

SAKAI LAB.

[Development of Cellular Tissues for Transplantation and Application to the Evaluation of the Effects of Substances on the Human Body]

Department of Materials and Environmental Science

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

Organs and Biosystems Engineering

Department of Chemical System Engineering

Department of Bio Engineering

Reconstruction and Utilization of the Tissue

The general goal of our lab is the two- and three-dimensional organization of organ/tissue-derived cells, such as liver, pancreas, and lung cells, and their application to regenerative medicine for implant therapy and cell-based assays for drug and chemical screening.

Differentiation control of iPS cells in polymeric microcapsules and their application to mass culture system.

Optimization of culture conditions at oxygen-permeable plates and construction of the tissue with higher order physiological properties.

Formation of two- and three-dimensional tissues through microfabrication techniques and application to drug and chemical screening.

Development of microfluidic devices for cancer metastasis research.

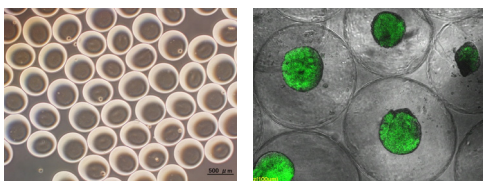
Development of implantable artificial tissue/organ modulus.

Development of lung models for the evaluation of atmospheric environment.

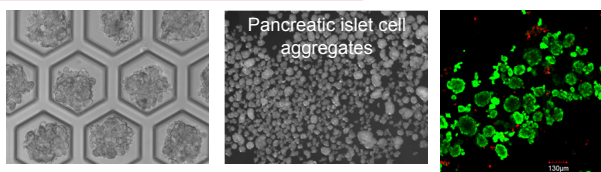
In vitro safety evaluation of nanomaterials (metal nanoparticles, carbon nanotube, and etc.).

Development of mathematical models for the human health risk assessment.

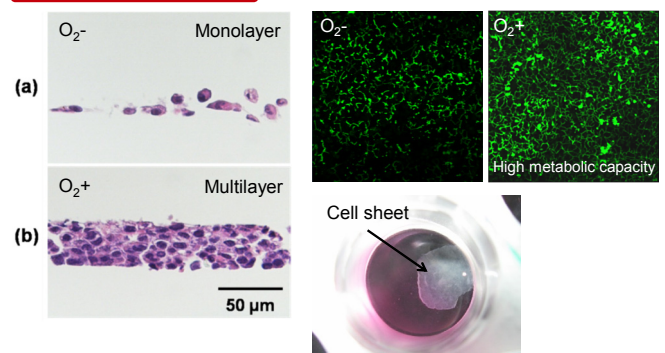
iPS cells in polymeric microcapsules



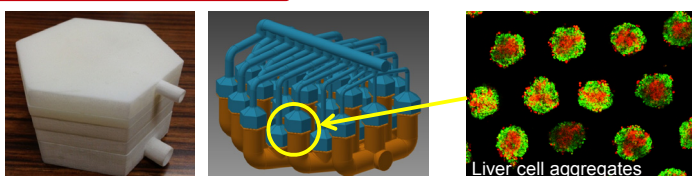
Three-dimensional spherical microtissues



Three-dimensional tissues



Implantable artificial liver module



Gas exposure device with a lung tissue

