

SAKAI LAB.

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

Center for International Research on Integrative Biomedical Systems

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

Organs and Biosystems Engineering

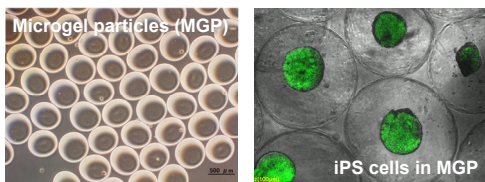
Department of
Chemical System Engineering
Bioengineering

Reconstruction and Utilization of Tissues

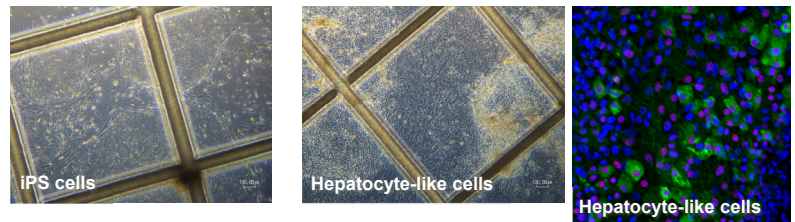
Toward applications to regenerative medicine for transplantation treatment and cell-based assays for drug and chemical screening, we have studied mass production and differentiation control of progenitor stem cells, construction of implantable tissues, and development of cell-based assays.

Mass Production and Differentiation Control of Progenitor Stem Cells

Mass production of iPS cells using microgel particles

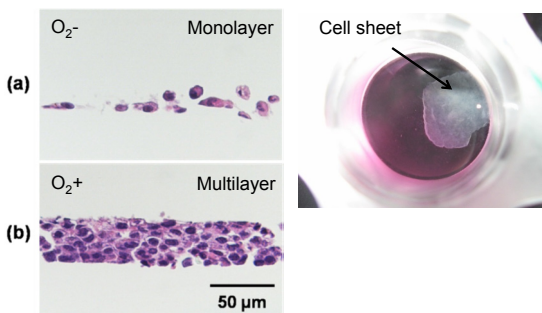


Differentiation control of iPS cells to hepatocyte-like cells

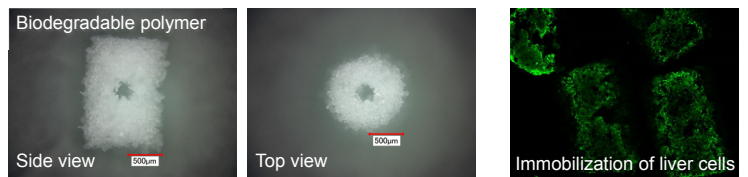


Implantable Tissues

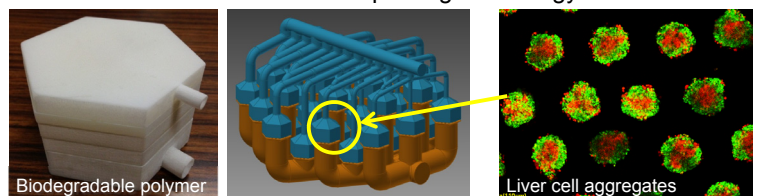
Construction of 3D cell sheets under direct oxygenation



Building blocks-based tissues for construction of large organs

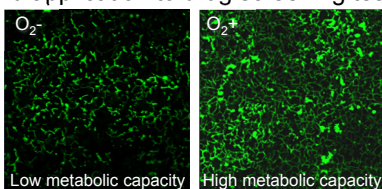


Development of the large artificial liver combined with 3D printing technology

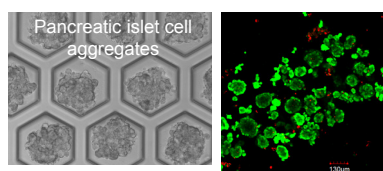


Cell-Based Assays

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



Construction of pancreatic islet models for diabetes treatments



Development of lung cell-based assay systems for nanotoxicology

