



TIXIER-MITA LAB.

[Integrated Bio CMOS/MEMS Sensors]

Centre for International Research on MicroNano Mechatronics

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Integrated CMOS/MEMS for Biological and Bio-chemical Analyses and Sensing

Integrated Bio CMOS/MEMS Sensors

Integrated CMOS/Micro-Systems for Biological and Bio-chemical Analyses and Sensing

More and more precise and sensitive tools are needed to investigate further in the biology field: to track disease, develop new drugs, or for more fundamental understanding of biological phenomena. Here, new tools for biological cells and chemical analyses are proposed. They are hybrid systems with integrated: electronics (using Large Scale Integrated or Thin Film Transistor technologies), micro-fluidics, and micro-structures.

- ◆ Electronics integrated on the device by LSI or TFT technology: faster detection, smaller energy consumption.
- ◆ Miniaturization and micro-structurization, thanks to the micro-fabrication: improvement of portability and the sensitivity.
- ◆ Integrated micro-fluidic inside the LSI: for a even more portable system.

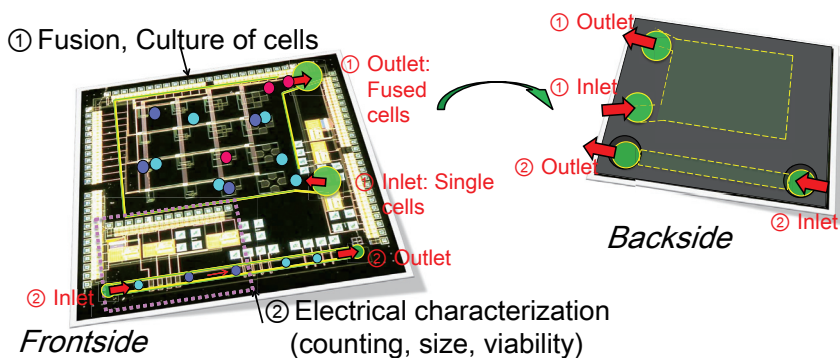


Fig.1 CMOS / MEMS devices for biological cells analyses with integrated micro-fluidics.

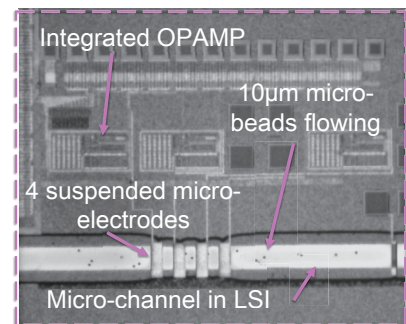


Fig. 2 Integrated micro-fluidics in LSI. Test with μbeads.

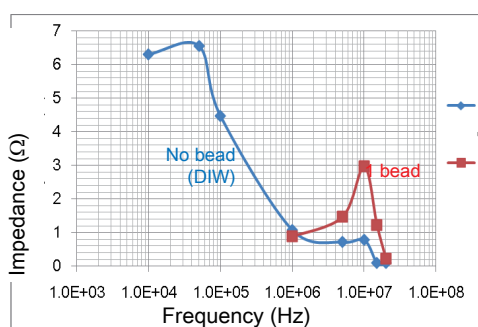


Fig.3 4-probe measurement on beads with 4 micro-electrodes

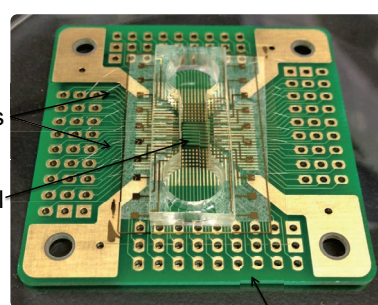


Fig. 4 LSI Interface of biological neurons with artificial Silicon neurons.

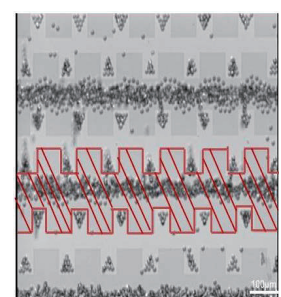


Fig. 5 TFT technology used as a new substrate. Beads manipulation tests on an ITO/glass sample.