



Research Week 2020

Bone-on-a-chip - A biomimetic organ-on-a-chip model system to study cancer metastasis

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Keywords

Microfluidics, bone, organ-on-a-chip

Abstract

Bone tissue is a common site of metastasis, affecting a large number of patients with advanced cancer. The specificity of bone for extravasation of many types of cancers appears to be tightly related to the specific chemo-attractant molecules secreted by bone stromal cells, as well as possible interactions with other non-cancer cells, such as platelets, leukocytes, and monocytes/macrophages. Current bone models of metastasis do not replicate the real complexity of the native bone tissue. However, recent efforts in our lab have shown a rapid fabrication method for the engineering of vascularized bone models that mimic the key hallmarks of the bone cellular and extracellular microenvironment. In this study, we combined our rapid bone fabrication method with microfluidic systems to create an organ-on-a-chip system that can mimic the nanoscale mineralization of the native bone tissue and aspects that are relevant to cancer metastasis.