

Multi-organ on a chip for PK model-based drug screening

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Due to the difficulty of directly testing animal or human subjects, cell-based in vitro model systems are widely used in pharmaceutical industry. However, currently available in vitro systems are far from a faithful reproduction of an organism. For example, the effect of a xenobiotic compounds is tested in vitro by incubating a monolayer of cells in the presence of the drug, but in human body, the drug goes through a dynamic process of metabolism and excretion, which result in complex whole-body response. Combination of microscale technology, mathematical modeling, and biomaterials can contribute to developing an in vitro system that mimics the human body better. Here, we introduce microfluidic organ-on-a-chip devices for mimicking the functions of various organs, including the gut, liver and the skin. We also demonstrate recapitulation of organ-organ interaction using such systems. Organ-on-a-chip devices can be useful platforms for drug screening and disease modeling.