



Systems



Fully-Integrated Microfluidic Cartridges for In-Vitro Diagnostics

Fast Facts

- Integration of immunological and molecular biological assays
- Proven for various sensor principles
- Integrated disposable micropumps
- No fluidic interfaces thus no risk of contamination
- Compact size

General Description

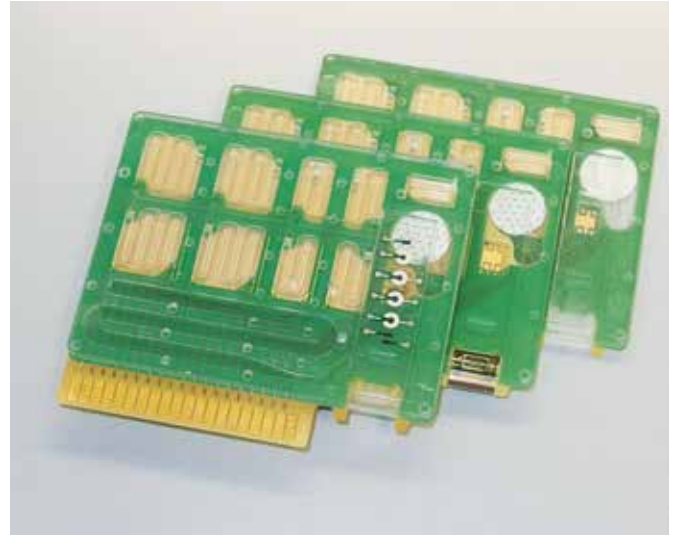
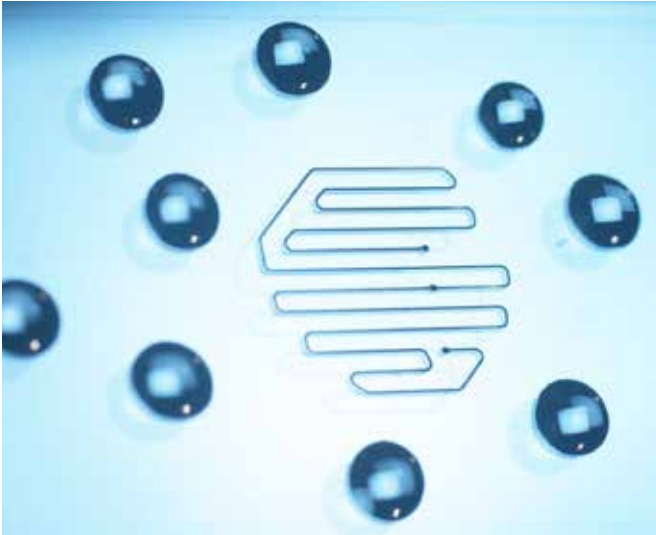
Microfluidic systems enable the miniaturisation of bio-chemical assays in small integrated systems. Complex and labour intensive manual fluid handling is substituted by automatic fluid handling. Such integrated system do not rely on trained personel and are highly reproducible due to the low necessary user interaction. Fraunhofer ENAS develops microfluidic solutions based on a patented technology of integrated and disposable micro pumps. The microfluidic plattform is compatible with a large variety of sensor principles like antibody and DNA microarrays as well as electro-chemical detection.

Microfluidic Cartridges

- Fully integrated, self-contained cartridges for in-vitro diagnostics
- Suitable for immunoassays and molecular diagnostics
- Contains low-cost pumps for integrated fluid handling
- Integrated liquid reservoirs for storing reagents and sample
- Integrated heating (e.g. for hybridization) possible
- Integrated bubble traps
- Only one fluidic interface for sample inlet necessary
- Low risk of contamination
- Technology for semi-automated fabrication



Rapid DNA tests for the detection of acute infections.



Integrated Micropumps

- Based on an electrochemical process
- Simple control by electrical current
- Very low complexity
- Optimized for disposable applications
- Typical flow rates in the range of 0.1 to 1 $\mu\text{l/s}$

Typical Applications

- Human diagnostics
- Veterinary diagnostics
- Environmental testing
- Food testing

Services

- Development of microfluidic solutions for decentralized testing
- Miniaturization and integration of existing bio-assays
- Feasibility studies based on existing cartridges
- Assistance in assays development (together with partners)
- Development of fully customized microfluidic components and systems
- Interfacing and integration of various kinds of biosensors
- Complete development chain from prototyping to production scale-up
- Development and customization of required control electronics and software

In cooperation with



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