

Organ on a Chip

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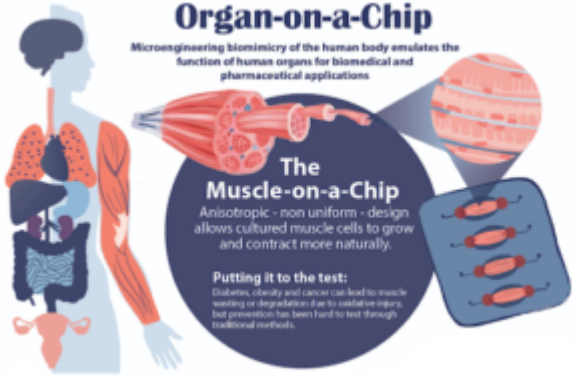
In news– The U.S. Food and Drug Administration Modernization Act 2.0 has recently approved computer-based and experimental alternatives to animals to test new drugs.

What is Organ on a Chip?

- An organ-on-a-chip is a **multi-channel 3-D microfluidic cell culture, integrated circuit that simulates the activities**, mechanics and physiological response of an entire organ or an organ system.
- **It is a small devices containing human cells that are used to mimic the environment in human organs**, including blood flow and breathing movements, serving as synthetic environments in which to test new drugs.
- This technology **allows researchers to replicate the function of tissues and organs, bridging the gap between animals and human systems.**
- In drug development, it's seen as an exciting in vitro alternative to assess not only the safety but efficacy of drugs.
- **In India, a few research groups have been developing organ-on-chip models over the last few years.**
- Scientists at the Institute of Chemical Technology, Mumbai have developed a **skin-on-chip model**. he model is currently being tested for studying skin irritation and toxicity.
- They are also developing **a retina-on-chip model** together. They are also separately developing a placenta-on-chip model.

Organ-on-a-Chip

Microengineering biomimicry of the human body emulates the function of human organs for biomedical and pharmaceutical applications



The Muscle-on-a-Chip

Anisotropic - non uniform - design allows cultured muscle cells to grow and contract more naturally.

Putting it to the test:

Diabetes, obesity and cancer can lead to muscle wasting or degeneration due to oxidative injury, but prevention has been hard to test through traditional methods.