



Microdevices for biomedical and IoT applications

Quantum Nanoelectronics Research Center, FIRST

http://www.tokuda-lab.ee.e.titech.ac.jp/index_e.html

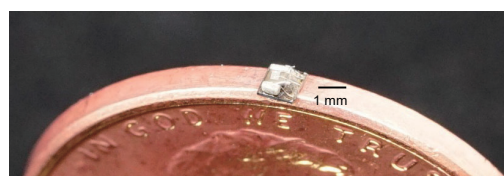
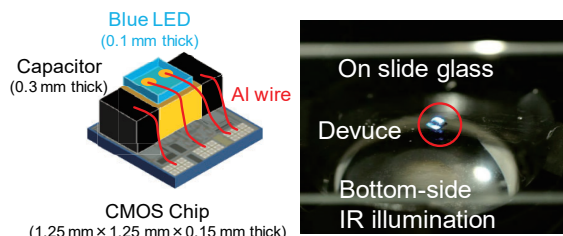


- CMOS-controlled photovoltaic power transfer and energy harvesting
- Wireless, ultra-small Implantable optogenetic stimulator
- IoT micronode device for "Bottom-up IoT" technology
- Implantable glucose sensor
- On-chip opto-electronic image sensor

New device technologies are proposed and demonstrated based on CMOS integrated circuits combining unique device structures and materials.

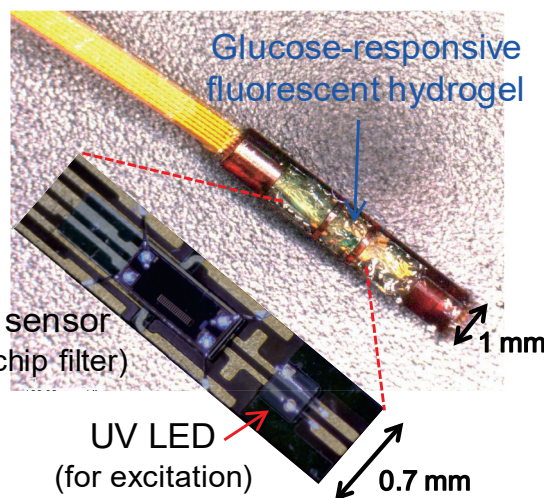
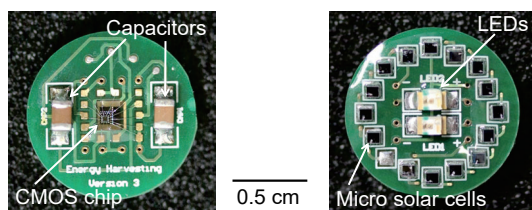
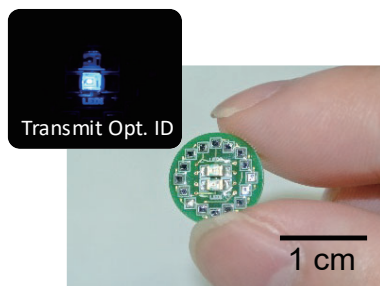
We explore a new application frontier for electronics device technology, including implantable biomedical, and Internet for Everything (including non-electric items such as living bodies).

Tokuda lab. is in Bldg. S-9 in Ookayama campus.



Implantable optogenetic stimulator

- Based on CMOS-controlled integrated optical power receiver
- World-smallest volume and weight (1mm³, 2.3mg)



Battery-less optical beacon device

- Sequential operation was implemented
- Optically-powered, optically ID transmitter
- Adaptive operation to powering illumination

Implantable glucose sensor

- Based on implantable image sensor & glucose-responsive fluorescent hydrogel technologies
- Optical power transfer will be integrated for wireless device