

BILBAO

SPAIN

Christopher Long

Bio



Christopher Long is the Director of Engineering and Automation at Hesperos, Inc., a growth-stage start up focusing on microphysiological systems (MPS devices), in vitro-based devices recapitulating physiological conditions for disease modeling, drug discovery, and personalized medicine. Dr. Long earned his Ph.D. in Materials Science and Engineering from the University of Florida, and has been developing MPS devices since 2010. As a member of Hesperos since the company first spun out of the University of Central Florida in 2015, Dr. Long has overseen the engineering development, pharmacokinetic-pharmacodynamic modeling, and integration of Hesperos' Human-on-a-Chip® MPS platform, which focuses on measuring functional changes in organ constructs in multi-organ devices with a

common recirculating medium. Multi-organ Human-on-a-Chip systems enable interactions among the different organ modules, which are especially important when effects due to compound metabolism, disease-related mutations, or soluble factor production are not previously well established. Dr. Long developed pharmacokinetic modeling algorithms for application to specialized multi-organ microfluidic devices for predicting time-dependent drug and metabolite concentrations. The models are not only informative, but also drive the development of the structure of the microfluidic network to optimize concentration profiles.

Abstract

Hesperos created and developed the Human-on-a-Chip® platform of microphysiological systems (MPS), in vitro-based devices recapitulating physiological conditions for disease modeling, drug discovery, and personalized medicine. The Human-on-a-Chip platform focuses on measuring functional changes in organ constructs in multi-organ devices with a common recirculating medium, enabling interactions among the different organ modules, which are especially important when effects due to compound metabolism, disease-related mutations, or soluble factor production are not previously well established. A Human-on-a-Chip system containing two barrier tissues, the gastrointestinal tract and blood brain barrier, was developed for modeling of oral and intravenous administration of drug compounds with associated changes in central nervous system function. Pharmacokinetic modeling of the transport of three drugs through the system based on experimental data established the baseline model for use with PKPD modeling. This system was expanded to include a liver construct for hepatic metabolism and an active network of cortical neurons in the CNS module for evaluating echinacea extract and one of the primary active components, dodeca-2e 4e 8z 10e/z-tetraenoic-acid-isobutylamide, on amelioration of stress-induced deficits in long term potentiation.

