MICROPHYSIOLOGICAL SYSTEMS (MPS)

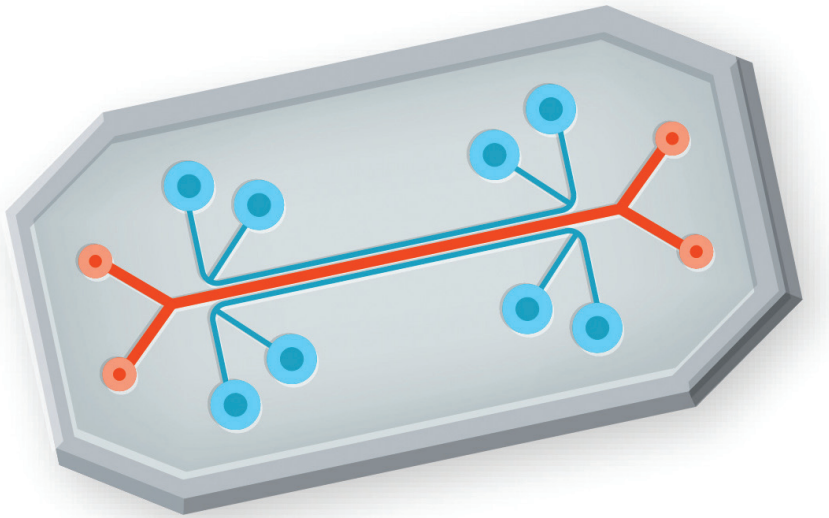
Microphysiological systems (MPS), also called organs-on-chips, are microfluidic devices that emulate tissue and organ physiology *in vitro*. MPS allow for the application of fluid flow and the combination of several organ systems.

ATTRIBUTES

- A system that allows for the three-dimensional co-culture of multiple cell types
- Independently controlled parameters (e.g. types, ratios, and configurations of cells; transcellular chemical, molecular, and oxygen gradients; flow levels; and mechanical forces)
- Biochemical and biomechanical microenvironments that influence cell activities
- Tissue-tissue interfaces which recapitulate tissue-barrier functions and transcellular transport, absorption, and secretion
- High-resolution imaging capability in real time

APPLICATIONS

- Discovering mechanisms of human disease and pathways of toxicity
- Identifying human responses to drugs, toxins, and environmental cues
- Testing drugs and chemicals under physiological conditions
- Modelling pharmacokinetic and pharmacodynamic properties of drugs
- Investigating toxicokinetic parameters of chemicals
- Studying the interplay of several organ systems in multi-organ MPS/human-on-a-chip



SELECT PUBLICATIONS

Bahinski *et al.* The promise and potential of "organs-on-chips" as preclinical models. *Appl In Vitro Toxicol.* 2015;1(4):235-242.

Marx *et al.* Biology-Inspired Microphysiological Systems to Advance Patient Benefit and Animal Welfare in Drug Development. *ALTEX.* 2020;37(3):365-394.

Low *et al.* Organs-on-chips: into the next decade. *Nat Rev Drug Discov.* 2020.

INDUSTRY PLAYERS

• 4DCell • AlveoliX • AxoSim • BiomimX • BEOnChip • Cherry Biotech • Cellasys • CN Bio Innovations • Emulate • Hesperos • HμREL® Corporation • IONTOX* • IVTech* • Kirkstall* • MesoBioTech • Micronit • Mimetas • Nortis • Novoheart • OSPIN • SynVivo • TARA • Tissue Dynamics • TissUse

*Offers a system which is scaled to a slightly larger size than microfluidic systems

MPS NETWORKS

• EurOoC • Organ-on-a-Chip Technologies Network • hDMT • IQMPS

+49 (0) 711-860-591-0
Info@thepsci.eu • ThePSCI.eu

PETA SCIENCE CONSORTIUM INTERNATIONAL e.V.