

Advanced manufacturing and novel materials for biomicrofluidic and organ-on-a-chip systems (*New - Winter 2019*)

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Organ-on-a-chip (OOC) systems are microfabricated devices that combine living cells, biomaterials, and other biological elements together with microscale feature geometries and microfluidics to mimic the structure, function, and physiology of real tissues and organs. OOCs are quickly emerging as a powerful technology with significant advantages over traditional experimental models. To date, however, the majority of OOCs have been fabricated from only a few popular materials such as PDMS and thermoplastics. The objective of this project is to investigate and review advanced manufacturing and novel materials that can be used to develop next-generation organ-on-a-chip systems. The ideal material will have properties that include optical transparency, cell compatibility, scalability (for mass manufacturing), and amenability to achieving high spatial resolutions.

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Research Area: Microfluidics; biofluid mechanics; microscale cell-based systems; cellular microenvironments; microfabrication; cell biology; cell imaging and microscopy; biomedical engineering; and cancer.