Draper to Build Preclinical Microphysiological Systems with Pfizer to Help Predict Clinical Outcomes

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Draper applies human organ systems expertise to combine best aspects of in vitro and in vivo testing

CAMBRIDGE, MA – Draper today announces a three-year agreement with Pfizer Inc. (NYSE: PFE) under which the companies will collaborate to create unique versions of Draper's Microphysiological Systems (MPS) technology with the aim of improving preclinical safety testing and creating more effective disease models.

Draper's MPS technology, more commonly described as "organs-on-a-chip technology," aims to recapitulate human tissues, allowing researchers to measure tissue function more accurately and more quickly than in traditional preclinical models. In collaboration with Pfizer, Draper is building three unique MPS models for liver, vascular and gastrointestinal organs.

The goal of the MPS technology is to create an improved way for pharmaceutical companies to test potential new drug candidates by yielding more accurate results faster and with less expense than current processes. The technology combines the control, precision and ability to scale to a higher throughput system with the complexity and organ-specific functionality of human tissues, and can be easily integrated into existing lab automation and screening tools.

According to Nature Biology, 90 percent of drugs fail in human clinical trials despite successfully completing animal (in vivo) and lab (in vitro) tests. Such tests fail to replicate

the precise cellular conditions of humans, and the results may be misleading.

“We’re engineering an environment that encourages cells to function in vitro as they would in specific human organs in vivo,” explained Joseph Charest, who directs the MPS technology development in Draper’s Biomedical Solutions program office. “We believe that the real value proposition of Draper’s technology is that, in addition to creating the optimal environment for cell function, our sensing technology measures the function of the cells directly and in real-time while our format ensures the system will scale to high levels of throughput.”

“If we’re successful, this technology may enable new patient therapies that are safer and more precisely tailored to a disease, a population or a specific patient,” added Tara Clark, Draper, Vice President of Commercial Solutions. “We hope to demonstrate that MPS technology has the potential to reduce risks and costs, and improve translation into the clinic.”

“We believe that utilizing Draper’s MPS technology has the potential to help us overcome one of the challenges of drug discovery, which is translation from in vitro to in vivo and from preclinical to clinical,” said John Burkhardt, Vice President, Drug Safety Research & Development, Pfizer. “Finding a more efficient way to bridge the translation gap would enable us to humanize the drug discovery process and reduce dependence on other two-dimensional models, and ultimately to more quickly bring new medicines to patients who need them.”

Draper’s MPS technology was developed by Draper’s Biomedical Solutions business, which is comprised of three areas: Human Organ Systems, Rapid Diagnostics and Precision Medicine.

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