimer's disease (AD). Dr. Doris Kretzschmar uses a fruit fly model of AD to study this relationship

and discovered that abnormal proteins found in AD can alter circadian rhythms. Such alterations, in turn, aggravate the neurodegeneration of AD in the fruit fly model. Dr. Kretzschmar's group is also investigating effects of circadian rhythms on the aging immune system and how this interferes with the development of AD. New discoveries in this area may lead to the development of therapies that reduce or delay the pathology of AD.

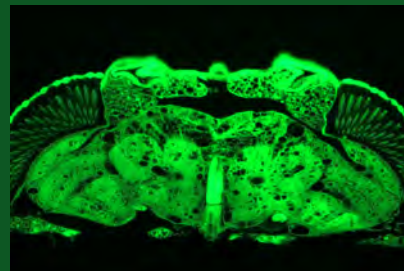


Photo of degenerated fruit fly brain

To learn more, visit:
<http://tinyurl.com/Kretzschmar-Lab-Drosophila>



Dr. Matthew Butler

The Effects of Shift Work

Shift workers have higher rates of heart disease, diabetes, and cancer that can be traced to disruptions in their internal circadian clock.

Dr. Matthew Butler's goal is to understand how our body clocks are synchronized by light and

food, and how disruption of the biological clock leads to disease. Learn more about Dr. Butler's research at: <http://tinyurl.com/Matt-Butler-Body-Clocks-Health>

People with obstructive sleep apnea are at risk for heart disease. Dr. Butler has found new measures of sleep apnea, beyond just how many episodes there are, that better predict future heart disease, especially in women. At the 2015 SLEEP meeting, he was awarded the Sleep Related Breathing Disorders Section Investigator Award for this work.

Shift workers experience weight gain that is attributable to changes in the timing of meals and the timing of endogenous biological clocks. Dr. Butler has established a laboratory in the Institute to focus on the physiology and behavior of mice on simulated shift work schedules. Ongoing studies are focused on how eating patterns synchronize internal clocks, and how shift work experience during pregnancy affects the future metabolic health of the offspring.

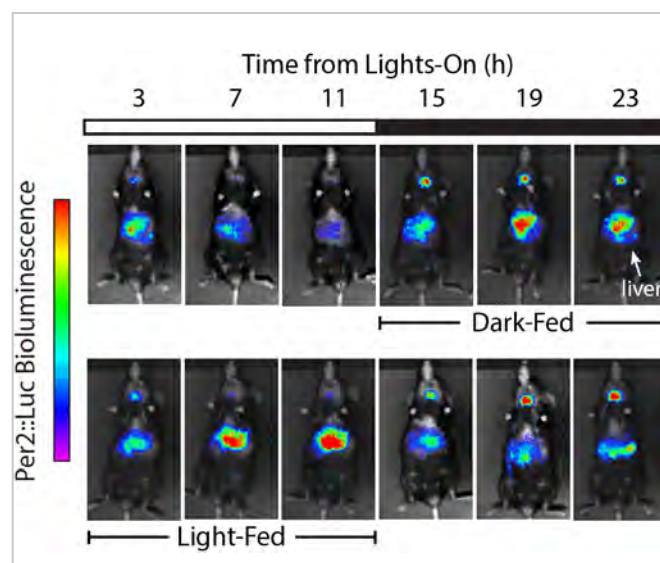
Hormones like testosterone and estrogen can affect how fast the biological clock runs, but where the hormones act to do this is not known. To determine how this occurs, Dr. Butler's team implanted tiny pellets of testosterone into the brains of mice, just next to the suprachiasmatic nucleus, where the master circadian clock is found. Testosterone in this area alone was able to change clock speed, showing that the brain clock itself is sensitive to hormones. This has implications for why men and women have different sleep schedules and perhaps why women experience more insomnia than men.

Shift workers experience weight gain that is attributable to changes in the timing of meals and the timing of endogenous biological clocks.

Dr. Butler's lab is also interested in how clocks in many different tissues of the body are synchronized to daily cues in the environment like dawn, dusk, and meal patterns. In 2016, Dr. Butler presented work at the Society for Research on Biological Rhythms, showing that the brain's clock plays an important role in setting the clock in the liver even when meals are at the wrong time. His lab has also begun a set of experiments to understand how shift work compromises fertility and reproductive success. Ultimately, this work could help mothers who engage in shift work to be healthier.



Butler Lab (L to R): Ayaka Kukino, Matt Butler, Sophia Xie, (July 2015)



Rodent sleep study showing the activation of circadian clock genes in the brain and liver under different light and dark cycles.

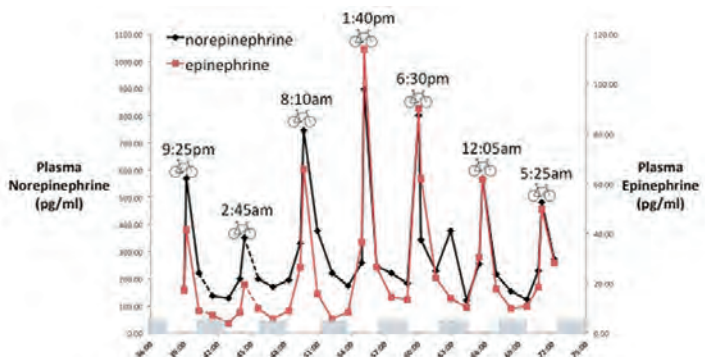
Human Studies



Dr. Steven A. Shea

Steven A. Shea's team conducts research on sleep and the internal body clock (circadian system) and how disturbances of these important functions affect human health. This is a step in efforts to develop strategies to avoid or reduce chronic diseases in populations at risk, such as night shift workers. Learn more about Dr. Shea's work at: <http://tinyurl.com/Shea-Nightshift-Health>

Dr. Shea's research is performed in specialized laboratories at the Oregon Clinical & Translational Research Institute (OCTRI) at OHSU that permit precise control of all behaviors and the environment while intensively monitoring physiological function. These studies are all performed in constant dim light and with artificial day lengths (participants do not know the actual time of day), allowing separation of circadian system effects from behavioral stresses (such as exercise). Physiological measurements include electroencephalography, vascular endothelial function, autonomic function, and collection of frequent blood, urine and saliva samples for measurement of hormone levels. Blood sampling is performed in a manner that avoids disturbing a research participant's sleep. This specialized laboratory is one of only a handful of laboratories across the world where such intensive, strictly controlled and prolonged studies can be



Sleep study showing how the catecholamine response to exercise is dramatically different in the day and night.

"All absolutely the most fabulous people I've encountered. Best faces and professionalism of OHSU. Study staff kept me entertained and distracted during the most challenging bike rides." - sleep study participant

performed in humans. An example of our research is an NIH funded study of circadian rhythms in people with obstructive sleep apnea, a condition that is associated with increased risk of cardiovascular disease. Other studies are examining the mechanisms by which the circulatory system is adversely affected by the sedentary lifestyle, and what can be done to avoid such health problems. In 2015-16 the Shea lab received extramural grants from National Space Biomedical Research Association/NASA, the Medical Research Foundation of Oregon and the National Institutes of Health. Dr. Shea also collaborates with renowned scientists across the country including at his prior institution (Harvard Medical School in Boston, MA). In 2015-16, Dr. Shea and colleagues published ten papers with important findings related to the effects of sleep, sleep apnea and the circadian system (see under publications section).



Shea Laboratory (L to R): Noal Clemons, Saurabh Thosar PhD, Steven Shea PhD, Andrew McHill PhD, Nicole Bowles, PhD, Alec Berman, Maya Herzig, Matthew Butler PhD, Gergeann Booth, Sally Roberts (Aug 2016)

"Outstanding, I really enjoyed getting to know such a dedicated, well-trained, and hardworking team." - sleep research participant



Sleep laboratory room

Exposure: Consequences and Prevention

We are using cutting edge science to characterize the adverse effects of occupational exposures, to determine the mechanisms by which these exposures produce adverse effects, and applying that information to develop specific worker training and other innovative strategies to prevent exposures and reduce adverse consequences of exposures. (<http://tinyurl.com/Exposure-Conseq-Prevent>)

Studies at the molecular level



Dr. Mitch Turker

The goal of Dr. Mitch Turker's research is to understand how environmental exposures cause gene expression to change in a stable but abnormal fashion. Such changes can contribute to diseases, such as cancer and neurodegenerative disease. Dr. Turker's work is showing that certain environmental exposures can lead to complex and tissue-specific responses with disease implications.

How Altered Day/Night Sleep Patterns Affect the Body

One environmental exposure the Turker lab is studying is how altered day/night sleep patterns affect the body. He measured the effect on mice of a weekly light/dark phase shift in which the mice lose 6 hours of the night period at each shift (mice are awake at night). In collaboration with Dr. Chuc-k Allen, they found that 8 weekly shifts significantly disrupted the liver circadian rhythm for at least one full week after the last shift was made. This finding has implications for humans who engage in non-standard work shifts.

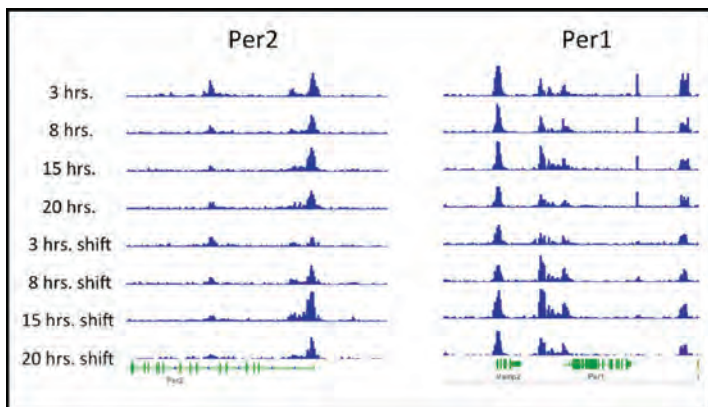
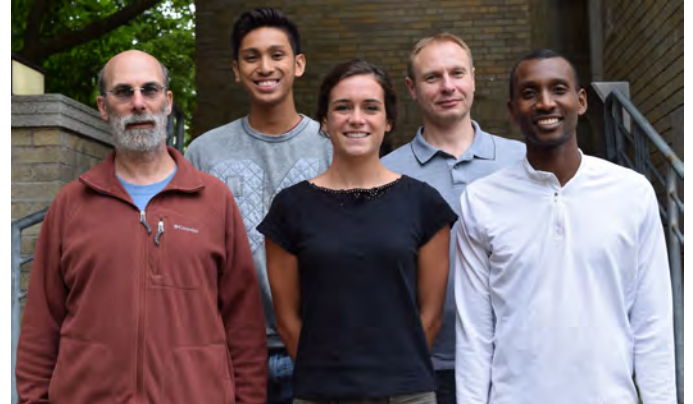


Figure from the study described above depicts the effects of 8 weekly 6 hour light/dark phase shifts on the expression of two different genes in the livers of mice.

Biological Effects of Ionizing Radiation

The Turker lab has studied the biological effects of ionizing radiation. His team found that radiation causes specific genetic mutations that may be useful as biomarkers for detecting the earliest signs of radiation-induced cancers. Turker also investigated how radiation alters the epigenome, which represents modifications to DNA that control gene expression. In collaboration with other OHSU investigators, Dr. Turker found that radiation can cause epigenome changes that correspond to changes in gene expression, and these changes are tissue-specific — the heart epigenome was found to respond to radiation quite differently than the brain epigenome. Other collaborative work has even shown changes in behavior from radiation exposure.



Turker Laboratory (L to R, Top): J.J. Terrobias, Dmytro Grygoryev, Bottom: Mitch Turker, Kathleen Daly-Jensen, Alexis Rwatambuga (August 2016)

Dr. Turker found that radiation can cause epigenome changes that correspond to changes in gene expression.... other collaborative work has even shown changes in behavior from radiation exposure.



Dr. R. Stephen Lloyd seeks to understand the fundamental DNA repair pathways that serve to protect human cells from exposures to harmful occupational and environmental chemicals and radiation. This work may ultimately allow us to

design new disease prevention and treatment strategies. We are currently developing not only prevention strategies for skin cancer that could impact workers in occupations associated with high sunlight exposures but also strategies for limiting weight gain and improved cancer screening. To learn more, visit: <http://tinyurl.com/Stephen-Lloyd-DNA-Repair>

Enhancing DNA Repair in Skin that is Exposed to Sunlight.

Oregon has one of the highest rates of skin cancer in the United States, with the most deadly form, malignant melanoma, consistently ranking in the top 5 in the country. Although this may appear to be counter-intuitive based on geographical location and frequently overcast skies, these statistics emphasize the need for Oregon workers to take appropriate measures to limit exposures and thus reduce sunlight-induced DNA damage.

However, since all skin cancer rates continue to increase annually, our research has focused on increasing the DNA repair capacity of skin. This approach which was jointly developed in Drs. McCullough and Lloyd laboratories, seeks to activate a new DNA repair system in skin cells, which quickly repairs DNA damage by introducing a DNA repair enzyme into a lotion that can be applied to the skin in a manner very similar to sunscreen. In a pre-clinical animal model of human skin, they have shown it to be safe even at doses 100-times greater than would be used on skin. Further, it rapidly repairs the major form of DNA damage and, in a rodent model, has been shown to dramatically reduce the rate of onset of skin cancers. These pre-clinical studies are designed to move toward FDA approval of a product for human use.

“I have had such an incredible experience over the past 2 years researching in the lab and presenting at science fairs. I am so grateful to have had the opportunity to work with you, and I would not be where I am today without your guidance and support” - Stuti Garg, student intern in the Lloyd lab

Mechanisms to Limit Weight Gain.

The Lloyd lab has also made significant findings in rodent models concerning how to limit weight gain, even when animals are fed a very high fat diet. The key discovery was that if the DNA repair capacity can be increased in the cellular organelle that produces energy, the mitochondria, the animals became essentially resistant to high fat diet-induced obesity. These findings provide a fundamental understanding of how comparable food intake is differentially processed among individuals.



Laboratory of Drs. Lloyd and McCullough (July, 2015): Anuradha Kumari, Vladimir Vartanian, Stuti Garg, Irina Minko, Julia Yu, Harini Sampath, Eleonora Juarez, Stephen Lloyd, Jose Esquivel, Nichole Owen, Amanda McCullough and Ingrid Lin

Genetic Risk of Chemically-induced Cancers.

Additional investigations have focused on the fundamental mechanisms by which chemical contaminants in food lead to liver and lung cancers. These contaminants come from low levels of molds in grains that then become widely distributed throughout the population. Although millions of individuals are potentially exposed, only a subset develop disease – Dr. Lloyd’s investigations shed light on the key proteins that limit cancer formation. This work may be applicable to genetic screening, which may provide a mechanism for understanding cancer susceptibility and early detection of disease.

Photomicrograph showing chromosomal damage after exposure to aflatoxins, fungal toxins found in some contaminated foods, such as peanuts. Food quality control methods prevent this in the U.S.





Dr. Amanda
McCullough

The genetic material inside cells is consistently exposed to chemicals and radiation that can damage DNA. **Dr. Amanda McCullough** uses biochemical and cellular approaches to investigate mechanisms that cells use to identify and repair damaged DNA. These DNA repair pathways are especially important

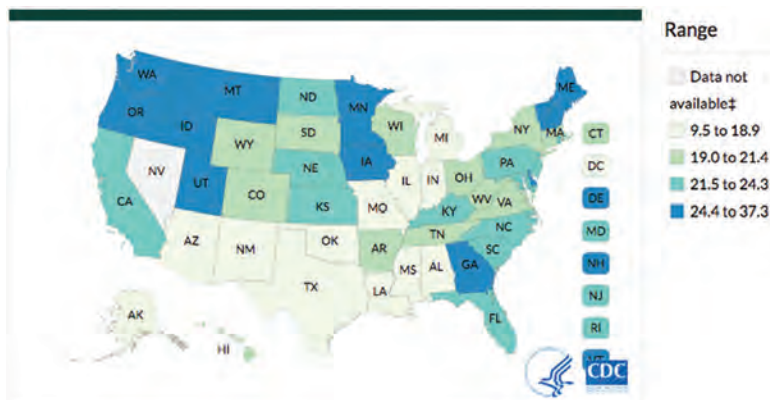
following occupational and environmental exposures (sunlight, chemicals, heavy metals, diet) and oxidative stress. Understanding these pathways can lead to the development of more effective disease prevention and treatment strategies.

Genotoxic Consequences of Formaldehyde Exposure

Formaldehyde is a human carcinogen, and there is growing concern over the possible adverse health effects from occupational and environmental human exposures. Although formaldehyde-induced DNA and protein structural changes have been identified, mechanisms that cause genomic instability and cellular tolerance to this damage are not fully characterized. The McCullough lab has previously identified unsuspected key players in the repair of formaldehyde-induced DNA damage. In 2016, these findings were extended using a human cell assay of ~400 genes to identify significant interactions among DNA damage response proteins associated with the response to formaldehyde.

Oregon has one of the highest rates of skin cancer in the United States. Sunlight induced DNA damage is a major contributing factor to the induction of skin cancers.

US Centers for Disease Control (CDC) data showing incidence rates for melanoma of the skin by state, 2013



Using DNA Repair for More Effective Cancer Treatments

An increased risk for several human cancers including breast, ovarian, colon, and skin, may arise due to an inability to repair damaged DNA. Taking advantage of these DNA repair defects by treating cancer cells with specific DNA damaging agents can increase cell killing. Defects in an oxidative stress related pathway may provide a novel target for other cancers. In 2016, the Lloyd & McCullough labs began investigating a treatment strategy that may alleviate some of the toxic effects of therapy and improve patient outcomes. Genetic analysis of acute myeloid leukemia subtypes revealed reduced levels of a critical DNA repair gene in patients carrying a specific chromosome defect. These patients are classified as having a good prognosis and the McCullough lab recently demonstrated that deficiencies in this DNA repair gene can increase cell killing by chemotherapeutics providing a potential new drug target for this complex disease.

Enhanced DNA Repair as a Skin Cancer Prevention Strategy

Oregon has one of the highest rates of skin cancer in the United States. Sunlight induced DNA damage is a major contributing factor to the initiation of skin cancers. The McCullough and Lloyd laboratories have developed a strategy to enhance DNA repair in human cells to remove the deleterious DNA damage. By introducing a new DNA repair enzyme into skin cells, the labs have demonstrated in several models of human skin that the DNA damage is rapidly removed and in 2016, pre-clinical models showed the drug dramatically reduced the rate of onset of skin cancers. These studies may lead toward FDA approval of a product for human use.



Dr. Suzanne
Mitchell

Understanding Impulsivity

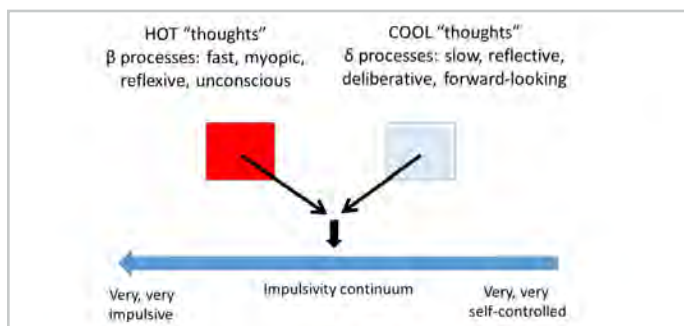
Individuals who have a history of drug and alcohol use are more impulsive than individuals who do not have such a history, and impulsivity can have workplace consequences. **Dr. Suzanne Mitchell**, Adjunct Occupational Health Sciences faculty and Behavioral

Neuroscience, School of Medicine faculty, is interested in whether this difference existed prior to drug use, or is a consequence of the neuroadaptations due to drug use.

Dr. Mitchell's lab examines the extent to which different genes are associated with impulsive behavior by comparing impulsivity in drug-naïve selected lines and inbred strains of rodents. Dr. Mitchell also examines whether different levels of impulsivity predict responses the first time rodents are exposed to drugs of abuse, like alcohol, nicotine and methamphetamine. Measures of impulsivity in human subjects are used to examine whether acute exposure to drugs of abuse or withdrawal from use results in impulsive behaviors.

Individuals who have a history of drug and alcohol use are more impulsive than individuals who do not have such a history, and such impulsivity can have workplace consequences.

While Dr. Mitchell's lab continues to publish research focused on impulsive choices, she is also developing a method that will enable investigation of how impulsivity affects the cognitive effort required to obtain a reward, for example, how willing a person is to pay attention before the mind wanders, or, trying to hold information in mind



Graphic depicting the impulsivity continuum.

that the subject is required to remember. This research may have workplace relevance in identifying those who may persist to complete tasks despite the odds or when it may not be advisable to do so.

During 2016 Dr. Mitchell received two grants to examine whether her research methods can be used to predict how long smokers interested in quitting can resist their urges to smoke.

Studying Changes in Neuropathy Target Esterase (NET)

It has been shown previously by **Dr. Doris Kretzschmar** and others that organophosphate exposure and genetic changes in a protein called Neuropathy target esterase (NTE) cause movement problems and mental retardation. This is accompanied by the degeneration of neurons, showing that the NTE protein is required for neuron survival. However, the molecular mechanisms behind this are unknown. Using a fly model, Dr. Kretzschmar found that changes in NTE produce a cellular stress response called apoptosis that causes cells to die. Because drugs that prevent this stress response are available, this discovery could lead to a treatment of NTE-related disorders.

In 2016, Dr. Kretzschmar found that NTE is also required in glia cells, which support and insulate neurons. Loss of NTE in glial cells in the fly brain causes defects in the insulation surrounding neurons and their axons and induces movement problems, even when NTE is present in neurons. Similar results were recently obtained in a rodent model. This shows that treatment strategies for NTE-related diseases not only have to be aimed at the survival of neurons but also must prevent similar effects in glia.



Kretzschmar lab, L to R, Dr. Kretzschmar, Scott Holbrooke, Elizabeth Sunderhaus and Marlène Cassar



Dr. Peter Spencer

Dr. Peter Spencer founded and directed for >20 years the Center for Research on Occupational and Environmental Toxicology (CROET), the forerunner of the Oregon Institute of Occupational Health Sciences. He now has a secondary faculty appointment with the Institute. Dr. Spencer's research focuses on the causes and mechanisms, as well as the prevention, of neurodegenerative and other neurological diseases, including those associated with perturbations of sleep and wakefulness.

In 2015, Dr. Spencer received the Edward Jenner Research Award in Neurotoxicology.

Dr. Spencer served as Faculty of Record of the OHSU interprofessional Community and Educational Exchange (iCHEE) elective (directed by Valerie Palmer, Instructor of Neurology). Three times a year, iCHEE brings interprofessional OHSU student teams together with Portland's homeless, refugees and other medically underserved in a 2-way educational activity that provides clients with a free health check and clinical referrals as necessary.

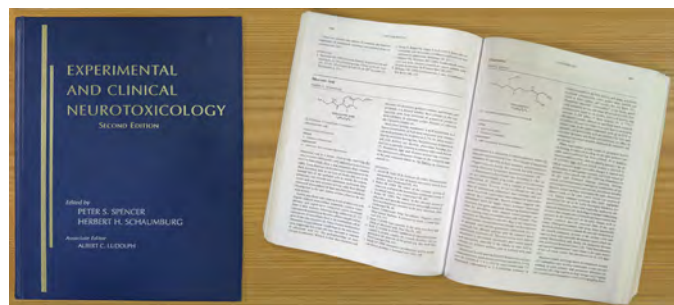
Dr. Spencer also participated in the organization and execution of a biomedical scientific conference on Nodding Syndrome in Gulu, Uganda, July 2015.

Understanding ALS-PDC

Dr. Spencer is interested in the causation and prevention of a prototypical neurodegenerative disease, the amyotrophic lateral sclerosis and parkinsonism-dementia complex (ALS-PDC), that has affected generations of minority (Chamorro) Oregonians and non-Chamorros who have lived on Guam. We have found evidence that Gulf War veterans with ALS may have acquired it from exposure to the Guam environment. The most plausible cause of ALS-PDC is the traditional Chamorro food-use of a highly neurotoxic plant that contains the potent DNA-damaging agent methylazoxymethanol (MAM). Since MAM is chemically related to nitrosamines, we have proposed research to explore possible links between occupational exposure to these substances and ALS/PDC-related neurodegenerative diseases in Oregon and worldwide.

Nodding Syndrome's Link to Measles

Dr. Peter Spencer's team is investigating the causes, consequences and prevention of Nodding Syndrome, an epidemic neurologic disorder affecting children in East Africa. We completed a case-control study that revealed a disease association with measles infection and moldy food at onset of clinical signs. We have proposed that Nodding Syndrome is a post-measles disorder comparable to subacute sclerosing panencephalitis (SSPE). While SSPE is now rare in the U.S. because of widespread measles vaccination, the disease could resurface in communities that have declined to vaccinate for measles.



Dr. Spencer is co-author of the highly acclaimed textbook "Experimental and Clinical Neurotoxicology"

[iCHEE RealLife Exhibit] "It was beautifully made..., but it was very, very saddening. All over, there were drawings and short reflections by children.... Some of them drew their experience of a tsunami..., while others spoke of being taken into a children's army in Uganda It was truly heartbreaking.... I had tears in my eyes almost the entire time." - OHSU Dental Student, Class of 2016

Injury, Treatment, Recovery, and Prevention

Physical injury is the largest contributor to workers' compensation costs in Oregon. To reduce this burden on worker wellbeing and productivity, we are conducting innovative research on the causes, treatment, recovery, and prevention of workplace injuries. (<http://tinyurl.com/Injury-Treatment-Recov-Prevent>)



Dr. Richard Deyo

Dr. Richard Deyo conducts research to identify best practices in the diagnosis and treatment of back pain and the use of opioid medications, with a major focus on reducing unsafe or unnecessary care. In recognition of his work, Dr. Deyo received the Wiltse Lifetime Achievement Award from the International Society for the Study of the Lumbar Spine. Dr. Deyo has a secondary faculty appointment with the Institute.

Improving Treatments for Back Pain

Back pain is one of the leading causes of workers' disability and compensation claims. In 2015, Dr. Deyo developed new recommendations on how best to utilize multiple clinical trial data in the synthesis of guidelines for treatment of back pain. These new recommendations should improve the quality of clinical trial research and methods for synthesizing data from multiple trials. In addition, Dr. Deyo's team has validated the use of new questionnaire tools for assessing musculoskeletal pain, and published a review on management of patients with herniated discs.

There is little evidence regarding the course of low back pain among older adults, but a better understanding of the variability in recovery may help to target patients for more intensive intervention, the planning of resource use, and the design of clinical studies. Using data from a large prospective cohort registry, Dr. Deyo's research group identified subgroups of back pain sufferers with varying trajectories of recovery, most notably small groups with major improvements in pain, function, or both. From this work, they were able to identify better predictors of clinical improvement among back pain sufferers.

Exploring Safer Opioid Prescribing Practices

Dr. Deyo has also continued analyzing the impacts of Oregon's prescription drug monitoring program (PDMP) on patterns of opioid prescribing. The hope is that PDMPs can help to inform patient

management, coordinate care, and identify drug safety risks, abuse, and diversion. These efforts should lead to safer opioid prescribing practices. However, many clinicians are not registered to use these systems and their use may be suboptimal. Dr. Deyo's team interviewed practicing clinicians to better understand how they communicate data from the PDMP with patients, and to learn how standardized clinic policies may influence use of the program. They also used PDMP data to better understand how much and for how long opioids can be prescribed by physicians before inadvertently promoting long term use.

Percent of opioid-naïve patients who became long-term users, based on prescribing in first 30 days.†

SHORT ACTING OPIOIDS			
Cumulative Morphine equivalents dispensed	n	% became long term users†	Odds Ratio*
1-119	109,983	2%	Reference
120-279	88,190	3%	1.4
280-399	18,859	5%	2.2
400-799	18,645	8%	3.0
800-1599	5,900	17%	4.6
1600-2399	1,163	28%	6.8
2400-3199	502	38%	11.3
3200-3999	185	47%	16.3

†Excludes adults >45 yo, children ≤ 11 yo, those who died within 1 yr; any address outside Oregon. Thus excludes most patients with cancer or palliative care.

†p <.0001

*adjusted for urban or rural, age

Lasting Effects of Mild Traumatic Brain Injury (mTBI)

Mild traumatic brain injury (mTBI) can lead to long-lasting problems with motor function, gait and balance. The reasons for this are poorly understood, as objective testing and neuroimaging is often normal. In addition to her studies on mTBI and sleep, Dr. Miranda Lim is collaborating with scientists at the University of Oregon to study motor function, gait and balance in Veterans with mTBI. Preliminary data indicate that even 1-5 years after injury, gait and balance disturbances persist. Moreover, measures of cortical inhibition over the motor cortex are abnormal as assessed by transcranial magnetic stimulation (TMS). These data may help lead to a better understanding of the deficits seen after brain injury.

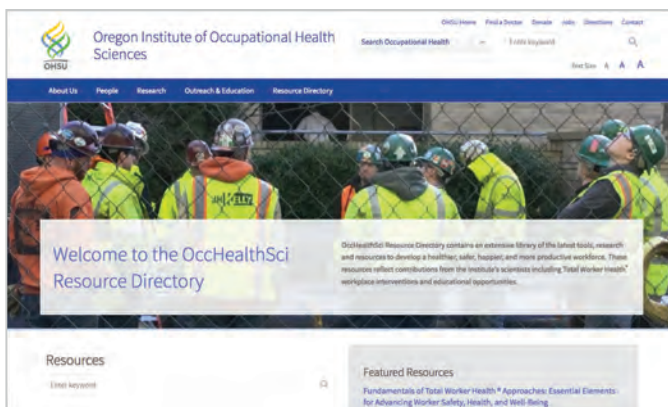
Outreach and Education

We are proactively engaged in providing timely occupational health and safety information to employees, employers, health and safety professionals, doctors, nurses, and the public.

(<http://tinyurl.com/Outreach-Education>)

The Web...

Occhealthsci.org, the Institute's widely respected health & safety resource webpage, links to over 1,200 occupational safety & health resources. In 2016 we began our transition to a new platform that will improve our ability to present information in a format more useful to the devices and computers used today.



Social Media...



We use the full range of available web technologies to provide the public with the latest in health and safety information, and continue to improve our ability to engage with LinkedIn, Twitter, Facebook, and our blog, Oregon and the Workplace, including live engagement during events.

Conferences...

Oregon OSHA-sponsored Conferences are an important means by which we reach out to working Oregonians. In addition, we are frequently asked to provide health & safety training. Members of the Institute also attend conferences sponsored by other organizations, including the American Society of Safety Engineers and the American Heart Association. Overall, conferences allow us to meet Oregonians in all corners of the state.

Continuing Education...

We provide two health, safety and wellbeing symposia per year, one sponsored jointly with the Portland State University Occupational Health Psychology program.

2015 symposia:

- Mindfulness and Total Worker Health
- Temporary and Contingent Worker Safety and Health: Best Practices, Challenges and Solutions



Mindfulness and Total Worker Health Symposium

2016 symposia:

- How to Create and Sustain a Culture of Safety (May)
- Diversity and Inclusion in the Workplace: Impact on worker health and well-being (Nov.)

The Oregon Healthy Workforce Center also sponsored the 2016 Occupational Health Psychology (OHP) Summer Institute conference "OHP Innovation and Creative Strategies Leading to Total Worker Health" (July), and the annual partner's luncheon (November).

Toxicology Information Center and Occupational Health & Safety Information Center...



Dr. Fred Berman

The Toxicology Information Center (TIC), directed by Dr. Fred Berman, and the Occupational Health and Safety Information Center, directed by Dede Montgomery, CIH, answer citizen and professional inquiries about workplace safety issues and hazards of exposure to chemicals and other agents. Dr. Berman and Ms. Montgomery handle hundreds of requests from occupational safety and health professionals, business owners,

government agencies, physicians and nurses, the media, and the general working public. The TIC is open to calls from 7:30 a.m. to 5:00 p.m., Monday through Friday.

In addition to the TIC, Dr. Berman serves as consultant to the Oregon Department of Agriculture's Pesticide Analytical and Response Center and is a co-investigator with the National Pesticide Information Center, a U.S. Environmental Protection Agency-sponsored project operated cooperatively with Oregon State University.

Ms. Montgomery also partners with a variety of organizations, including O[yes] (Oregon young employee safety), SAIIF, Oregon OSHA, the Oregon Health Authority, and American Society of Safety Engineers.

The Information Center also publishes various online and paper newsletters designed to provide up-to-date information about the Institute, as well as a series of Health Impact Safety Guides available online for use as health education tools in the workplace.



Dede Montgomery, CIH

"We (the Qorvo EHS Collaboration Team of EHS managers/engineers) met face-to-face (with Dede) in Texas this week. Wanted to let you know ... they liked the presentation and appreciated your obvious passion and knowledge ... THANK YOU for taking time with us!...PS – signed up for the Summer Institute at PSU in July."



Front and back image of one of our Health Impact Safety Guides, available for download at www.ohsu.edu/occhealthsci



Dr. Berman provides Worker Protection Standard (WPS) Train-the-Trainer instruction to Oregon agriculturalists

"Fred is very good at sticking to the science and risk facts, but at the same time handling the communication and human relations side of the issue/concern. Thanks so much for the Toxicology Information Center. Fred is the perfect person to lead the TIC."

– John Burnham, Portland Public Schools

Conferences and Events

Conferences

Blue Mountain Occupational Safety & Health Conference
June 1 & 2, 2015

Pendleton Convention Center, Pendleton, OR

American Heart Association Worksite Wellness Summit
September 1, 2015

Oregon Convention Center

Central Oregon Occupational Safety & Health Conference
September 29-30, 2015

The Riverhouse Hotel and Convention Center, Bend, OR

Oregon Public Health Association Conference
October 12-13, 2015

Oregon State University, Corvallis, OR

Southern Oregon Occupational Safety & Health Conference
October 13-15, 2015

Ashland Hills Hotels & Suites, Ashland, OR

Oregon Workers' Compensation Educational Conference
November 5-6, 2015

Salem Convention Center, Salem, OR

Western Pulp, Paper, & Forest Products Safety & Health Conference
December 1-4, 2015

December 1-4, 2015

Red Lion Hotel on the River, Jantzen Beach, Portland, OR

Mid-Oregon Construction Safety Summit
January 25-26, 2016

The Riverhouse Resort and Convention Center

Cascade Occupational Safety & Health Conference
March 8-9, 2016

Valley River Inn, Eugene Oregon



2015 GOSH Conference

L to R: Anjalie Rameshbabu, Kent Anger, Fred Berman and Dede Montgomery

American Water Works Association 2016 Annual Conference
March 14, 2016

Valley River Center, Eugene, OR

The 2015 Oregon Pesticide Symposium Presented by Oregon OSHA

March 12-13, 2015

Chemeketa Community College – Eola, Salem, OR

PNAEC Conference

May 24, 2016

Doubletree Hilton, Portland, OR

Oregon Healthy Workforce Center Occupational Health Psychology Summer Institute

July 12-14, 2016

Portland State University



2016 Fall Symposium speakers, L to R: Nichole Gilfoy, SAIF Corp.; Ian Jaquiss, OHSU; Eden King, George Mason Univ.; and Larry Martinez, Portland State Univ.

Symposia

Temporary and Contingent Worker Safety and Health: Best Practices, Challenges and Solutions

May 28, 2015

Holiday Inn Portland South, Wilsonville, Wilsonville, OR

Mindfulness and Total Worker Health

November 20, 2015

University Place Conference Center, Portland OR

How to Create and Sustain a Culture of Safety

May 20, 2016

Holiday Inn Portland South, Wilsonville, OR

Diversity and Inclusion in the Workplace: Impact on worker health and wellbeing

November 18, 2016

University Place Conference Center, Portland OR



Presentations by outreach staff

“Health effects of BtK exposures”

Asian Gypsy Moth Community Meeting,
James John Elementary School, Portland, OR

“Health effects of inhalation and ingestion of heavy metals”

Community meeting regarding environmental arsenic and
cadmium releases from local artisan glass manufacturers,
Cleveland High School, Portland, OR

“Blue-green Algae: Ya can’t live with ‘em.....ya can’t live
without ‘em”

American Water Works Association Annual Conference, Valley
River Center, Eugene, OR

“Health effects of airborne naphthalene exposure”

Community Air Toxics Meeting, The Dalles, OR

“Total Worker Health: Tips and Strategies for Safety and
Health Professionals”, Oregon Governor’s Occupational Safety
and Health Conference (GOSH), Portland OR

“Industrial Hygiene and Total Worker Health”

OHSU SE Asia Alliance, Bangkok Thailand

“On the Path to Total Worker Health”

OSHA Region 10 VPP Conference, Portland, OR

“Safety Break for Total Worker Health”

Multnomah County Safety Department, Portland OR

“Injuries and Return to Work”

Temporary Workers Symposium, Wilsonville, OR

“Total Worker Health Roundtable”

American Industrial Hygiene Continuing Education
Conference, Salt Lake City, UT

“Total Worker Health”

Northwest Association of Occupational and
Environmental Medicine, Skamania, WA

“Getting to Zero: A Total Worker Health Primer”

Central Oregon Occupational Safety & Health
Conference (with Deb Fell-Carlson, SAIF Corporation,
NIOSH TWH Affiliate), Bend, OR

“The Changing Work Environment and the Safety
Professional” (with Illa Gilbert-Jones and Mark Frisco),
ASSE Columbia-Willamette Chapter Meeting, Tualatin,
OR

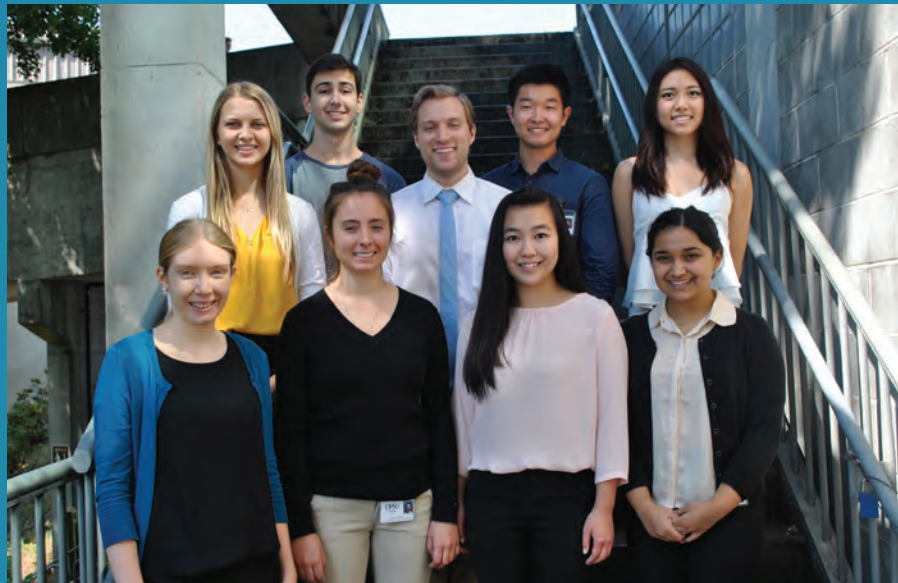
“Sleep and Total Worker Health”

Northwest Chapter - Association of Occupational Health
Professionals in Healthcare, Burien, WA

“Thanks in part to our attending OHWC symposia and GOSH sessions, we are moving down the path of making everyone...aware of the benefits of a healthy lifestyle, how it relates to a better worker and combining it with safety to get a total package –a healthy and safe worker.” - OHWC symposium attendee.

Summer Internships

Summer Student Research Awards are three-month paid summer internships designed to introduce undergraduate students to biomedical and occupational health research. In 2015 and 2016, the Oregon Institute of Occupational Health Sciences provided intensive research opportunities across a range of basic and applied research areas to a total of 25 undergraduates. Whether studying molecules, cells, organ systems, non-human organisms, or out gathering data in the community, students gained valuable experience conducting a specific project in their host faculty member's research program.



2015 Interns

Top row: Kaycee Smith, Jared Cayton, Colin Boehnlein, John Donlan, Julia Yu

Bottom row: Alison Schue, Christiana Huss, Kasey Ha, Afsara Haque

Not shown: Aaron Greenfield



2016 Interns

Top row: Austen Suits, Luke Mahoney, Julia Khoury

3rd row: Shivam Swamy, Georgeann Booth, Mubark Mebrat, Todd Carroll

2nd row: Eleanor Lagnion, Kathleen Daly-Jensen, Sadie Krahn, Vivienne Voisin

1st row: Natalie Ploof, Ali Noel Gunesch, Yvonne Barsalou, Alejandra Garfias

Faculty Presentations

Kent Anger

Development of a Total Worker Health® Intervention for Construction Workers. Pacific Northwest Apprenticeship Education Conference (PNWAEC), Portland, OR.

Development of a Total Worker Health® Program for Vineyards (poster). Western Forum for Migrant & Community Health, Portland, OR.

Effectiveness of Total Worker Health Interventions. In the National Institutes of Health Pathways to Prevention (P2P) Workshop on Total Worker Health®—What's Work Got to Do With It? Bethesda, Maryland.

Empirical Research on Integrated Health Protection and Health Promotion Interventions. In the Symposium "Integration of Health Protection and Health Promotion as Total Worker Health™: Perspectives From Across the Globe (Symposium Chair)." 31st International Congress on Occupational Health; Seoul, Korea.

Well-being as an Essential Element of Total Worker Health. In the Symposium "Work and Spirituality." 31st International Congress on Occupational Health; Seoul, Korea.

Why You Should Build a Program in Total Worker Health™ and How to Do It. NORA Symposium (Keynote); Midwest Center for Occupational Health and Safety; University of Minnesota School of Public Health; Minneapolis, MN.

Profiles of health and safety concerns for public workers from the Oregon Healthy Workforce Center. Work, Stress, and Health, Atlanta, GA.

Expanding the Impact of TWH. NIOSH Director's Meeting, Cincinnati, OH.

Matthew Butler

Apnea duration and inter-apnea interval as predictors of mortality in a prospective study. National Sleep Research Resource Early Adopters Meeting, Brigham and Women's Hospital, Boston, MA.

Hormonal regulation of circadian clock function. Biomedical Research Institute, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan.

Hormonal regulation of circadian clock function. Laboratory of Systems Pharmacology, Graduate School of Medicine, Tokyo University, Tokyo, Japan.

Awards

- Paper of the Month, OHSU School of Medicine: Butler et al. Sleep 2015.
- 2015 Winner, Sleep Related Breathing Disorders Section Investigator Award, American Academy of Sleep Medicine.
- 2015 Early Investigator Travel and Mentorship Award to Attend "Impacts of Sleep and Circadian Disruption on Energy Balance and Diabetes"; symposium organized by NIDDK and the Sleep Research Society

Richard Deyo

Beating Back Pain: can we improve quality and cut costs at the same time? Stanford University, Clinical Excellence Research Center and Division of Pain Medicine

Overutilization of Opiates: A Public Health Perspective. American Academy of Neurology Annual Meeting, Washington DC

Low Back Pain Update. Annual meeting of Oregon Chapter of the American College of Physicians, Salem, OR

The impact of new policy restriction on indications for lumbar fusion surgery. Poster Presentation at International Society for the Study of the Lumbar Spine, San Francisco

Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. Oral Presentation at International Society for the Study of the Lumbar Spine, San Francisco

Early imaging in older adults with back pain is associated with no improvement in back-related disability but increased resource utilization: an observational study. Oral Presentation at International Society for the Study of the Lumbar Spine, San Francisco

Patterns in Japan and the US: Examining our Motivations for Prescribing to Control Pain. Oral Presentation. 6th Annual Conference, Japan Primary Care Association, Tsukuba, Japan

Leslie Hammer

Presentation of phase I progress and descriptive report to the Adjutant General and his Chiefs of Staff of the Oregon Army National Guard. Oregon Military Department, Salem, OR.

Presentation to Oregon's Employer Support of the Guard and Reserve (ESGR) staff and volunteer team to discuss outreach and networking. Salem, OR.

Table Presentation and Networking at the Northwest Military Employer Summit. Camp Withycombe, Clackamas, OR.

Alcohol use and motivations among U.S. military veteran couples. Kettil Bruun Society, Munich Germany.

Risk of Occupational and Non-occupational Injury Among Employed, Post-9/11 Veterans. American Public Health Association Meeting, Chicago, IL.

Dyadic relationships between alcohol use motivations and consumption among romantic partners. Society for Social and Personality Psychology Annual Meeting, San Diego, CA.

Vulnerability and protective factors for stress-related drinking: Lessons learned from the Study for Employment Retention of Veterans (SERVe). Society for Social and Personality Psychology Annual Meeting, San Diego, CA.

Mental Health in the Workplace. American Psychological Society, Chicago, IL.

Work Organization and Psychosocial Factors of the Workplace Environment: Interventions in Terms of Psychosocial Factors. NIH Pathways to Prevention Workshop: Total Worker Health—What's Work Got to do with it? Bethesda, MD.

Interventions to Reduce Work-Life Stress and Improve Health of Workers. University of Texas at Arlington, Goolsby visiting professor. Arlington, TX.

David Hurtado

Time at work and health. Portland State University, Occupational Health Psychology, Summer Institute, Portland, OR.

Tiempo en el trabajo y salud: un abordaje desde la epidemiología social. Xaverian University, School of Economics and Business Administration, Bogota, Colombia.

Schedule Control and Health. Oregon Institute of Occupational Health Sciences, Oregon Health & Science University, Portland, OR.

Differential effects of schedule flexibility on risk of pain for office and manufacture workers. 3rd Work Family Researchers Network Conference, Washington, DC.

Characterizing scheduling demands for hourly, low-wage workers. 143rd Annual Meeting and Exposition of the American Public Health Association. Chicago, IL.

Informal work and life satisfaction in Colombia: evidence from a middle-income country. 11th International Conference on Occupational Health and Stress, Work, Stress and Health. Atlanta, GA.

Using Coworkers' reports to measure contextual workplace features: an application to flexible work arrangements and mental health. 11th International Conference on Occupational Health and Stress, Work, Stress and Health. Atlanta, GA.

A pilot assessment of the occupational health implications of scheduling control among low-wage, hourly workers. 11th International Conference on Occupational Health and Stress, Work, Stress and Health. Atlanta, GA.

Awards

- Runner-up Best Paper Award, Development and Public Health, International Journal of Public Health.

Doris Kretzschmar

Swiss-cheese, a protein involved in genetically and environmentally induced neurodegeneration, Institute of Environmental Health, OHSU, Portland, OR

Circadian clocks and Neurodegeneration, Southern Methodist University, Dallas, TX

Miranda Lim

Sleep neurophysiology in traumatic brain injury: Parallel studies in mouse and man. University of Oregon, Eugene, OR

Exploring sleep disturbances after traumatic brain injury. Washington University, Saint Louis, MO

Sleep EEG mechanisms and markers in traumatic brain injury. Washington State University, Spokane, WA

Sleep EEG markers in traumatic brain injury: Translational studies from mouse to man. American Neurological Association, Annual meeting, Chicago, IL

Glutamatergic input to orexin neurons is decreased after mild traumatic brain injury, and restored by dietary therapy. Associated Professional Sleep Societies, Annual meeting, Seattle, WA

Novel EEG-based sleep makers in the diagnosis and prognosis of TBI. Neurology Grand Rounds, Oregon Health and Science University, Portland, OR

Sleep EEG-based neuromarkers in TBI. 4th Annual Stroke Conference, Oregon Health and Science University, Portland, OR

Stephen Lloyd

The Role of GABAergic Synapses in the Generation of Circadian Rhythms. University of Michigan, Ann Arbor, MI

Amanda McCullough

DNA Repair Disorders. Dermatology Translational Talks,

DNA-protein Crosslinks and Genomic Instability. Genomic Instability Symposium

Ryan Olson

Improving the health and safety behaviors of home care workers. Paper presentation to the International Academic Research Conference, Scottsdale, AZ.

Long-term outcomes for the COMPASS intervention for home care workers in L.B. Hammer (Chair) Research Update from the Oregon Healthy Workforce Center, a NIOSH Total Worker Health™ Center of Excellence. Symposium presented at the 11th International Conferences on Occupational Stress and Health, Atlanta, GA.

Diet associations with sleep and fatigue among truck drivers: Baseline results from the SHIFT randomized controlled trial. Presentation at FASEB conference.

Behavior analysis in the workplace for productive, happy, and healthy employees. Invited presentation at the Association for Professional Behavior Analysis conference, Seattle, WA.

Preliminary findings from the SHIFT randomized controlled trial. Invited presentation to the fourth meeting of the "Panel on Research Methodologies and Statistical Approaches to Understanding Driver Fatigue Factors in Motor Carrier Safety and Driver Health," National Academy of Sciences. Keck Center of the National Academies, Washington, DC

Mobile marketing of toolbox talks to residential construction supervisors. Presentation and planning sessions with representatives of the Oregon Home Builders Association.

Lessons learned from fatal transportation incidents in Oregon. Invited presentation at the Leadership and Safety Summit of the Oregon Trucking Associations, Gleneden Beach, OR. Gilbert-Jones, I. & Olson, R. (March 2015).

Preventing serious loss injuries. Governor's Occupational Safety and Health Conference, Portland, OR.

Total Worker Health applications from the Oregon Healthy Workforce Center. Governor's Occupational Safety and Health Conference, Portland, OR.

The COMPASS program for health care workers. Governor's Occupational Safety and Health Conference, Portland, OR.

COMPASS: An effective program to prevent injuries and promote health with direct care givers. OBM Network/CalABA conference, San Diego, CA.

A Total Worker Health program for home care workers: Six month outcomes. UW/ UBC/ SFU/ Uvic/OSU Annual Conference on Environmental, Occupational, and Population Health, Semiahmoo Resort, WA.

Diane Rohlman

Building a Foundation of Health: Evaluation of a Nutrition Training for BOLI Apprentices. Bureau of Labor and Industries Quarterly Partner Meeting. Oregon City, OR.

Evaluation of Young Worker Safety Videos Using the Extended Parallel Process Model. Oregon Institute of Occupational Health Sciences Summer Intern Poster Session, Portland, OR.

Evaluating a Web-based Total Worker Health Training for Younger Workers: A Tale of Two Work Groups. Work, Stress and Health, Atlanta, GA.

Profiles of Health and Safety Concerns for Public Workers from the Oregon Healthy Workforce. Work, Stress and Health 2015, Atlanta Georgia

Total Worker Health: A new frontier in occupational safety and health research and education. University of Iowa, Hawkeye on Safety, Coralville IA

Total Worker Health® Impact on Work Comp & Medical Costs. National League of Cities Risk Information Sharing Consortium, Annapolis MD

Total Worker Health® and You: Taking Wellness to the Next Level. BJC Healthcare and Morrison Healthcare, 2nd Annual Employee Wellness Summit 2015, St. Louis MO

How Total Worker Health® Impacts More than Wellness and Safety Programs. Nebraska Safety Council, Omaha NE

Total Worker Health®: Addressing current workforce needs. University of Iowa, Business Leadership Network Steering Committee

Steven Shea

Physiologic Effects of Disturbances in Circadian Rhythm. Portland International Neuroscience Symposium, OHSU Brain Institute, Portland, OR

American Thoracic Society Core Curriculum: Overview of Circadian Biology. American Thoracic Society International Meeting, San Francisco, CA

Circadian Biology, Pulmonary Function and Sleep. American Thoracic Society International Meeting, San Francisco, CA

Physiologic Effects of Disturbances in Circadian Rhythm Psychiatry, Neurology, Neurosurgery. International Conference, Portland, OR

Cardiometabolic Vulnerabilities of Sleep Loss and Circadian Misalignment. NASA NSBRI Sleep Workshop, Houston, TX

The Internal Circadian System and Cardiovascular Health in Humans. 26th Annual Vascular Biology & Hypertension Symposium, University of Alabama, Birmingham, AL

The Peter Breyse Memorial Lecture: 24-hour Clock and Human Health. Department of Occupational & Environmental Science, University of Washington, Seattle, WA

Influence of Circadian Rhythms on Human Disease. Sleep and Performance Research Center, Washington State University, Spokane, WA

Circadian Rhythms and Human Disease. Sleep Medicine Didactic Curriculum Lecture Series Oregon Health & Science University Portland, OR

The Effects of Circadian Disruption and Sleep Disorders on Human Health. Oregon Workers' Compensation Board Educational Seminar, Wilsonville, OR

Oregon Institute of Occupational Health Sciences Annual Report. Worker's Compensation Management Labor Advisory Committee, Tigard, OR

The 24-hour Clock and Human Health. Marquam Hill Lectures, Portland, OR

The Effects of Circadian Disruption and Sleep Disorders on Human Health. Oregon Bar Association, Worker's Compensation Board, Gleneden Beach, OR

Peter Spencer

Organic Solvent Toxicity: Why and How is the Nervous System Vulnerable? International Congress on Occupational Health, Seoul, S. Korea.

Cancer prevention: plant chemical-induced DNA damage, carcinogenesis and neurodegeneration. OHSU-OSU Cancer Prevention & Control Initiative Retreat.

Nodding Syndrome: An epileptic disorder restricted to Africa? World Congress of Neurology, Santiago, Chile.

Mitch Turker

Epigenetic Changes Related To Irregular Sleep Patterns, Humanists of Greater Portland

Lecture on Radiation Epigenetics, NASA Summer School

Space Radiation, Humanists of Greater Portland, The Relation Between Mutagenesis and Genomic Instability After Particle Exposure In Vivo

2016 NASA Human Research Program, Galveston TX, **The Effect of Inappropriate Light Exposure on the Circadian Epigenome,** Environmental Mutagenesis and Genomic Society Annual Meeting, Kansas City, MO

Faculty Publications

Total Worker Health

- Anger WK, Elliot DL, Bodner T, Olson R, Rohlman DS, Truxillo DM, Kuehl KS, Hammer LB, Montgomery D. **Effectiveness of total worker health interventions.** J Occup Health Psychol 2015; 20(2): 226-47
- Barbosa C, Bray JW, Dowd WN, Mills MJ, Moen P, Wipfli B, Olson R, Kelly EL. **Return on Investment of a Work-Family Intervention: Evidence From the Work, Family, and Health Network.** J Occup Environ Med 2015; 57(9): 943-51
- Berkman LB, Liu SY, Hammer LB, Moen P, Klein LC, Kelly E, Fay M, Davis K, Durham M, Karuntzos G, Buxton OM. **Work/family demands, cardiometabolic risk and sleep duration in extended care employees.** J Occup Health Psychol 2015; 20: 4 20-433
- Buxton OM, Lee S, Beverly C, Berkman LF, Moen P, Kelly EL, Hammer LB & Almeida DM. **Work-family conflict and employee sleep: Evidence from IT workers in the work, family and health study.** Sleep. 2016; 39(10): 1871-1882
- Davis KD, Lawson K, Almeida DM, Kelly E, King RB, Hammer LB, Casper L, Okechukwu C, Hanson G and McHale SM. **Parents' daily time with their children: A workplace intervention.** Pediatrics 2015; 135(5): 875-882
- DePasquale N, Polenick C, Davis KD, Moen P, Hammer LB and Almeida DM. **The psychosocial implications of managing work and family caregiving roles: Gender differences among IT professionals.** J Fam Issue. 2015: 1-25
- DePasquale N, Davis KD, Zarit SH, Moen P, Hammer LB & Almeida DM. **Combining formal and informal caregiving roles: The psychosocial implications of double- and triple-duty care.** J Gerontology - Series B Psych Sci and Soc Sci. 2016; 71(2): 201-211
- Glass N, Hanson GC, Laharnar N, Anger WK & Perrin N. **Interactive training improves workplace climate, knowledge, and support towards domestic violence.** Am J Indust Med. 2016; 59(7): 538-548
- Hammer L, Truxillo D, Bodner T, Rineer J, Pytlovany A and Richman A. **Effects of a workplace intervention targeting psychosocial risk factors on safety and health outcomes: Psychosocial factors and workers health and safety.** BioMed Res Intern. 2015; 2015
- Hammer LB, Johnson RC, Crain TL, Bodner T, Kossek EE, Davis KD, Kelly EL, Buxton OM, Karuntzos G, Chosewood L & Berkman L. **Intervention effects on safety compliance and citizenship behaviors: Evidence from the work, family, and health study.** J Applied Psych. 2016; 101(2): 190-208
- Hurtado DA, Nelson CC, Hashimoto D, Sorensen G. **Supervisors' support for nurses' meal breaks and mental health.** Workplace Health Safety 2015; 63(3): 107-15
- Hurtado DA, Okechukwu CA, Buxton OM, Hammer L, Hanson GC, Moen P, Klein LC & Berkman LF. **Effects on cigarette consumption of a work-family supportive organisational intervention: 6-month results from the work, family and health network study.** J Epi and Comm Health. 2016; 70:1155-1161
- Hurtado DA, Berkman LF, Buxton OM, Okechukwu CA. **Schedule Control and Nursing Home Quality: Exploratory Evidence of a Psychosocial Predictor of Resident Care.** J Appl Gerontol 2016; 35(2): 244-53
- Hurtado DA, Hessel P, Avendano M. **The hidden costs of informal work: lack of social protection and subjective well-being in Colombia.** Int J Public Health. 2016 Aug 29: 1-10
- Jackson CL, Wee CC, Hurtado DA, Kawachi I. **Obesity trends by industry of employment in the United States, 2004 to 2011.** BMC Obesity 2016; 3: 20
- Korabik K, Rhijn TV, Ayman R, Lero DS & Hammer LB. **Gender, polychronicity, and the work-family interface: is a preference for multitasking beneficial? Community, Work and Family.** 2016; 20(3): 307-326
- Kossek EE, Piszczek MM, McAlpine KL, Hammer LB & Burke L. **Filling the holes: Work schedulers as job crafters of employment practice in longterm health care.** Aug 1 2016 In: Indust and Labor Relations Rev. 2016; 69(4): 961-990
- Lam J, Fox K, Fan W, Moen P, Kelly EL, Hammer L, Kossek E. **Manager Characteristics and Employee Job Insecurity around a Merger Announcement: The Role of Status and Crossover.** The Sociological Quarterly 2015; 56(3): 558-580
- Mitchell SH, Wilson VB and Karalunas SL. **Comparing hyperbolic, delay-amount sensitivity and present-bias models of delay discounting.** Behavioral Processes 2015; 114: 52-62.
- Moen P, Kaduk A, Kossek E, Hammer L, Buxton OM, O'Donnell E, Almeida D, Fox K, Tranby E, Oakes JM, Casper L. **Is work-family conflict a multi-level stressor linking job conditions to mental health? Evidence from the Work Family and Health Network.** Research in the Sociology of Work: Work & Family in the New Economy 2015; 26: 177-217
- Odle-Dusseau HN, Hammer LB, Crain TL & Bodner TE. **The influence of family-supportive supervisor training on employee job performance and attitudes: An organizational work-family intervention.** J Occ Health Psych. 2016; 21(3): 296-308
- Okechukwu CA, Bacic J, Velasquez E & Hammer LB. **Marginal structural modelling of associations of occupational injuries with voluntary and involuntary job loss among nursing home workers.** Occ and Env Med 2016; 73(3): 175-182
- Okechukwu CA, Kelly EL, Bacic J, DePasquale N, Hurtado D, Kossek E, Sembajwe G. **Supporting employees' work-family needs improves health care quality: Longitudinal evidence from long-term care.** Soc Sci Med 2016; 157:111-9
- Olson R, Wipfli B, Thompson SV, Elliot DL, Anger WK, Bodner T, Hammer LB & Perrin NA. **Weight control intervention for truck drivers: The SHIFT Randomized controlled trial, United States.** Am J Pub Health. 2016 Sep; 106(9): 1698-1706
- Olson R, Crain TL, Bodner T, King R, Hammer L, Klein LC, Erickson L, Moen P, Berkman L and Buxton OM. **A workplace intervention improves actigraphic sleep duration in a randomized, controlled study: Results from the Work, Family, and Health Network.** Sleep Health 2015; 1: 55-65

Olson R, Wright RR, Elliot DL, Hess JA, Thompson S, Buckmaster A, Luther K, Wipfli B. **The COMPASS pilot study: a total worker Health™ intervention for home care workers.** J Occup Environ Med 2015; 57(4): 406-16

Olson R, Thompson SV, Wipfli B, Hanson G, Elliot DL, Anger WK, Bodner T, Hammer LB, Hohn E & Perrin NA. **Sleep, dietary, and exercise behavioral clusters among truck drivers with obesity.** J Occ & Env Med. 2016; 58(3): 314-321

Olson R, Varga A, Cannon A, Jones J, Gilbert-Jones I & Zoller E. **Toolbox talks to prevent construction fatalities: Empirical development and evaluation.** Safety Science. 2016; 86: 122-131

Olson R, Thompson SV, Elliot DL, Hess JA, Rhoten KL, Parker KN, Wright RR, Wipfli B, Bettencourt KM, Buckmaster A & Marino M. **Safety and health support for home care workers: The COMPASS randomized controlled trial.** Am J Pub Health. 2016; 106(10): 1823-1832

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Truxillo DM, Cadiz DE and Hammer LB. **Supporting the aging workforce: A review and recommendations for workplace intervention research.** Ann Rev Org Psych and Org Behav 2015; 2: 351-81

Yragui NL, Demsky CA, Hammer LB, van Dyck S & Neradilek MB. **Linking Workplace Aggression to Employee Well-Being and Work: The Moderating Role of Family-Supportive Supervisor Behaviors (FSSB).** J Business and Psychology. 2016; Mar: 1-18

Sleep and Shiftwork: Impact on Health, Safety and Productivity

Allen CN, Nitabach MN, and Colwell CS. **Membrane currents, gene expression, and circadian clocks.** Cold Spring Harbor Perspect Biol, 2016 doi: 10.1101/cshperspect.a027714

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Gurubhagavatula I, Patil S, Meoli A, Olson R, Sullivan S, Berneking M & Watson NF. **Sleep apnea evaluation of commercial motor vehicle operators.** J Clin Sleep Med. 2016; 12(3): 285-286

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- Costa Dias TG, Iyer SP, Carpenter SD, Cary RP, Wilson VB, Mitchell SH, Nigg JT, Fair DA. **Characterizing heterogeneity in children with and without ADHD based on reward system connectivity.** *Devel Cog Neurosci* 2015; 11: 155-174
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Injury, Treatment, Recovery and Prevention

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Grants 2014–2015

Principal Investigator/ Grant Title	Funding Source
Allen, Charles	
Calcium Signaling in Suprachiasmatic Nucleus Neurons	NIH Nat'l Inst of General Medical Science
Cellular Electrophysiology of the Suprachiasmatic Nuclei	NIH Nat'l Inst of Neuro Disorders & Stroke
Anger, W. Kent	
Partnership to Improve Workplace Safety for In-Home Care Workers	Nat'l Inst for Occupational Safety & Health via Johns Hopkins University
Evaluation of the Oregon Protective Leave Law for Victims of Violence	Nat'l Inst for Occupational Safety & Health via Johns Hopkins University
Oregon Healthy Workforce Center	National Institute for Occupational Safety & Health
Pacific Northwest Agricultural Safety and Health Center	Nat'l Inst for Occupational Safety & Health via University of Washington
Berman, Fred	
The National Pesticide Information Center at Oregon State University	U.S. EPA via Oregon State University
Butler, Matthew	
Lights, food, and mis-timed clocks	Medical Research Foundation of Oregon
Sex differences in sleep apnea and novel sleep measures to predict cardiovascular risk	American Sleep Medicine Foundation
Cassar, Marlene	
Investigate loss-of and gain-of functions of human Tau modifications in Drosophila	OHSU Foundation
Hammer, Leslie	
Portland Center: Work Life Network Phase II	NIH Nat'l Inst of Child Hlth & Human Dvlp via Portland State Univ.
Oregon Healthy Workforce Center	National Institute for Occupational Safety & Health
Development and Evaluation of Veteran Supportive Supervisor Training (VSST): Improving Reintegration of the Oregon National Guard and Reserves in the Workplace	U.S. Army Medical Rsch Acquisition Activity
Kretzschmar, Doris	
SWS/NTE function in neurodegeneration and axonopathy	NIH National Institute of Neurological Disorders & Stroke
Circadian Clocks and Aging	NIH National Institute on Aging via Oregon State University
Investigate the connection between circadian clock, chronic neuroinflammation, and neuronal damage in the Drosophila model	Medical Research Foundation of Oregon
Creating new Drosophila models to study Tau loss and gain-off functions	NIH National Institute of Neurological Disorders & Stroke
Lloyd, R. Stephen	
Cellular responses to DNA-protein crosslinks	NIH National Cancer Institute
Enhancement of DNA Repair Capacity Following UW Irradiation	Restoration Genetics
Novel Targets in Cancer Chemotherapy: Chemical Biology of Guanine Alkylation	NIH National Cancer Institute via Vanderbilt University
DNA Adduct-Induced Mutagenesis	NIH National Cancer Institute via Vanderbilt University
Small Molecule Inhibitors of DNA Repair Enzymes for Enhancement of Chemotherapeutic Efficacy	Oregon Translational Research and Drug Development
Mccullough, Amanda	
Cellular responses to DNA-protein crosslinks	NIH National Cancer Institute
Enhancement of DNA Repair Capacity Following UW Irradiation	Restoration Genetics
Montgomery, Dede	
Oregon Healthy Workforce Center	National Institute for Occupational Safety & Health
Olson, Ryan	
Portland Center: Work Life Network Phase II	NIH Nat'l Inst of Child Hlth & Human Dvlp via Portland State Univ.
Social Support During a Randomized Trial of a Trucker Weight Loss Intervention	NIH National Heart, Lung, and Blood Institute
Oregon Healthy Workforce Center	National Institute for Occupational Safety & Health
Improving Occupational Health in Oregon: Turning Data to Action	Nat'l Inst for Occupational Safety & Health via Oregon Health Authority
Effects of an anti-vibration truck cab mattress on team truck drivers' sleep, health, and performance	State of Washington Dept of Labor & Industries via University of Washington
Rohlman, Diane	
Oregon Healthy WorkLife Center	National Institute for Occupational Safety & Health
Online Training Modules for Highway Construction Apprentices	State of Oregon Bureau of Labor & Industries
Sampath, Harini	
Role of Oxidative DNA Damage in the Onset and Progression of Metabolic Syndrome	NIH National Institute of Diabetes & Digestive & Kidney Diseases
Shannon, Jackie	
Comparative Mechanism of Cancer Chemoprevention	NIH Nat'l Cancer Inst via University of Texas, Health Science Center at Houston
Shea, Steven/Thosar, Saurabh	
Chronobiology of cardiovascular and pulmonary disease	NIH National Heart, Lung, and Blood Institute
Circadian Rhythms and Cardiovascular Risk	NIH National Heart, Lung, and Blood Institute
Circadian disruption, physical inactivity and cardiovascular risk	Medical Research Foundation of Oregon
Sleep, Physical Inactivity, Circadian Rhythms and Cardiovascular Vulnerability	NSBRI/NASA
Tshala-Katumbay - Desire	
Toxicodietary and Genetic Determinants of Susceptibility to Neurodegeneration	NIH National Institute of Environmental Health Sciences
Onchocerciasis-Associated Neurodevelopmental Deficits: The Hit Squad	NIH Fogerty International Center
Turker, Mitchell	
Comparative Analysis of Charged Particle-Induced Autosomal Mutagenesis in Murine Tissue and Cells	NASA via University of California, Berkeley
Ground-Based Studies in Space Radiobiology	National Aeronautics and Space Administration (NASA)
Rapid Screening Assay for Novel Epigenetic Drugs	NIH Nat'l Inst of Envir Hlth via Nzumbe Inc
A screening assay for chemicals that affect the differentiation of human neural cells	NIH Nat'l Inst of Envir Hlth via Nzumbe Inc

Grants 2015–2016

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Allen, Charles	
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Pacific Northwest Agricultural Safety and Health Center	Nat'l Inst for Occupational Safety & Health via University of Washington
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Cassar, Marlene	
Investigate loss-of and gain-of functions of human Tau modifications in Drosophila	OHSU-Layton Center for Aging and Alzheimer Research
Hammer, Leslie	
Oregon Healthy Workforce Center	National Institute for Occupational Safety & Health
Development and Evaluation of Veteran Supportive Supervisor Training (VSST): Improving Reintegration of the Oregon National Guard and Reserves in the Workplace	U.S. Army Medical Rsch Acquisition Activity
Evaluation of a Work-Family and Sleep Leadership Intervention in the Oregon National Guard: A Behavioral Health Leadership Approach.	U.S. Army Medical Rsch Acquisition Activity
Kretzschmar, Doris	
SWS/NTE function in neurodegeneration and axonopathy	NIH National Institute of Neurological Disorders & Stroke
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Chronobiology of cardiovascular and pulmonary disease	NIH National Heart, Lung, and Blood Institute
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Circadian disruption, physical inactivity and cardiovascular risk	Medical Research Foundation of Oregon
Sleep, Physical Inactivity, Circadian Rhythms and Cardiovascular Vulnerability	NSBRI/NASA
Turker, Mitchell	
Comparative Analysis of Charged Particle-Induced Autosomal Mutagenesis in Murine Tissue and Cells	NASA via University of California, Berkeley
Ground-Based Studies in Space Radiobiology	National Aeronautics and Space Administration (NASA)
A screening assay for chemicals that affect the differentiation of human neural cells	NIH Nat'l Inst of Envir Hlth via Nzumbe Inc

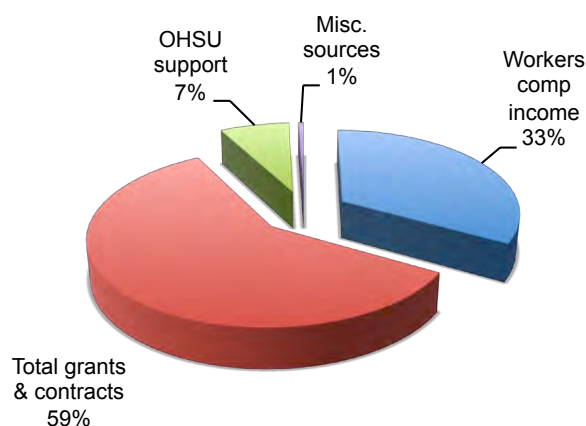
Oregon Institute of Occupational Health Sciences Income and Expenditures

July 1, 2014 to June 30, 2015

Income

Workers compensation income	\$	3,401,928
Total grants & contracts	\$	6,032,412
OHSU support	\$	743,996
Misc. sources	\$	55,577
	\$	10,233,913

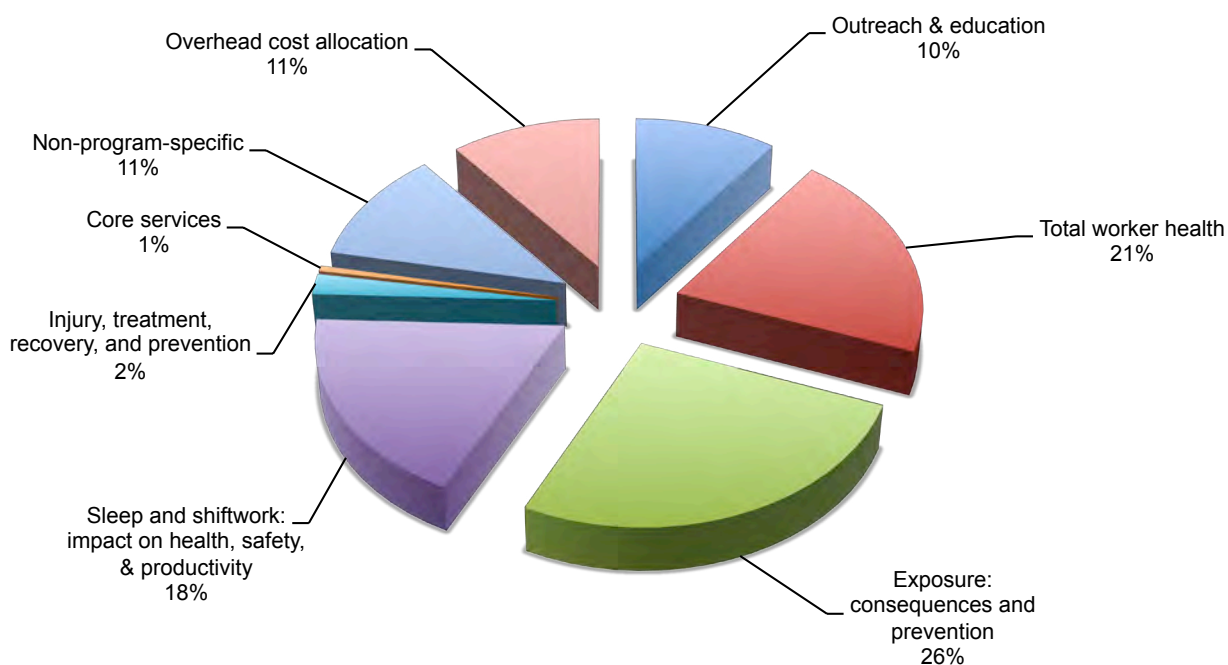
Income by Source



Expenses

All salaries & fringe benefits	\$	5,705,062
Services & supplies	\$	2,611,949
Bond principal & interest	\$	353,481
OHSU overhead cost allocation	\$	1,042,821
	\$	9,713,313

Expenses by Program



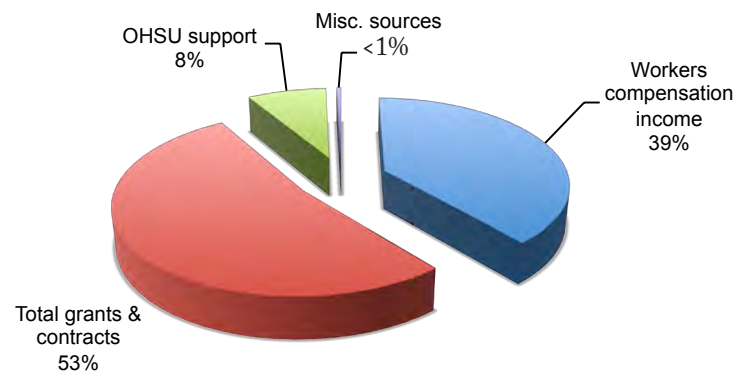
Oregon Institute of Occupational Health Sciences Income and Expenditures

July 1, 2015 to June 30, 2016

Income

Workers compensation income	\$	3,563,543
Total grants & contracts	\$	4,810,445
OHSU support	\$	745,147
Misc. sources	\$	42,696
	\$	9,161,831

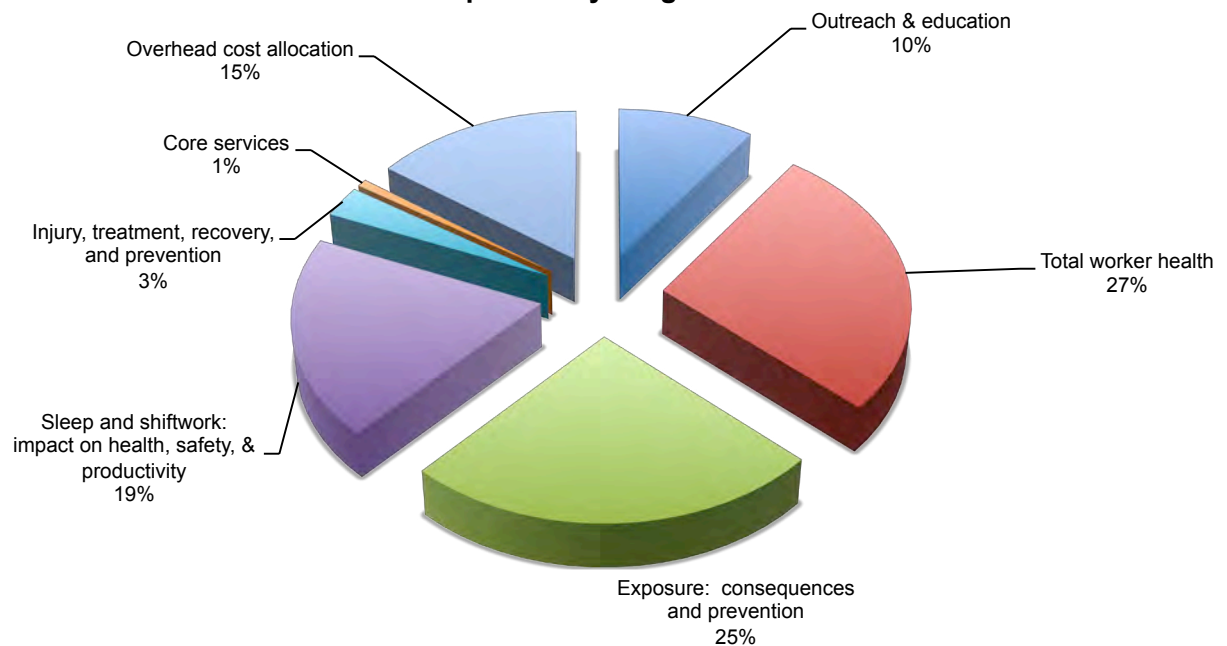
Income by Source



Expenses

All salaries & fringe benefits	\$4,653,260.26
Services & supplies	\$ 2,014,750
Bond principal & interest	\$ 353,481
OHSU overhead cost allocation	\$ 1,017,663
	\$ 8,039,155

Expenses by Program



Oregon Institute of Occupational Health Sciences

The Oregon Institute of Occupational Health Sciences conducts research, provides consultation, and offers the public information on hazardous chemicals and their health effects. The Institute includes scientists and research staff exploring a range of questions relating to prevention of injury and disease, and promotion of health, in the workforce of Oregon and beyond. The Toxicology Information Center (TIC) answers Oregonians' questions about chemical and other occupational exposures, and the Institute's resource web page, Occhealthsci.org makes health and safety information available 24 hours a day.

How to Contact Us

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For additional copies of this report, call the Institute at the numbers listed.

Institute Personnel 2015–16

(Hire-retire dates in parentheses)

Director and Senior Scientist

Steven A. Shea, PhD (2012-)

Associate Director of Applied Research and Professor

W. Kent Anger, PhD (1989-)

Associate Director of Basic Research and Professor

R. Stephen Lloyd, PhD (2003-)

Associate Director of Administration

Janice Stewart, BS (1988-)

Faculty

Charles Allen, PhD (1990-)

W. Kent Anger, PhD (1989-)

Matthew Butler, PhD (2013-)

Leslie Hammer, PhD (2015-)

David Hurtado, ScD, ScM (2015-)

Doris Kretzschmar, PhD (2002-)

R. Stephen Lloyd, PhD (2003-)

Amanda McCullough, PhD (2003-)

Ryan Olson, PhD (2005-)

Diane Rohlman, PhD (1992-2016)

Harini Sampath, PhD (2009-2016)

Steven A. Shea, PhD (2012-)

Mitchell Turker, PhD, JD (1996-)

Brad Wipfli, PhD (2008-2016)

Affiliated/Secondary Faculty

Richard Deyo, MD, MPH (2009-)

Miranda Lim, MD, PhD (2014-)

Suzanne Mitchell, PhD (2016-)

Peter S. Spencer, PhD, FRCPATH (1987-)

Scientific Staff

Lindsey Alley, MS (2015-2016)

Daniel Austin, MS (1989-)

Frederick Berman, DVM, PhD (2001-)

Krista Brockwood, PhD (2015-)

Marlene Cassar, PhD (2013-)

Janelle Cheung, PhD (2016-)

Olga Cravetchi, MS (2011-)

Illa Gilbert Jones, MS, CIH, CSP
(2013-2016)

Sam Greenspan, MPH, BA (2016-)

Dmytro Grygoryev, PhD (2009-)

Frankie Guros, PhD (2016-)

Lauren Hablitz, PhD (2015-)

Anuradha Kumari, PhD (2007-2016)

Jason Kyler-Yano, MS (2015-)

Mike Lasarev, MS (1996-)

Rachel Matsumoto, MS (2016-)

Irina Minko, PhD (2003-)

Michael Moldavan, PhD (2001-)

Dede Montgomery, MS, CIH (2004-)

Miki Morioto, MD (2014-)

Nichole Owen, PhD (2015-)

Megan Parish, MPH (2011-2016)

Kelsey Parker, PhD (2015-)

Anjali Rameshbabu, PhD (2015-)

Sharon Thompson, MS, RD, PhD
(2011-2015)

Saurabh Thosar, PhD (2014-)

Vladimir Vartanian, PhD (2003-)

Wylie Wan, PhD (2015-)

FRONT COVER

Photo montage depicting people and scenes from the Oregon Institute of Occupational Health Sciences.

Oregon Institute of Occupational Health Sciences

3181 SW Sam Jackson Park Rd., L606
Portland, OR 97239-3098

Oregon Health & Science University includes the Schools of Dentistry, Medicine and Nursing; OHSU Hospital; numerous primary care and specialty clinics; multiple research institutes and several outreach and public service units. OHSU is an equal opportunity, affirmative action institution.

