THE UNIVERSITY OF IDAHO
NEUROPHYSIOLOGICAL IMAGING AND MODELING LABORATORY

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PhD Student Position – Research Assistant (RA)
Focus: Computational Fluid Dynamics of Intrathecal Drug Delivery to the Central Nervous System

The Neurophysiological Imaging and Modeling Laboratory (NIML) within the Department of Biological Engineering at the University of Idaho is dedicated to advancing the health and well-being of millions of people affected by central nervous system (CNS) diseases and disorders including: Chiari malformation, syringomyelia, hydrocephalus, amyotrophic lateral sclerosis (ALS), Friedreich's Ataxia, glioblastoma and others. The NIML seeks highly motivated and critical-thinking students who wish to participate in a dynamic multi-disciplinary research team that makes new discoveries about CNS disorders using state-of-the-art medical imaging and modeling techniques.

Project Supervisor
Dr. Bryn Martin, Assistant Professor, Department of Biological Engineering

The PhD Committee
Your doctoral studies will be supervised by a panel of experts from within the University of Idaho Department of Biological Engineering, Mechanical Engineering, Neuroscience and industrial contacts. They will evaluate your progress and provide you with constant support and supervision. The candidate's degree will be granted in Biological Engineering.

Position
A PhD student position is offered from August 10th, 2015 with $21,000 salary (tuition and fees waived).

Deadline for submission
Accepting applicants until position is filled.

Project description
Intrathecal drug and gene vector delivery allows direct pharmaceutical targeting of the CNS that can help minimize side effects associated with conventional oral and intravenous based pharmacotherapies and allows delivery of larger molecule sizes to the CNS that are otherwise unable to cross the blood-brain-barrier. The delivery of therapeutic agents to the CNS tissue is dependent on pulsation-dependent mixing of the spinal CSF (CSF dynamics). However, CSF dynamics around the brain and spinal cord is little understood. Our goal is to develop and validate a computational fluid dynamics (CFD) tool that will help understand and optimize intrathecal therapy delivery systems and protocols.

The project will be conducted in collaboration with an industry sponsor that is a leader in gene vector drug delivery to the CNS. The successful applicant will benefit from interaction with both academic and industrial supervisors. This is a unique opportunity to apply and validate CFD methods to a rapidly advancing field of research and receive excellent training in clinical-translational research that includes innovative MR imaging protocols collected in vivo.

Qualifications
Applicants should hold a B.S. or M.S (preferred) in Biomedical, Biological, Mechanical or Chemical Engineering or related engineering discipline and have extensive experience in CFD modeling techniques and software (ANSYS FLUENT or open source solver Open-FOAM or others). Experience

with moving boundary methods with non-uniform mesh motion is helpful. Expertise in fluid mechanics and advection and diffusion modeling is preferred. Some background in MR image post-processing methods is also helpful. Excellent English communication skills (written and oral) and ability to work in a team is expected. Applicants should be enthusiastic to conduct innovative research.

The University of Idaho
The University of Idaho (UI) is a top-choice for students and aspiring leaders from around the globe and is ranked by U.S. News & World Report as 85th in the nations public universities. UI annual research expenditure in 2011 was nearly 100 million dollars. The National Institutes of Health awarded UI $10.6M in 2015 to support creation of the Center for Modeling Complex Interactions and has also created the Integrated Research and Innovation Center for interdisciplinary research across a broad spectrum of science and engineering. UI boasts several unique research resources including the NSF funded big-STEM supercomputer with 8TB of RAM, the Bioinformatics and Computational Biology core, Genomics resources core among many others. It is located in Moscow, Idaho surrounded by the idyllic rolling Palouse hills. Moscow has 24,000 residents and was selected as one of the nations five best places to live among college towns with art galleries, coffee shops, pubs and outdoor activities.

Submission of the application
To apply, please send a cover letter with a short personal statement outlining your research and technical background, CV, copies of your degree transcripts and references to: brynm@uidaho.edu

Applications of disabled persons with the same professional and personal qualification will be treated preferentially. Please indicate a handicap in the cover letter and enclose the relevant certificate.

UI promotes equal opportunities. Applications of female candidates are expressly encouraged and will be treated preferably in case of equal qualifications and suitability.

Further information
For further information, please email Dr. Bryn Martin, brynm@uidaho.edu.