TWO POSTDOCTORAL RESEARCH SCIENTIST POSITIONS IN AUTOPHAGY

Vierstra Lab: Department of Biology
Washington University in St. Louis, USA

Full Description: Two Postdoctoral Research Scientist positions are available immediately to study autophagy and its roles in growth and development, nutrient recycling, and maintenance of protein homeostasis. It is now becoming clear that autophagy is a major player in the selective turnover of individual proteins, protein complexes, protein aggregates, organelles and even invading pathogens. Using yeast, Arabidopsis and maize as tractable genetic and biochemical models, the Vierstra lab is attempting to define the mechanisms that drive selective autophagy and understand how this process influences an organism’s proteome during development and under nutrient-rich and starvation conditions, using a suite of omics approaches including mass spectrometric methods to globally interrogate changes in the proteome of an organism.

The goal of the NIH-funded project is to understand selective autophagy using a novel collection of autophagy receptors we recently discovered that employ an ATG8-binding UIM domain to tether substrates to enveloping autophagic vesicles. Two important targets of these UIM receptors are proteasomes and CDC48/p97, that become substrates for autophagy upon chemical inhibition or genetic inactivation. Turnover of proteasomes (proteaphagy) is of particular interest as its degradation is regulated by a series of ubiquitylation events and involves at least two types of biomolecular condensates before deposition of proteasomes into vacuoles/lysosomes for degradation. As the CDC48/p97 mutants that initiate autophagy have been linked to a variety of neuropathogies, understanding this turnover has medical relevance. The second project recently funded by NSF-PGRP involves exploiting metabolomic, proteomic, transcriptome and ionomic analyses on a collection of maize atg mutants impacting various steps in autophagy to understand how this system regulates intracellular recycling and helps maintain proteostasis. Central to this work is an in-house ThermoFischer Q-Exactive mass spectrometer that enables deep proteomic analyses at a quantitative level to provide overviews of how proteomes are affected and adjust to defects in autophagy.


Washington University in St. Louis is a center of excellence in all aspects of biology with a special emphasis on plant science, and includes modern facilities and instrumentation necessary for the proposed work. In addition, the Washington University Medical School, the Danforth Plant Science Center and companies such as Bayer Crop Sciences are nearby, making St. Louis an attractive place to do research with an abundance of technical expertise available. St. Louis is a diverse community which boasts an attractive living environment with numerous cultural, sporting and recreational activities close by.

Requirements: Ph.D in biochemistry, genetics, molecular biology, or related areas. Experiences with mass spectrometry and a broad background in biochemistry and genetics are helpful. A competitive salary (commensurate with experience), fringe benefits including health insurance, and travel support to meetings are available. Funding is for at least 2 years with additional years possible. Washington University in St. Louis is an Equal Opportunity/Affirmative Action Employer.

Application Instructions: Email (rdvierstra@wustl.edu) or send your resume, copies of relevant publications, a cover letter detailing research experience, and a list of three scientists (preferably faculty) that can provide letters of recommendation to:

Dr. Richard D. Vierstra
George and Charmaine Mallinckrodt Professor
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Questions about this position and our recent progress can be addressed via email (rdvierstra@wustl.edu) or by phone (608-469-6569, cell). Applications will be accepted until suitable candidates are hired.