



## Microfluidics for Assay Miniaturization

HSG-IMIT (Villingen)



### BACKGROUND and BASICS

Microfluidics enables

- Miniaturization
- Integration and
- Automation

of biochemical assays (Lab-on-a-Chip).

Lab-on-a-Chip enables

- Point of Care solutions; fast time-to-result; saving reagents by using small liquid volumes

Lab-on-a-Chip needs

- efficient, simple and robust microfluidics;
- wide spectrum of competences in engineering, devices, liquid handling, biochemistry.



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Assay protocol implemented on a CD-like lab-on-a-chip system operated on a CD player

### CONCEPT and SOLUTION

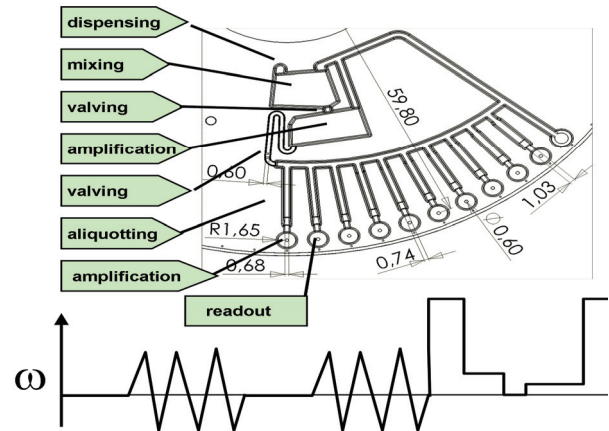
HSG-IMIT developed solutions that allow a fast and cost efficient implementation of any application specific assays on two supported platforms:

- Centrifugal microfluidics
- Plug based microfluidics

A systematic development workflow is used:

- Schematic assay description
- Compilation into microfluidic design
- Rapid prototyping
- Functional testing

Fast turnaround time (20 working days from assay description to a prototype) is enabled based on a detailed Design Handbook of fluidic operations at the HSG-IMIT.



Design of PCR cartridge for the centrifugal platform.

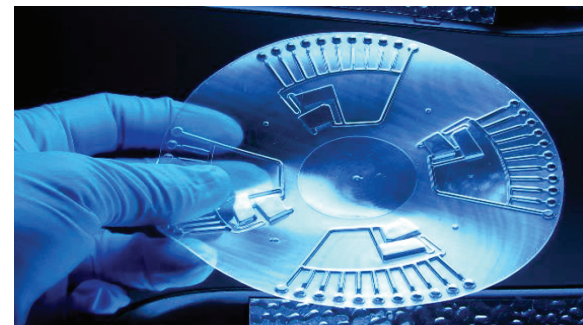
### STATUS and OUTLOOK

Examples of successful assay implementations:

- clinical chemistry
- immunoassays
- DNA analytics based on real time PCR

HSG-IMIT offers

- a systematic workflow for Lab-on-a-Chip Implementations (Lab-on-a-Chip Foundry Service)
- a prototyping workshop for manufacturing customer specific microfluidic chips;
- Lab-on-a-Chip research collaborations.



Diagnostic cartridge for DNA test in foil technology known from packaging industry

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