



John Jack, Ph.D.

Computational Analysis and Modeling, Louisiana Tech University
Postdoctoral Fellow, EPA's National Center for Computational Toxicology

As a postdoctoral researcher in the NCCT, I have opportunities to collaborate with a diverse group of talented scientists. I enjoy using these collaborations to fuel my research into the molecular pathways underlying hepatotoxicity. I am grateful for the outstanding mentorship available at the NCCT coupled with the chance to pursue environmentally inspired problems in systems biology.

Virtual Liver Project

The U.S. EPA Virtual Liver Project (v-Liver™) is aimed at producing an innovative computational system for estimating the effects of environmental contaminants in the human liver. Current approaches for assessing the risk of chemical-induced liver toxicity are based on results of animal testing, which are difficult to extrapolate to humans. To address this challenge we are developing "Virtual Tissues" -- a multidisciplinary approach that integrates data from in vitro experiments into in silico microanatomic models of tissues. The v-Liver™ is a proof-of-concept model of the hepatic lobule, the anatomic unit of the liver. Our goal is to use molecular and cellular in vitro data from ToxCast™ and public domain information to elucidate and simulate the key processes involved in Nuclear Receptor (NR)-mediated liver cancer. In the long-term, v-Liver™ will reduce dependence on animal testing through predictive tools for estimating the risk of chronic liver injury in humans.