

SAKAI LAB.

[Tissue Engineering for Regenerative Medicine and Cell-Based Assay

Centre for International Research on Integrative Biomedical Systems

<http://envchem.iis.u-tokyo.ac.jp/sakai/index.php>

Department of
Chemical System Engineering
BioEngineering

Organs and Biosystems Engineering

Reconstruction and Utilization of Tissues

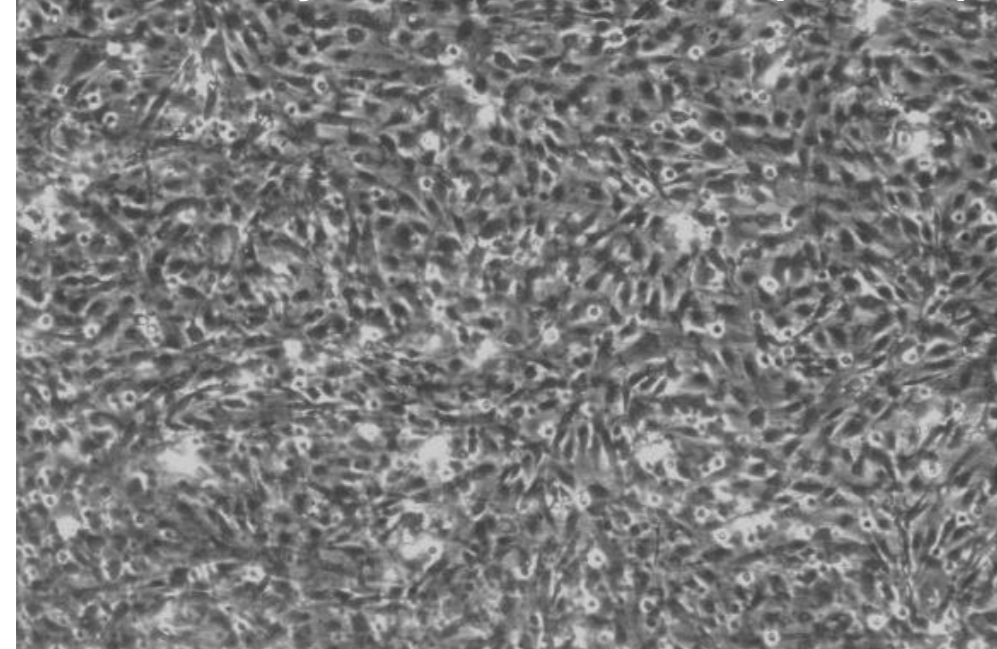
Toward applications to regenerative medicine for transplantation treatment and cell-based assays for drug and chemical screening, we have studied mass production and differentiation control of progenitor stem cells, construction of implantable tissues, and development of cell-based assays.

Mass Production and Differentiation Control of Progenitor Stem cells

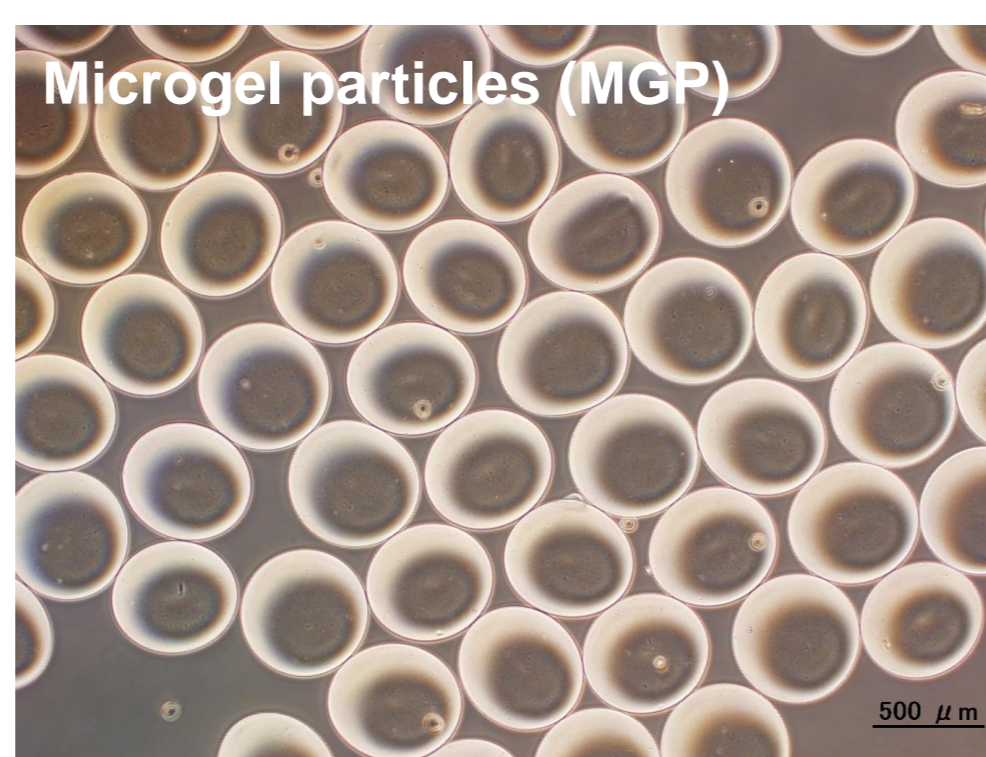
New cell culture bag system for mass production



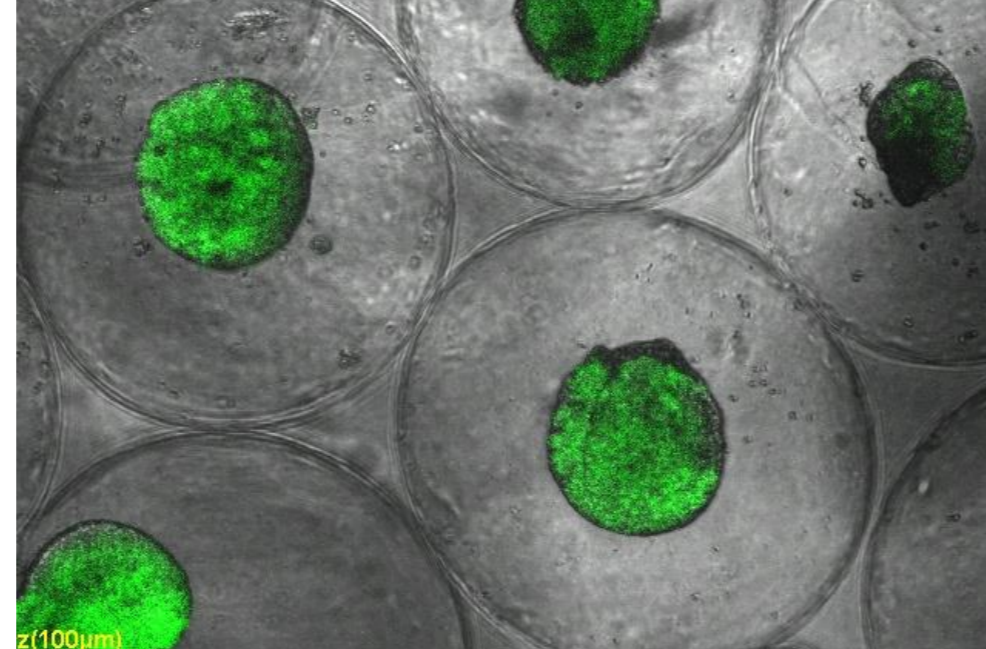
Mesenchymal stem cells (MSCs)



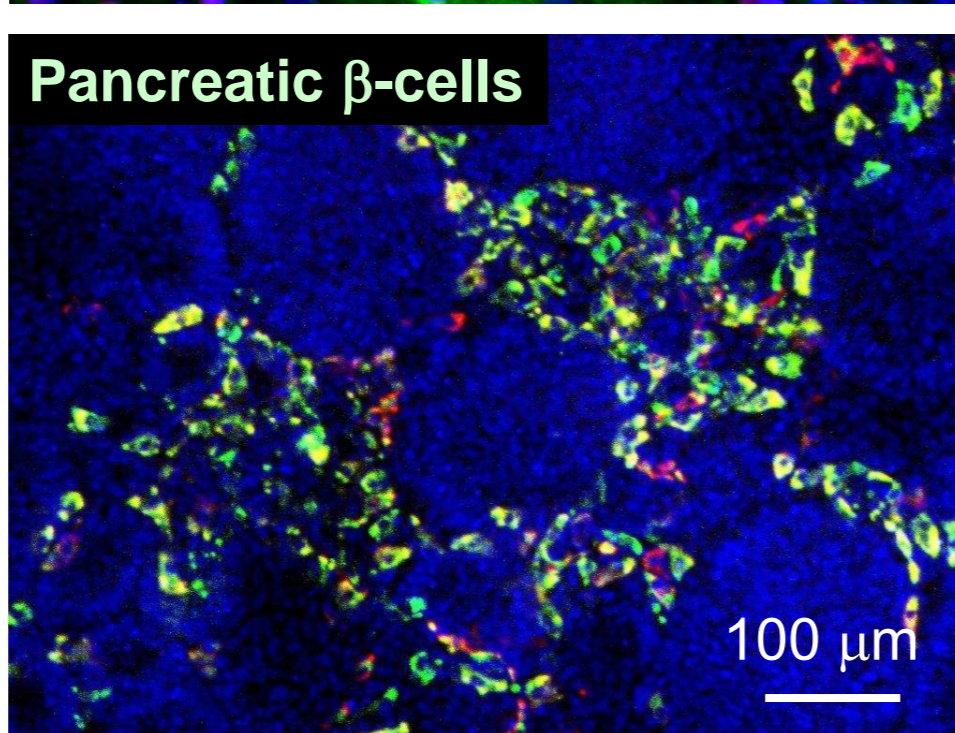
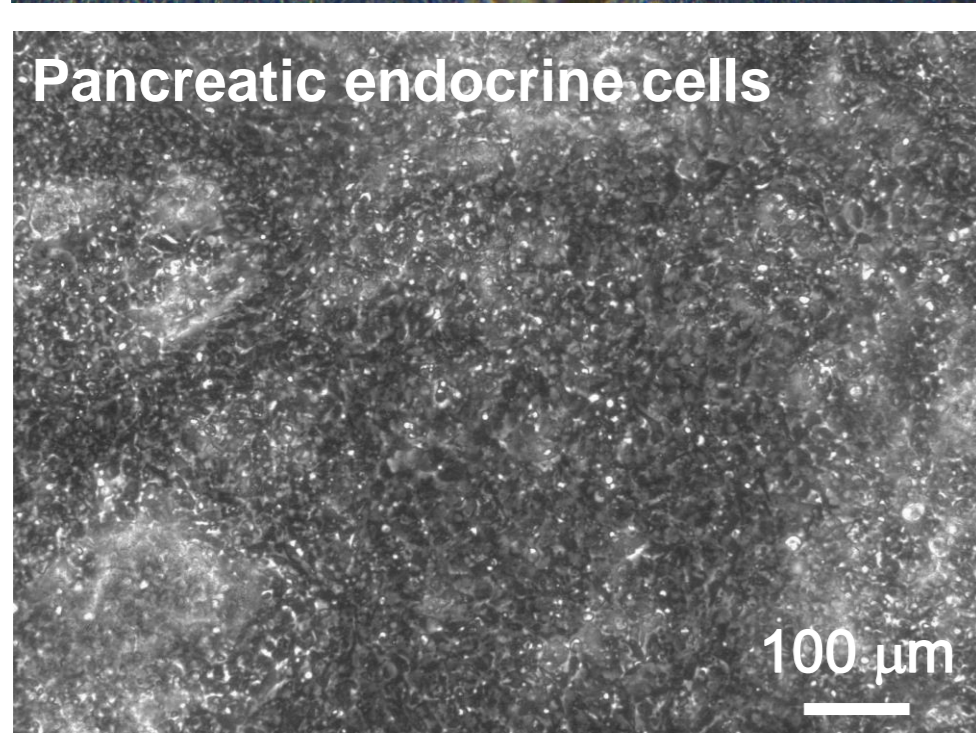
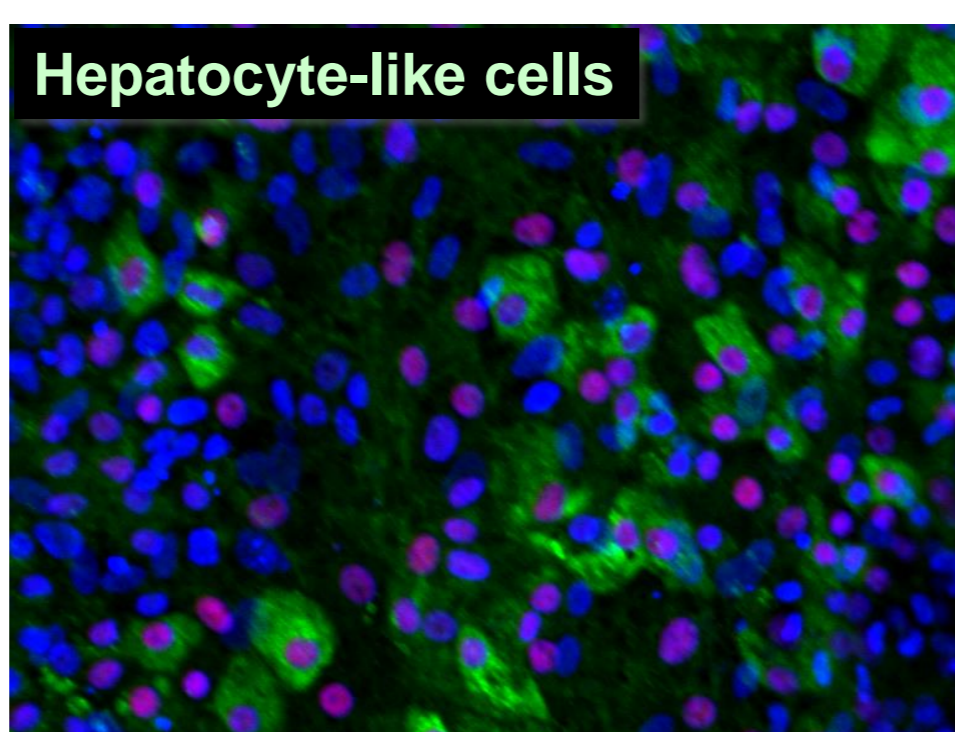
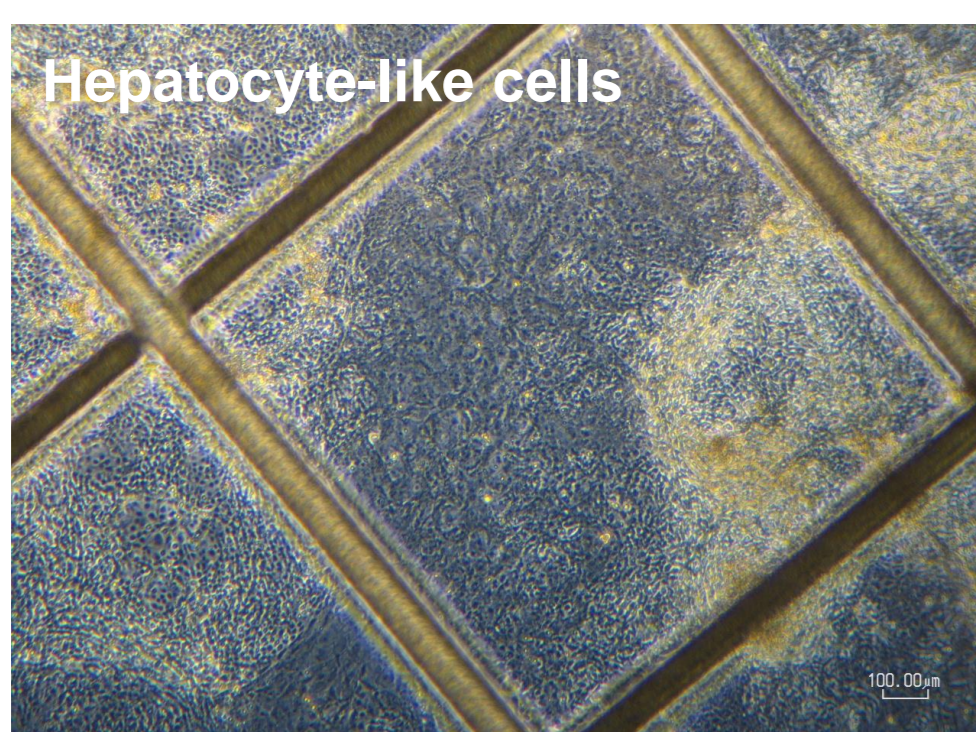
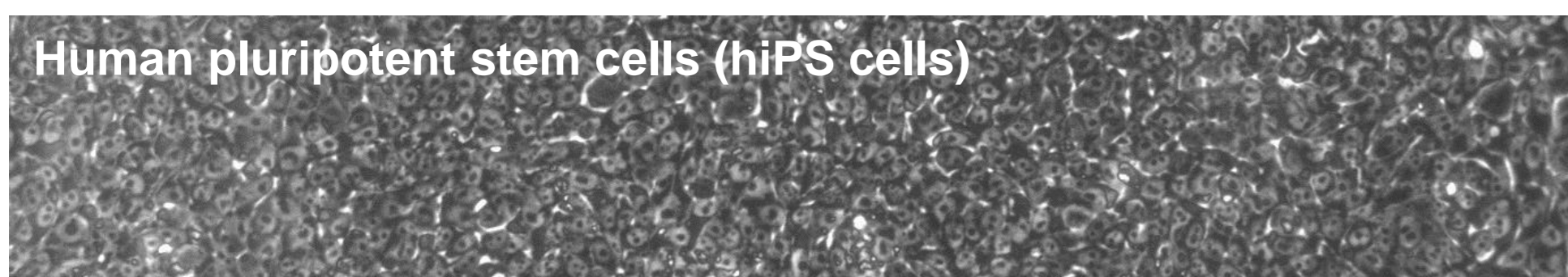
Mass production of iPS cells using microgel particles



iPS cells in MGP

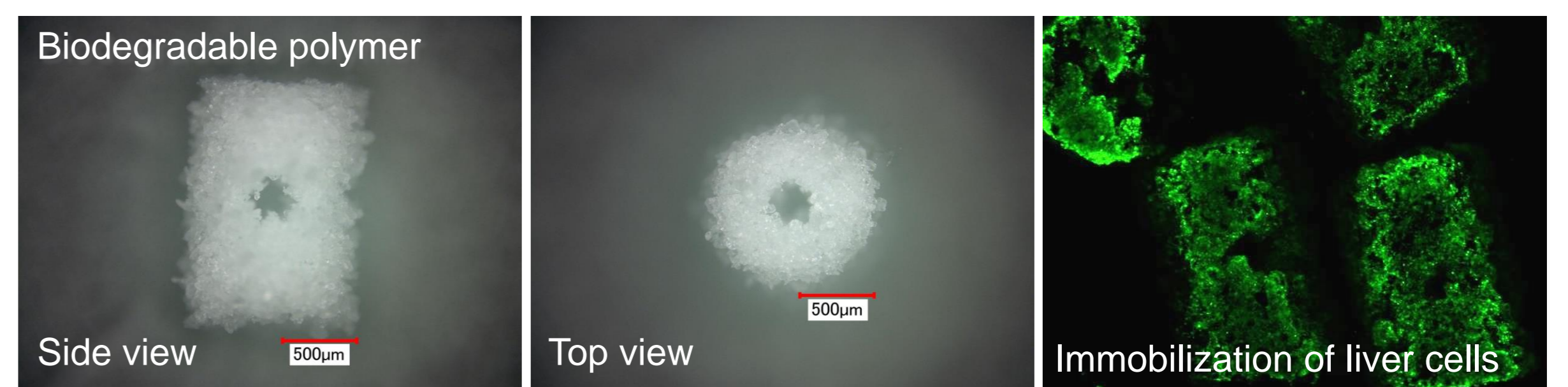


Differentiation control of iPS cells to hepatocyte-like cells/ pancreatic β -cells

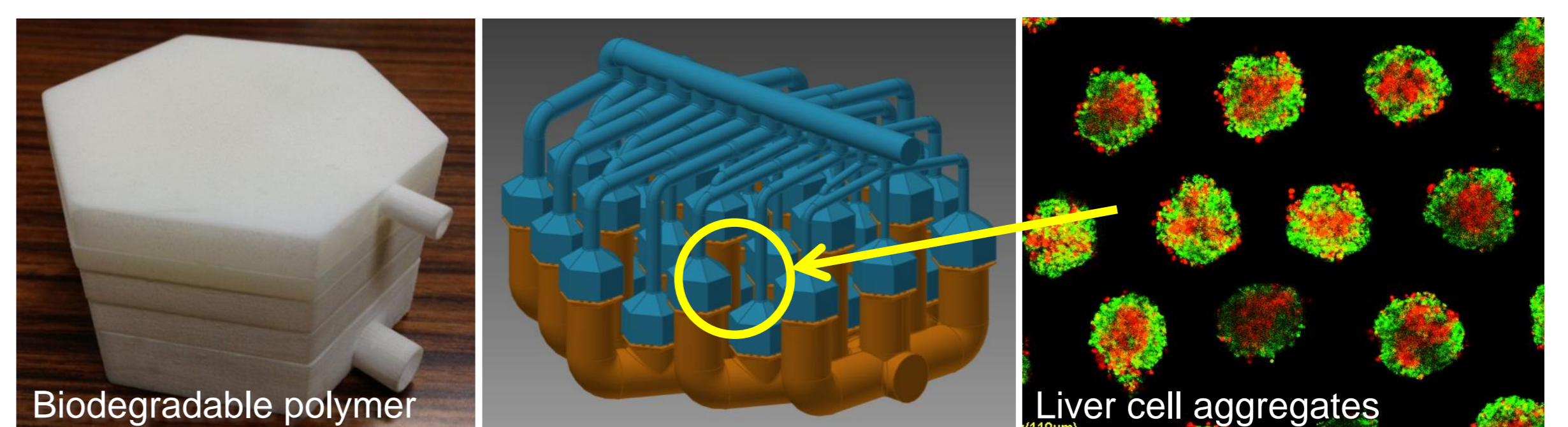


Implantable Tissues

Building blocks-based tissues for construction of large organs

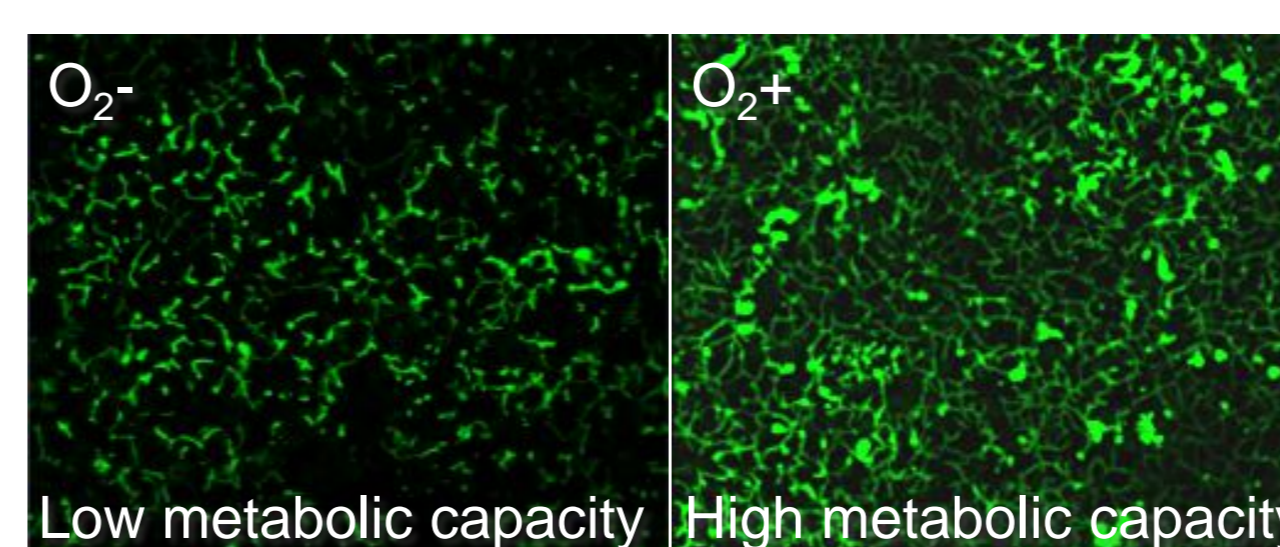


Development of the large artificial liver combined with 3D printer technology

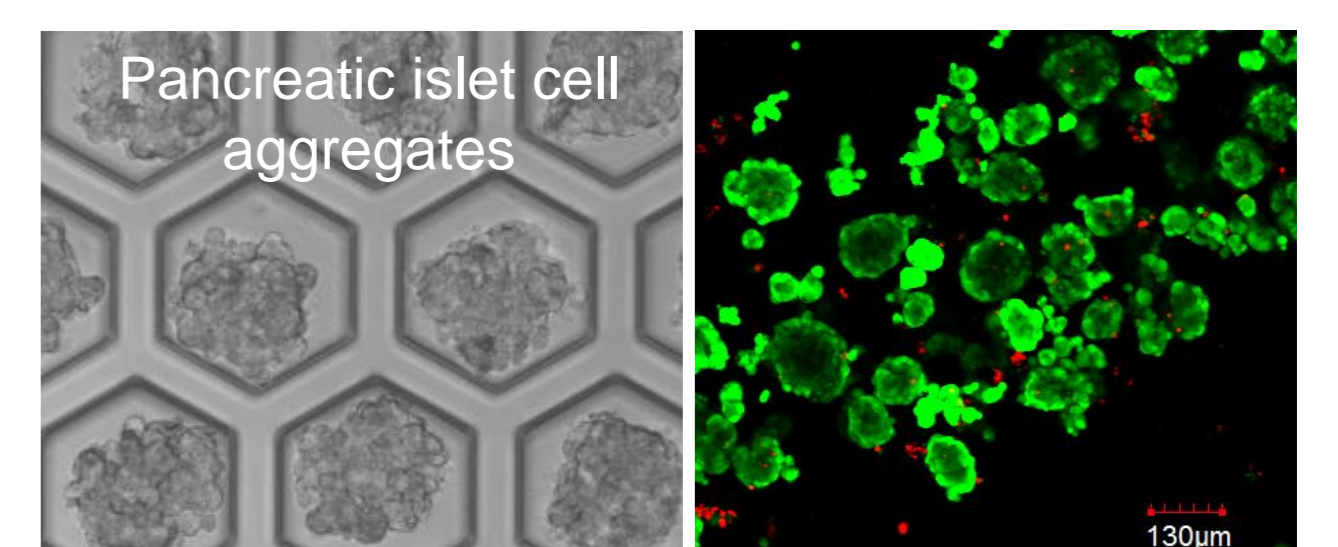


Cell-based Assays

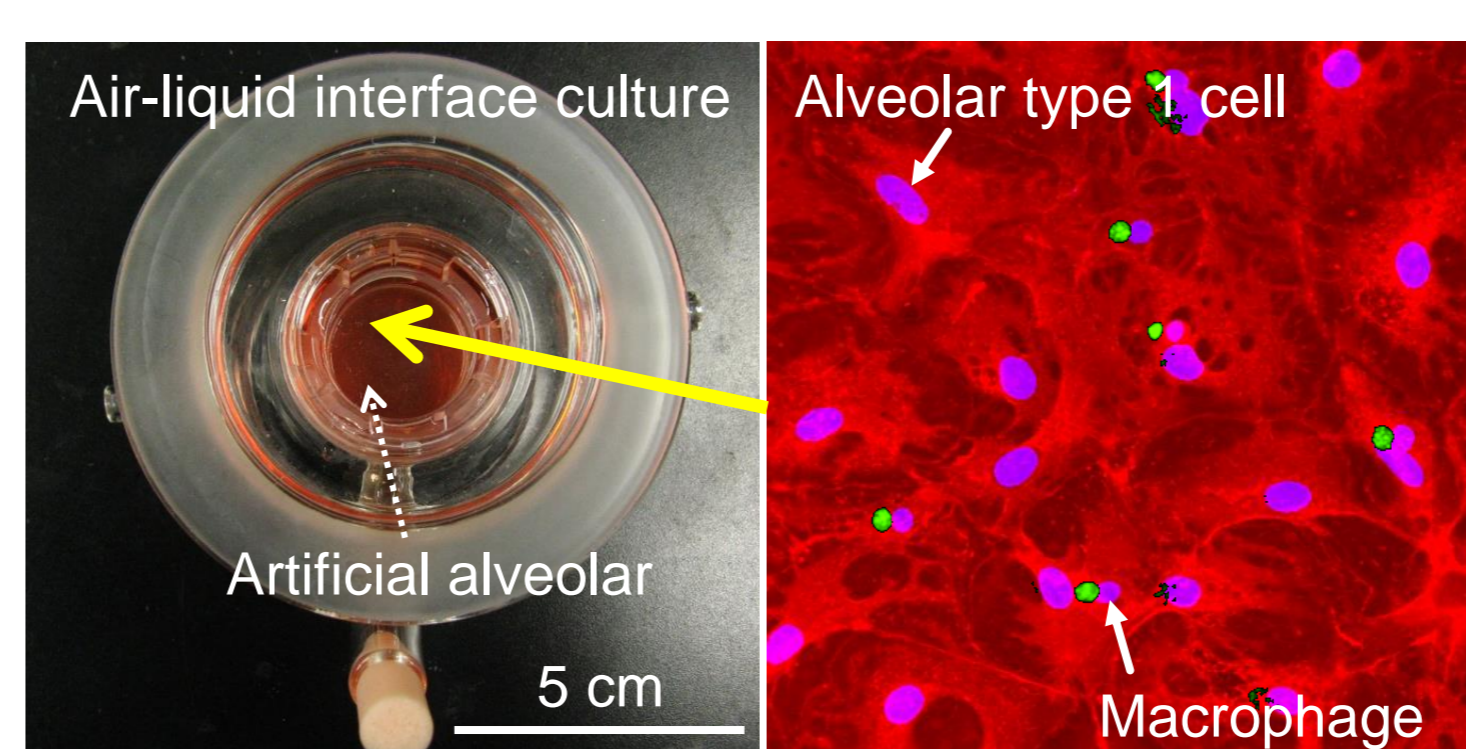
Enhancement of liver metabolic capacity under direct oxygenation and application to drug screening tests



Construction of pancreatic islet models for diabetes treatments



Development of alveolar cell-based assay systems for nanotoxicology



Development of new biosensor

