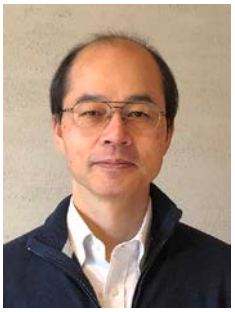
Biomedical Engineering



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Major Scientific Interests of the Group

Development of bioartificial organs by using tissue engineering approach. Establishment of novel 3D culture methods mimicking in vivo microenvironment.

Projects for Regular Students in Doctoral or Master's Programs

1) Development of ex vivo expansion system of hematopoietic stem cells
2) Development of bioartificial livers
3) Establishment of novel bioreactor systems applicable to bioartificial organs

Study Programs for Short Stay Students (one week – one trimester)

1) 3D culture techniques including preparation of 3D scaffolds, cell seeding into the scaffolds, cryopreservation of 3D culture cells, and assays of the cells.

Selected Publications

1) **Miyoshi H**, Sato C, Shimizu Y, Morita M. Expansion of mouse hematopoietic stem/progenitor cells in three-dimensional cocultures on growth-suppressed stromal cell layer. *Intern J Artif Organs*, 2019. DOI:10.1177/0391398819827596.
2) **Miyoshi H**, Morita M, Ohshima N, Sato C. Expansion of mouse hematopoietic progenitor cells in three-dimensional cocultures on frozen-thawed stromal cell layers formed within porous scaffolds. *Exp Hematol*, 43: 115-124, 2015.
3) **Miyoshi H**, Ohshima N, Sato C. Three-dimensional culture of mouse bone marrow cells on stroma formed within a porous scaffold: influence of scaffold shape and cryopreservation of the stromal layer on expansion of haematopoietic progenitor cells. *J Tissue Eng Regen Med*, 7: 32-38, 2013.
4) **Miyoshi H**, Ehashi T, Kawai H, Ohshima N, Suzuki S. Three-dimensional perfusion cultures of mouse and pig fetal liver cells in a packed-bed reactor: effect of medium flow rate on cell numbers and hepatic functions. *J Biotechnol*, 148: 226-232, 2010.
5) Koyama T, Ehashi T, Ohshima N, **Miyoshi H**. Efficient proliferation and maturation of fetal liver cells in three-dimensional culture by stimulation of oncostatin M, epidermal growth factor, and dimethyl sulfoxide. *Tissue Eng A*, 15: 1099-1107, 2009.