



APPLIED
MICROFLUIDIC
SYSTEMS
LAB

FUJII T. LAB.

[Applied Microfluidic Systems]

Centre for International Research on MicroNano Mechatronics

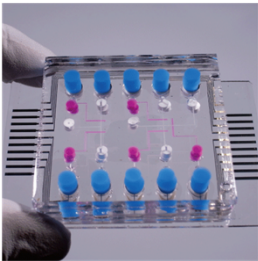
<http://www.microfluidics.iis.u-tokyo.ac.jp/>

Microfluidics, molecular engineering, cell engineering & underwater technology

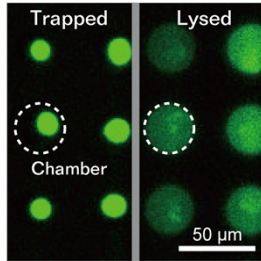
Precision Engineering / Bioengineering

From Deep-sea Application to Cell Engineering

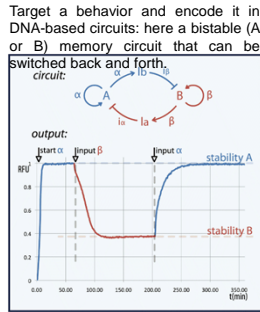
Micro pump-valve system
2 fluidic channel networks, 10 electro-osmotic pumps and 5 membrane-type valves are successfully integrated into a monolithic PDMS device.



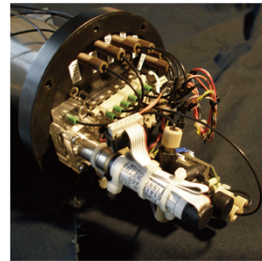
Single-cell analysis
Mammalian cells are trapped and lysed using a micro chamber array device. Dielectrophoresis and electroperoration are used for single-cell manipulation.



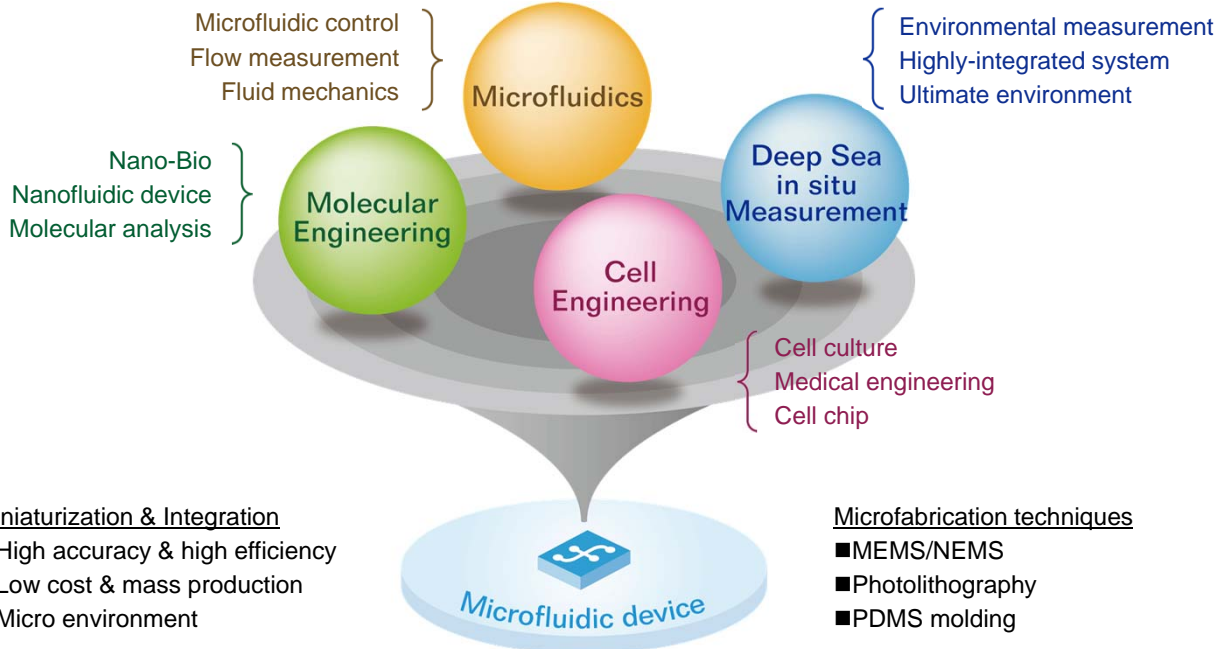
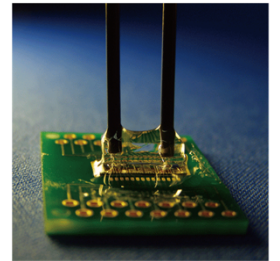
in vitro biochemical networks



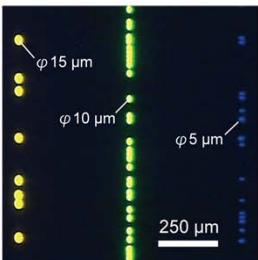
Mn detection in deep sea
Integrated In Situ Analyzer (IISA) for Mn detection has been developed. All necessary components are integrated into a compact body.



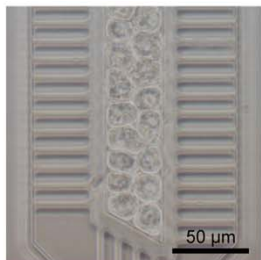
in situ pH monitoring
An integrated microfluidic system has been developed, which is available for in-situ pH measurement in deep sea due to its unique calibrating function.



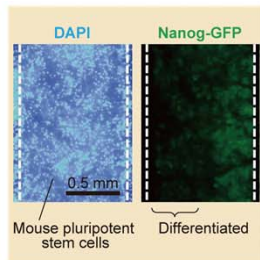
Size-based cell sorter
A unique cell sorting device with a vernier structure has been developed. The beads with different diameters were arrayed along the microchannel.



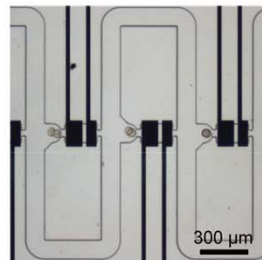
in vitro liver cell culture
Hepatocyte cells are aligned in two lines and cultured inside a microfluidic channel to mimic the in vivo liver structure and function.



Controlled differentiation
Mouse pluripotent stem cells are seeded in a microchannel and their differentiative state was controlled spatially using microfluidic techniques.



Embryo culture system
Mammalian embryos are treated automatically on a dynamic micro array, which has functions of trapping and collection for embryo culture.



Cancer cell detection
An adhesion-based cell separation to detect metastatic cancer cells is performed using a peptide aptamer-coated microchannel surface.

