HUMANOID SENSOR CONSORTIUM

MISSION

The mission of the Consortium is to revolutionize drug development and personalized medicine by using the "Body-on-a-Chip" system to:

- **Improve drug effectiveness and safety**
- **Reduce time, costs and risk**
- **Accelerate personalized medicine**

The consortium pools stakeholder talents, resources and ideas to address industry-wide challenges in developing new drugs and predicting responses of drugs, as well as personalized medicine applications and clinical trial design.

This revolutionary approach can enable the selection of optimal personalized drug treatment regimens to improve patient outcomes with improved efficacy and reduced adverse events.

AIMS

1. **Drug candidate screening**: Build a library of existing and new compounds and determine their effect on human tissues and organs. The integrated data sets will use AI/machine learning capabilities to optimize predictive toxicity and efficacy models for new drug candidates.

2. **Disease models:** Create specific disease models – for example, organoids with fibrosis or infection to study drug efficacy.

3. **Personalized medicine platform:** Drive a new standard of care by creating organoids with the potential to test treatments before subjecting the patient to the therapy.

The RegenMed Development Organization (ReMDO) is leading the creation of a new consortium that will include pharmaceutical leaders, toxicity specialists, animal researchers, regulators and funding agencies:

"So data can be shared, and we can all push the field forward, together."

To learn more contact info@remdo.org

ReMDO
Advancing Regenerative Medicine Technologies

The **Humanoid Sensor Consortium** will utilize the Wake Forest Institute for Regenerative Medicine's (WFIRM) "Body-on-a-Chip" system. This system allows scientists to engineer an advanced 3D model of the human body using a system of chips and microfluidic devices, creating a structure in which to place the humanoid tissue equivalents. These tissue equivalents function in a very similar manner as actual human organs. For example, the heart beats about 60 times each minute, the lung breathes the air from the surrounding environment, and the liver breaks down toxic compounds into harmless waste products.

The system, depending on how many tissues it uses, can be designed to fit an area about the size of a deck of cards.

As part of this research, the WFIRM team tested the system by using it to screen approved drugs that had been recalled off the market by the Food and Drug Administration. Although initially the manufacturers tested these drugs in cell culture, animals and human clinical trials, no toxicity was noted until the drugs were used widely in humans, when it was discovered that these drugs could actually be harmful to people. The WFIRM "Body-on-a-Chip" system was able to readily detect toxicity and mirror human physiology, replicating the damage seen in patients at bedside.

MEMBER BENEFITS

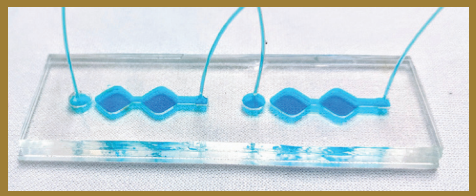
1. Body-on-a-Chip system using bioprinted miniature human organs with microchip and biosensing technologies for drug discovery

2. State-of-the-art robotics and 3D bioprinting for multi-organ system for automation of high throughput drug screening

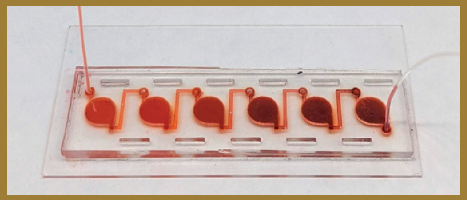
3. Drug library and integrated data sets using AI/machine learning capabilities to optimize predictive toxicity and efficacy models for new drug candidates

4. Digital medicine database with patient derived data for predictive preventative medicine, prognosis and therapeutics

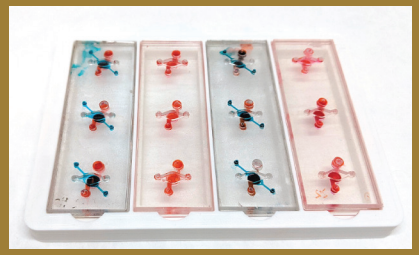
Organ Tissue Equivalent Progression



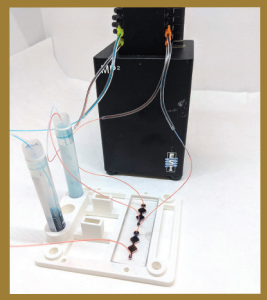
Two organ tissue equivalents (2)



Six organ tissue equivalent
(L to R: endothelium, liver, lung, cardiac, brain, testes/ovary)



Parallel system with reservoirs for media delivery, collection and recirculation



System Interfacing with advanced biosensing/biomonitoring hardware