

Fully-integrated Microfluidic Cartridges for In-vitro Diagnostics

1. Microfluidic cartridge

- Fully integrated, self-contained cartridges for in-vitro diagnostics
- Suitable for running immuno assays
- Integrated liquid reservoirs for storing reagents (Fig. 1)
- 8 reservoirs for reagents (up to 130µl)
- 1 sample reservoir
- Low-cost pumps for integrated fluid handling (Fig. 2)
- Completely polymer-based

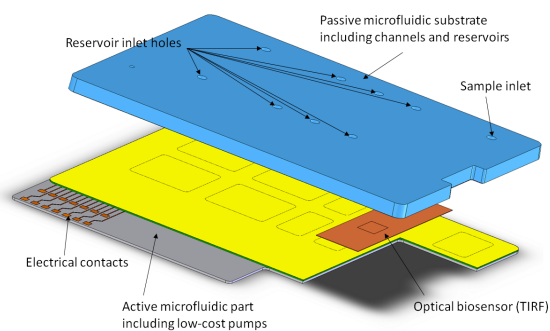


Fig. 1: Schematic of fully integrated cartridge

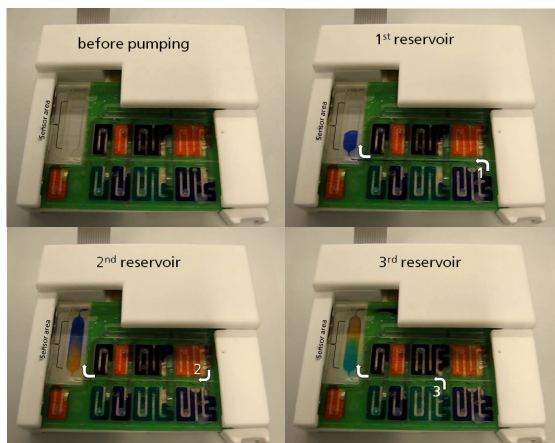


Fig. 2: Fully assembled (and filled) cartridge: Emptying of the first three reservoirs by using the integrated low-cost micropumps

2. Micropumps

- Based on electrochemical generation of a gas inside a hydrogel
- Very low complexity
- No additional fluidic interfaces
- No additional packaging
- High performance
- Single-shot pumps
- Flow rates up to 2µl/s

3. Sensors

- Cartridge suitable for holding both electrochemical and optical biosensors
- *Example:* Optical biosensor based on total internal reflection fluorescence (TIRF)¹ → Sensor foils fabricated by polymer hot- embossing using a silicon master (Fig. 3)

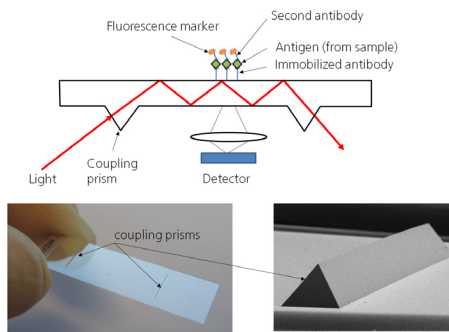


Fig. 3: Hot-embossed TIRF-sensor (Working principle, photograph and SEM picture)

4. Contact

Dipl.-Ing. Joerg Nestler
Phone: +49 371 45001-240
Fax: +49 371 45001-340
Email: joerg.nestler@enas.fraunhofer.de

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