

Biomanufacturing Vascularized Human Tissues via Organoid Building Blocks

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Biomanufacturing human tissues and organs that recapitulate the cellular and architectural complexity of native organs is a grand challenge. We posit that multicellular matrices, spheroids, and organoids are requisite biological building blocks for achieving this goal. I will begin by highlighting our ability to transform human induced pluripotent stem cells (hiPSCs) into vascularized kidney organoids via scalable differentiation protocols. Next, I will describe our recent work on printing human kidney tissues with embedded vasculature via sacrificial writing in functional tissue (SWIFT). Finally, I will introduce our efforts to implant such tissues in small animal models, in collaboration with Dr. Leo Riella and his team (MGH).