

# Organs-on-Chips for Drug Safety Testing

Wyss Institute



Today the Wyss Institute for Biologically Inspired Engineering at Harvard University and AstraZeneca announced a collaboration that will leverage the Institute's Organs-on-Chips technologies to better predict safety of drugs in humans.

Human Organs-on-Chips are composed of a clear, flexible polymer about the size of a computer memory stick, and contain hollow microfluidic channels lined by living human cells -- allowing researchers to recreate the physiological and mechanical functions of the organ, and to observe what happens in real time. The goal is to provide more predictive and useful measures of the efficacy and safety of potential new drugs in humans -- which could represent an important step in reducing the need for traditional animal testing.

The collaboration with AstraZeneca will apply the Institute's advances in the development and validation of human Organs-on-Chips to develop new animal versions. These animal organs-on-chips will be tested alongside the human models to further understand the extent to which drug safety results in animals can predict how an investigational drug might impact humans. The testing of a potential new

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medicine on animals is a small but necessary step in bringing this medicine to market. Regulators require safety data from animal studies before giving the required approval to test a new medicine in humans. However, animal tests do not always accurately predict what will happen in humans.

"Comparing human and animal Organs-on-Chips is an exciting example of what we call 'predictive science,' in which we harness the power of technology to better understand how a medicine might ultimately impact patients and in some cases speed the delivery of innovative new medicines," said Stefan Platz, Vice President Drug Safety and Metabolism at AstraZeneca. "The Wyss Institute's technology could play a critical role in both improving patient safety and reducing the need for animal testing."

In February, Wyss Founding Director Don Ingber, M.D., Ph.D., who leads the Organs-on-Chips research program, received the prestigious 3Rs Prize from the UK's National Centre for the Replacement, Refinement and Reduction of Animals in Research for the lung-on-a-chip. In March the Society of Toxicology awarded him the Leading Edge in Basic Science Award for his "seminal scientific contributions and advances to understanding fundamental mechanisms of toxicity."

"This collaboration with AstraZeneca will help us to validate this approach as a potential alternative to animal testing by carrying out direct comparisons between organ chips containing cells from animals versus humans in organ-mimicking environments," said Ingber. "If successful, this effort should lead to ways to streamline the drug development process and more effectively predict safety of drugs and chemicals in humans."

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