



## Seattle Institute for Biomedical and Clinical Research

July - September 2019

### Spotlight Feature

#### JEFFREY ILLFF, PHD



Everyone knows that they should probably get more sleep. But do the consequences of poor sleep extend beyond feeling tired the next day? Sleep worsens with age, and is frequently disrupted after concussion (mild traumatic brain injury, mTBI). But is worsening sleep part of the reason that the aging and post-traumatic brain are vulnerable to the development of neurodegenerative conditions like Alzheimer's or Parkinson's disease? These are the questions that Dr. Jeffrey Illff, who joined the VA Puget Sound in June 2019 as Associate Director for Research in the VISN 20 Mental Illness Research, Education and Clinical Center (MIRECC), is trying to answer.

Dr. Illff completed his undergrad at the University of Washington and PhD in Physiology and Pharmacology at Oregon Health & Science University (OHSU). As a postdoc at the University of Rochester Medical Center, Dr. Illff and his mentor, Dr. Maiken Nedergaard, published a series of pioneering studies defining the brain's 'glymphatic system', which

supports the movement of fluid through brain tissue during sleep to clear away neurotoxic wastes that accumulate throughout the day. A TED talk that Dr. Illff delivered on the subject can be viewed at:

[https://www.ted.com/talks/jeff\\_illff\\_one\\_more\\_reason\\_to\\_get\\_a\\_good\\_night\\_s\\_sleep](https://www.ted.com/talks/jeff_illff_one_more_reason_to_get_a_good_night_s_sleep)

Dr. Illff holds the Arthur J. and Marcella McCaffray Endowed Professorship in Alzheimer's Disease, and is a Professor of Psychiatry and Behavioral Sciences and of Neurology at the University of Washington School of Medicine. Prior to his recruitment to the VA Puget Sound, Dr. Illff served as the Vice Chair for Basic Science Research in the Department of Anesthesiology and Perioperative Medicine at OHSU.

During his time at OHSU, Dr. Illff developed a strongly collaborative research program spanning basic science research to define the cellular mechanisms underlying glymphatic pathway impairment in the aging and post-traumatic rodent brain; to human transcriptomic, histopathological and genetic studies to evaluate the relevance of these changes to human disease; to human neuroimaging studies to develop non-invasive MRI-based approaches to measuring glymphatic pathway function across the waking and sleeping human brain. His group demonstrated that glymphatic clearance of proteins involved in neurodegenerative diseases like Alzheimer's and Parkinson's is impaired in the brain as it ages and after TBI. This impairment stems in part from changes in how astrocytes, the brain's support cells, handle water transport. These findings may provide an explanation for the complex clinical relationship between TBI, aging, sleep disruption and neurodegenerative diseases, and may provide a novel therapeutic target for the treatment and prevention of many neurodegenerative diseases.

In making this move, Dr. Illff looks forward to the opportunity to join a rich, collaborative environment focusing on TBI and neurodegenerative disease research at the VA Puget Sound and University of Washington's Alzheimer's Disease Research Center.

#### ANNUAL REPORT

SIBCR released its [2018 Annual Report](#), which captures the highlights of a busy and successful year. Thank you to our members, staff, sponsors and supporters for your dedication in helping to improve the health and well-being of Veterans!

#### UPCOMING R&D SEMINARS

William DePaolo, PhD, Associate Professor of Medicine and the Lynn M. and Michael G. Garvey Endowed Chair, UW Department of Medicine/Division of Gastroenterology, "Hacking the Human Microbiome," July 16, 2019, Building 1, Room 240 from Noon – 1:00 PM