

# SAKAI LAB.

## [Tissue Engineering for Regenerative Medicine and Cell-Based Assay]

Center for International Research on Integrative Biomedical Systems

Department of  
Chemical System Engineering  
BioEngineering

Organs and Biosystems Engineering

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

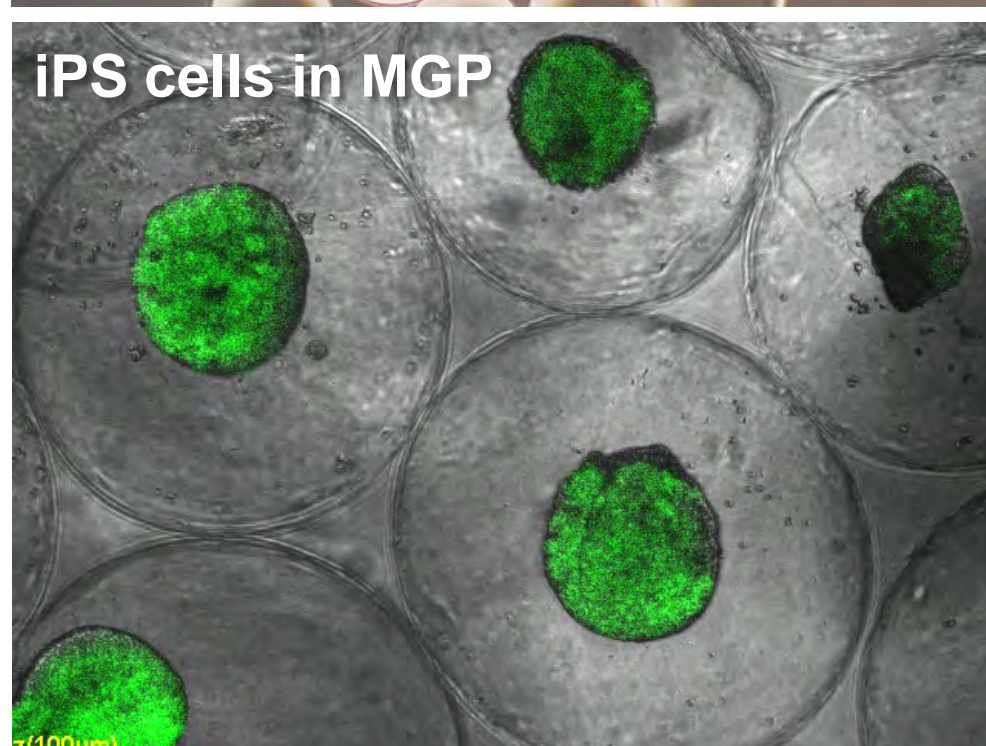
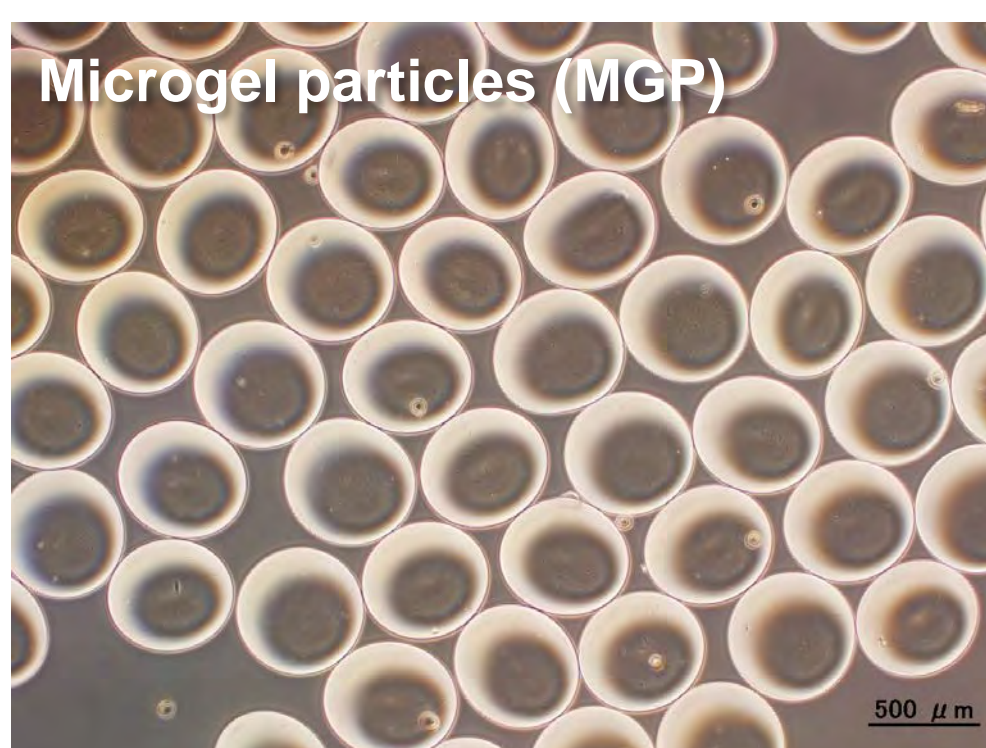
<http://www.cibis.iis.u-tokyo.ac.jp>

### Reconstruction and Utilization of Tissues

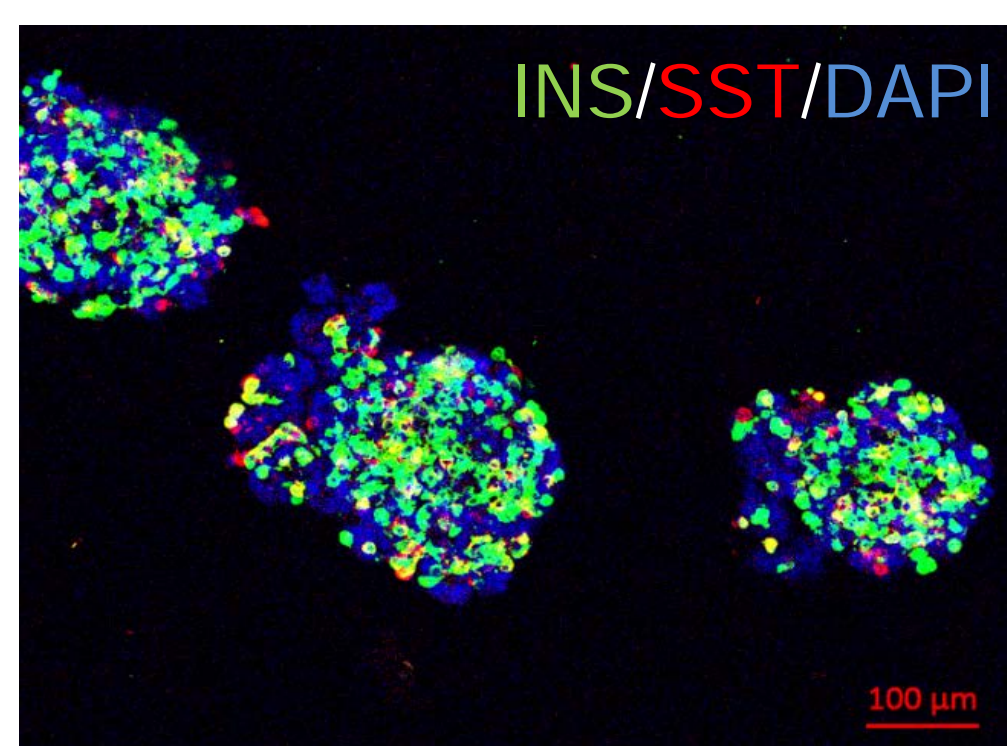
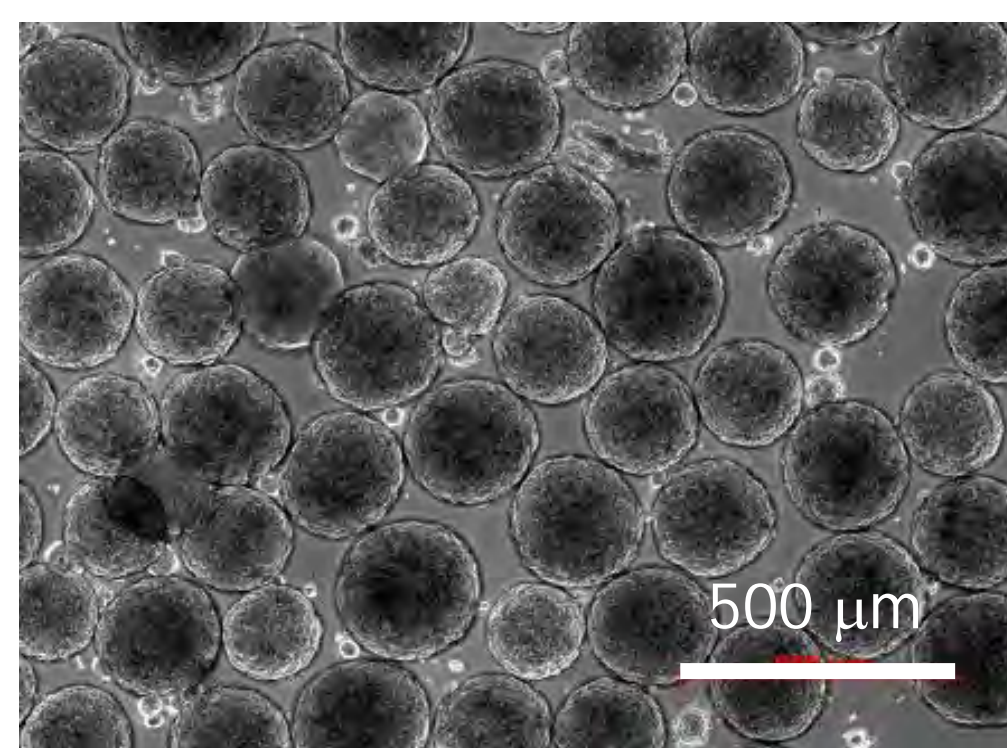
Toward applications to regenerative medicine for transplantation treatment and cell-based assays for drug and chemical screening, we have studied mass production and differentiation control of progenitor stem cells, construction of implantable tissues, and development of cell-based assays.

#### Mass Production and Differentiation Control of Progenitor Stem cells

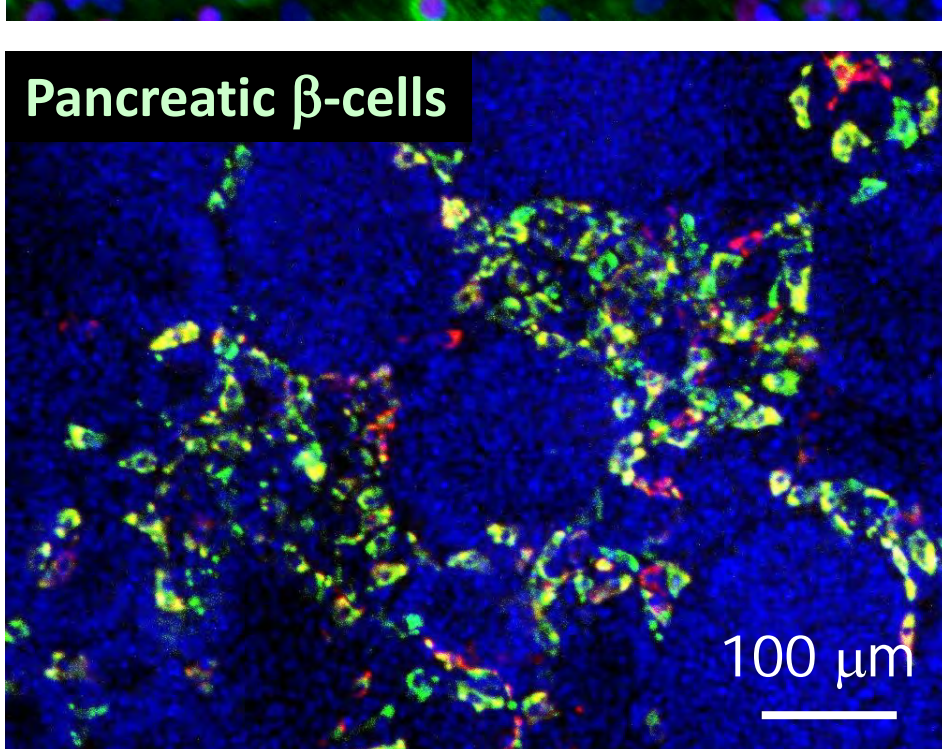
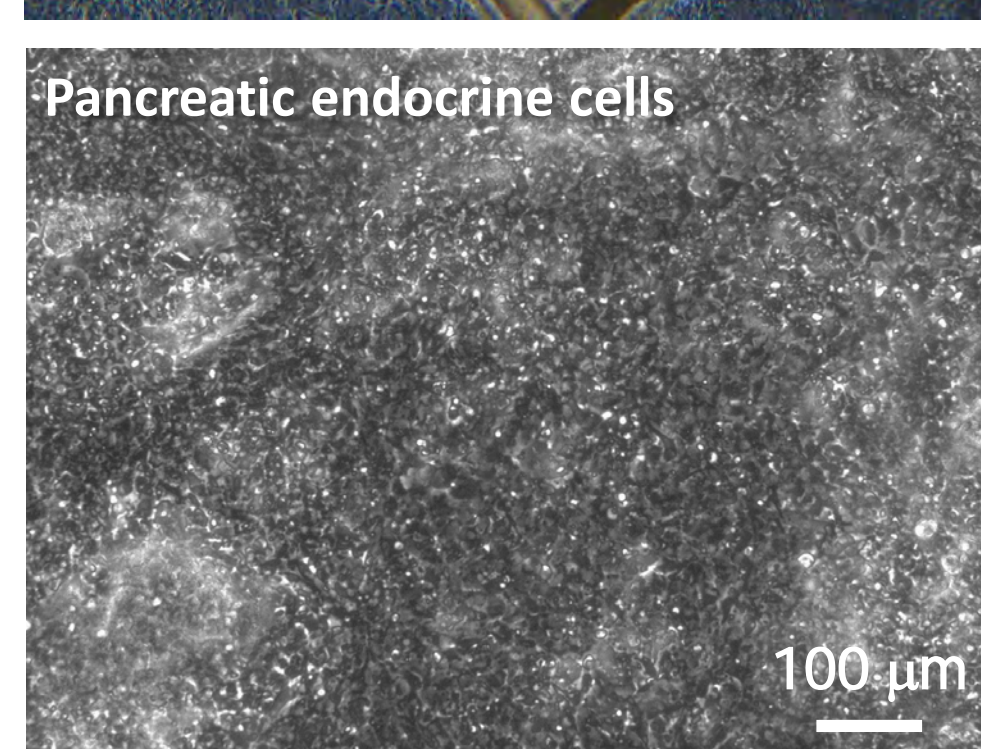
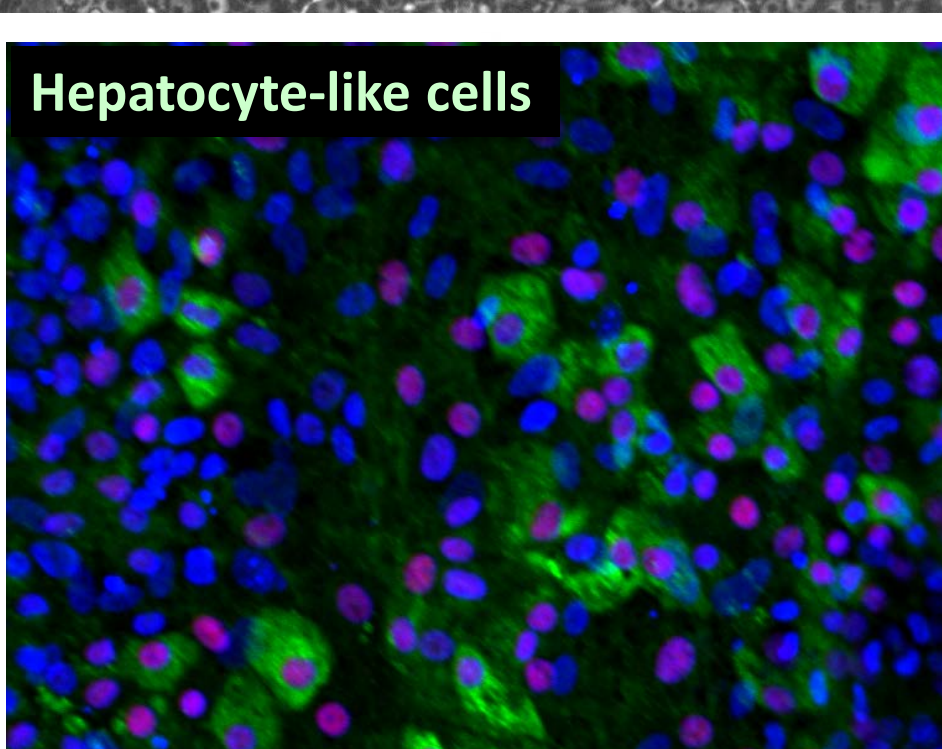
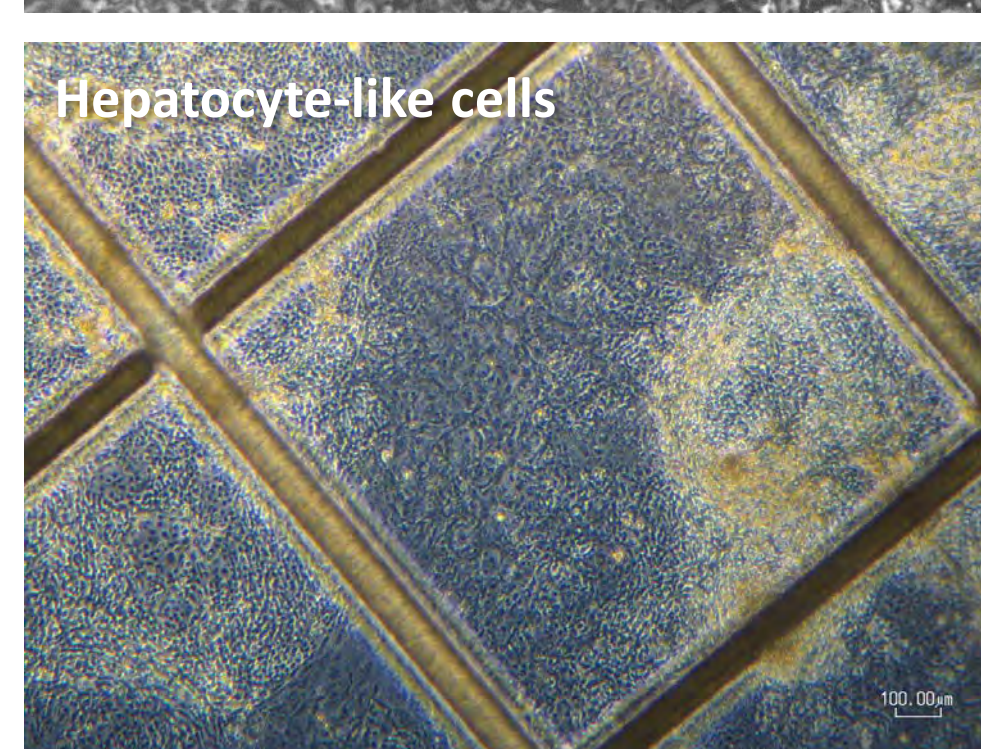
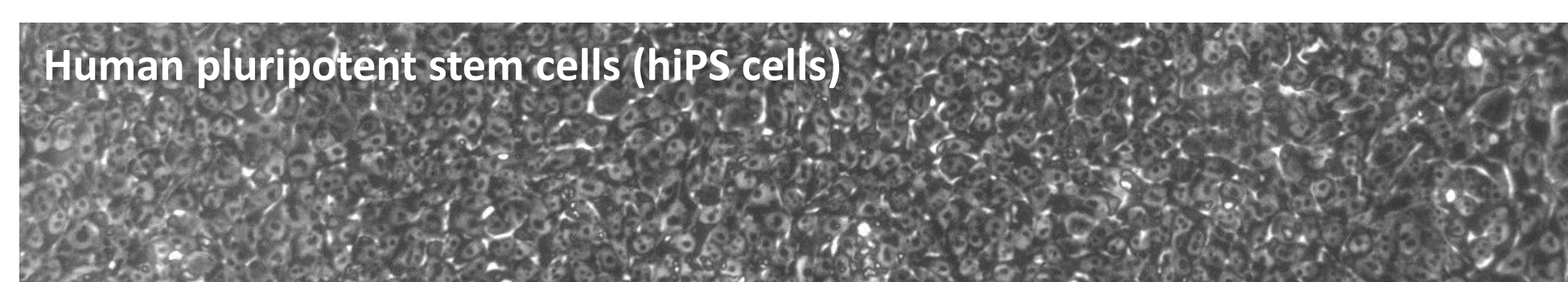
Mass production of iPS cells using microgel particles



hiPS derived pancreatic islet formation using suspension culture

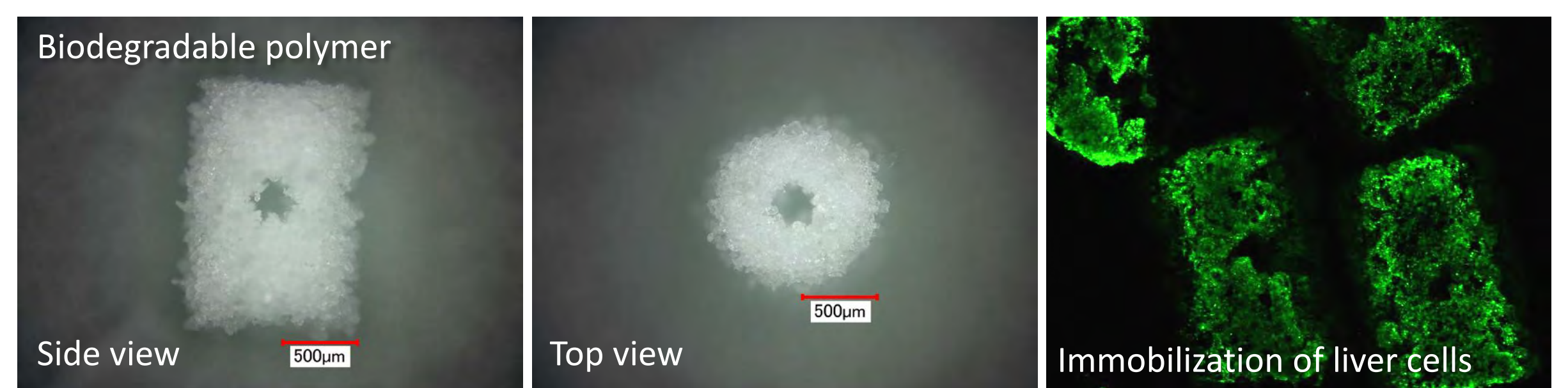


Differentiation control of iPS cells to hepatocyte-like cells/ pancreatic b-cells

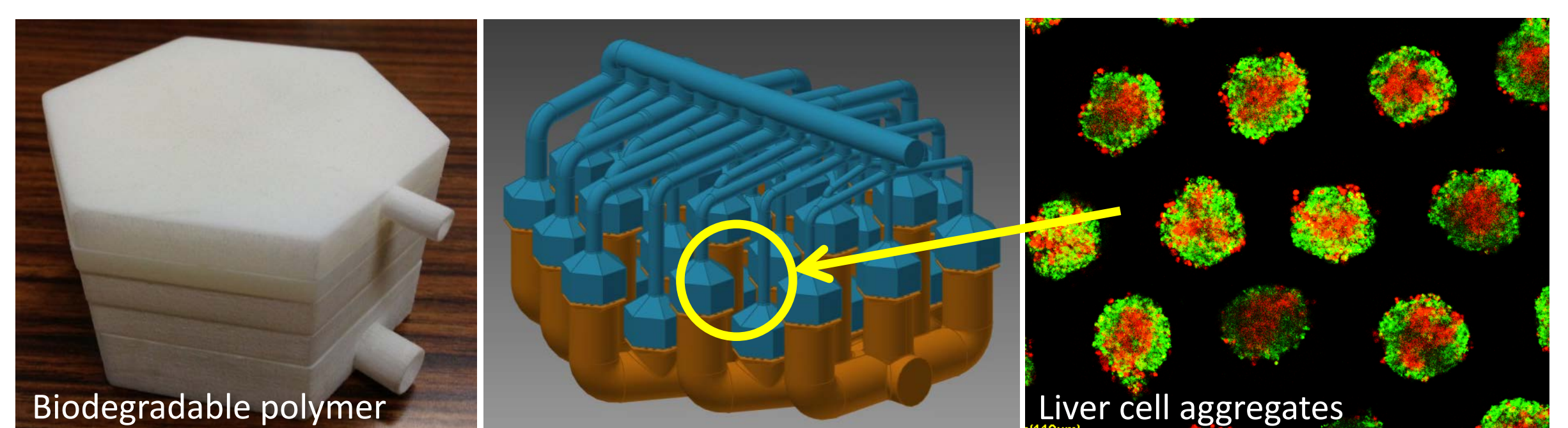


#### Implantable Tissues

Building blocks-based tissues for construction of large organs

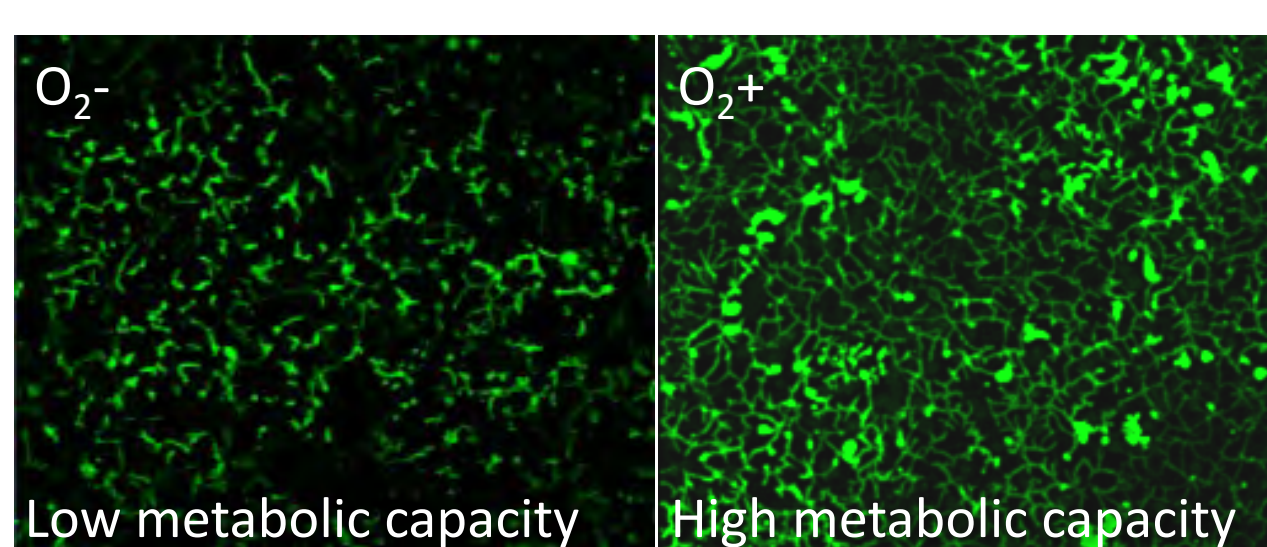


Development of the large artificial liver combined with 3D printer technology

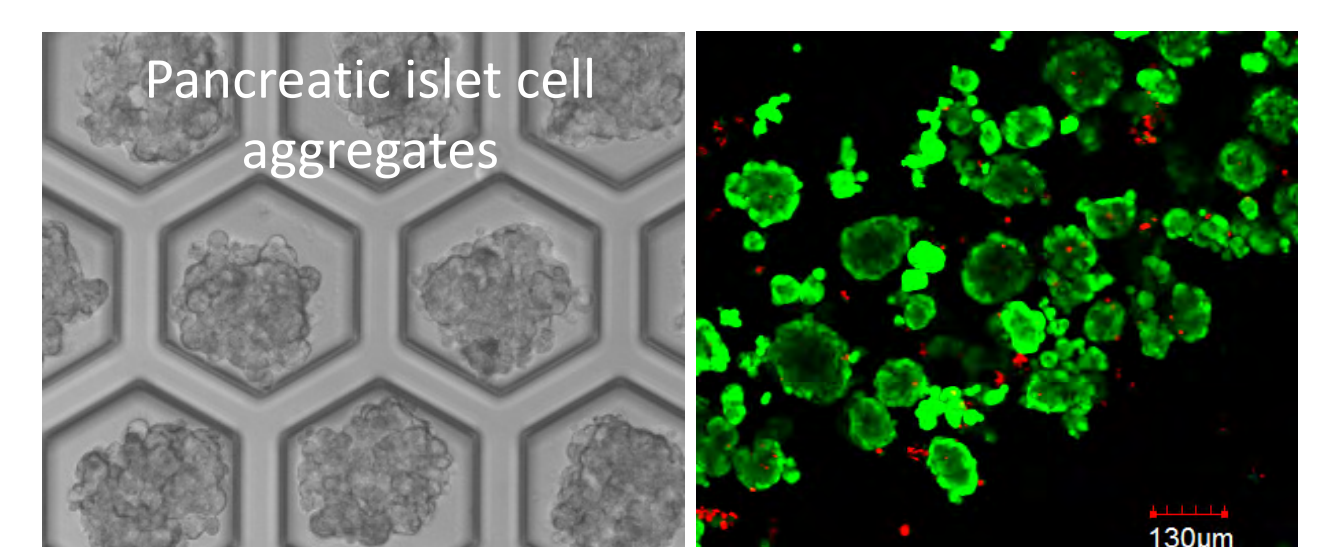


#### Cell-based Assays

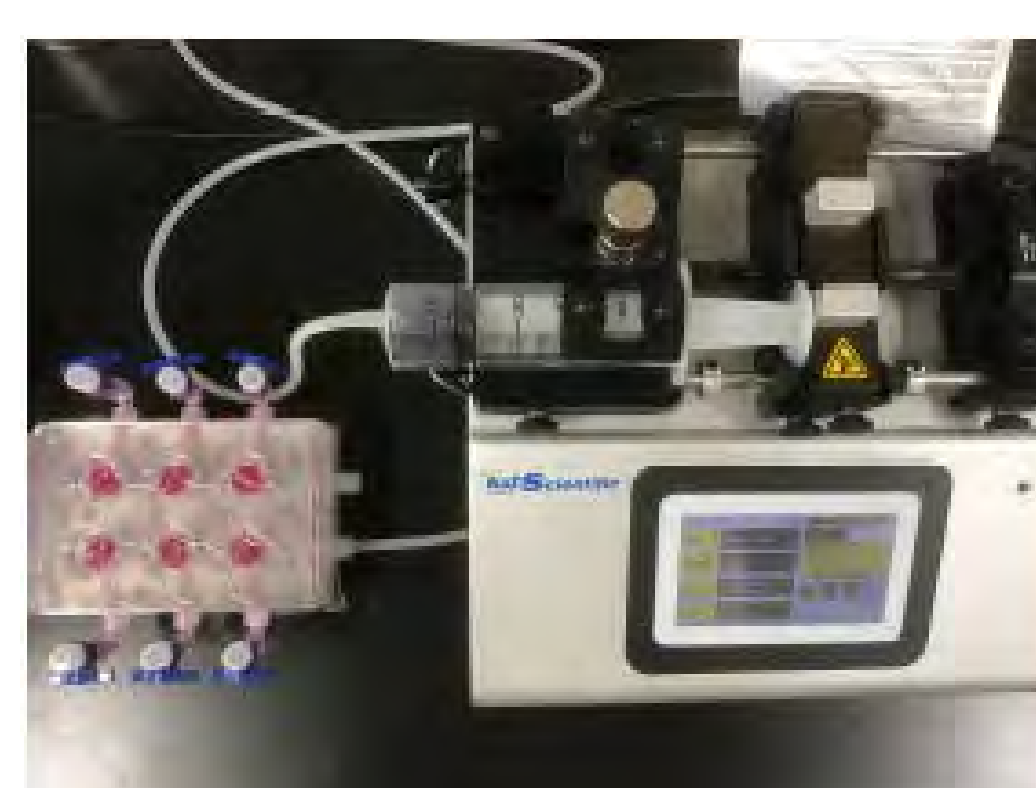
Enhancement of liver metabolic capacity under direct oxygenation and application to drug screening tests



Construction of pancreatic islet models for diabetes treatments



Development of small intestine epithelium culture system using elastic culture device



Development of new biosensor

