

FUJII T. LAB.

[Applied Microfluidic Systems]

Center for International Research on Integrative Biomedical Systems

http://www.microfluidics.iis.u-tokyo.ac.jp/

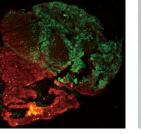
Microfluidics, cell engineering, underwater technology and molecular engineering

Precision Engineering / Bioengineering

Applied Microfluidic Systems

From Deep-Sea Application to Cell Engineering

Soft actuator Structural analysis in vitro biochemical networks Mn detection in deep sea Underwater AFM We have developed a new unique soft actuator based on "Microhydraulics" Targeting a behavior and encoding it in DNA-based circuits, a bistable memory Integrated In Situ Analyzer (IISA) for Mn detection has been developed. All A compact AFM system, which is mountable on underwater vehicles, is Numerical simulation based on FEM is performed to analyze and evaluate studied to investigate the nanoscopic necessary components are integrated which uses microfluidic channels and hyper-elastic deformation of silicone circuit that can be switched back and rubber actuating devices forth was demonstrated successfully. amples in deep sea and in situ ntegrated pumps to create 3D motion into a compact body z axis displacement [mm] Microfluidic control Environmental measurement Flow measurement Highly-integrated system Fluid mechanics **Microfluidics** Ultimate environment Nano-Bio Deep Sea in situ Nanofluidic device Molecular Measurement Molecular analysis Engineering Cell Engineering Cell culture Medical engineering Cell chip Miniaturization & Integration Microfabrication techniques ■ High accuracy & high efficiency MEMS/NEMS ■ Low cost & mass production Photolithography Microfluidic device Micro environment ■PDMS molding Cell / tissue showcasing Controlled differentiation Dynamic concentration control Single cell analysis CTC analysis A cell/tissue showcase system which Mouse pluripotent stem cells are seeded in a microchannel and their Microfluidic cell culture system which We are developing a micro-well array We perform single-cell PCR and immunostaining of circulating tumor cells (CTCs) to show usefulness in regulates fluidic/adhesive conditions is enables dynamic control of a signal device to investigate cells individually developed by integrating artificial biodifferentiative state was controlled molecule concentration has been using key technologies such as EP, spatially using microfluidic techniques. nterface into a microfluidic device developed for cell signaling study. electroporation and microfluidics diagnosis or treatment of cancer



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