A Working Group Supporting Adoption of MPS in Infectious Disease Research

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As animals and humans share some anatomical and physiological similarities, animal studies have contributed to a foundational understanding of the biological processes involved in disease. However, usefulness of animal models in understanding human health is limited, partly due to inherent species differences. Scientific and technological advances that attempt to address these limitations include the development of in vitro platforms called microphysiological systems (MPS). Thus, human cell-based MPS have demonstrated their potential to unravel mechanisms of human physiology and disease by recapitulating human organs and organ systems in a dish.

The emergence and global spread of COVID-19 presented an opportunity for assessing the utility of MPS to study how SARS-CoV-2 affects the lungs and other organs and to support development of therapeutics. However, these rapid and widespread endeavors also increased the risk of overlapping investigations and duplication of research efforts. The MPS for COVID Research (MPSCoRe) working group was organized to globally connect key MPS stakeholders to reduce this risk. The working group facilitates open communication among stakeholders to maximize the impact of MPS technologies in understanding disease mechanisms and treatments and reducing animal use while improving human health. In this way, the group aims to promote adoption of MPS for studying COVID-19 and future emerging infectious diseases. These efforts will accelerate the development and adoption of MPS in infectious disease research and may reduce the reliance on animal models in future studies. Project was funded by NIEHS under Contract No. HHSN273201500010C.