

# Lab-on-a-Chip Foundry Service – speeding up the miniaturization of *in vitro* diagnostics

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## Summary

We present the Lab-on-a-Chip Foundry Service of the HSG-IMIT that was founded to speed up the realization of *in vitro* diagnostic assays (IVD) as miniaturized microfluidic systems (Lab-on-a-Chip). The Lab-on-a-Chip Foundry Service opens the advantages of Lab-on-a-Chip - smaller consumption of reagents and faster turnaround times in compact, automated diagnostics - to a broad community. We offer everything from one hand: Layout, prototyping, fluidic and biochemical testing.

## Working principle

Implementation of an assay into the centrifugal microfluidic platform is achieved by a systematic workflow. The assay is divided into laboratory unit operations (LUO's). The LUO's are compiled into a layout of validated microfluidic structures (Fig. 1) according to given rules. A new layout is therefore built up by the concatenation of already existing and validated structures – a significant simplification of the design process. Our rapid prototyping workshop immediately realizes a functional prototype that is tested in our laboratories for fluidic and biochemical functionality. Prototypes are fabricated by technologies compatible to mass fabrication (Fig. 2).

## Centrifugal microfluidic platform

Centrifugal liquid handling is completely performed by the interplay between centrifugal and capillary forces. No expensive active valves are required and contact free dispensing avoids contamination of the devices. Based on the centrifugal platform we have demonstrated colorimetric absorption assays e.g for clinical chemistry but also immunoassays and Real-Time PCR assays.

## Conclusion

The Lab-on-a-Chip Foundry Service provides a novel and highly integrated service for the realization of *in vitro* diagnostic assays as compact and automated diagnostic systems. It speeds up the development process by a systematic workflow with all necessary resources available in one hand.

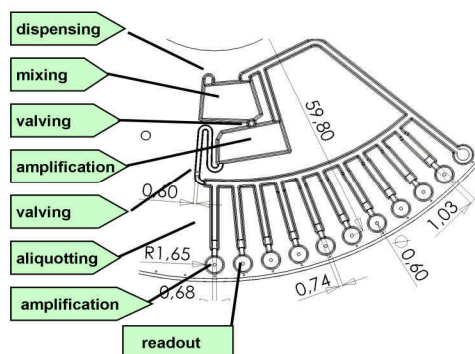


Fig. 1: Compilation of the schematic description of an assay into a microfluidic layout.

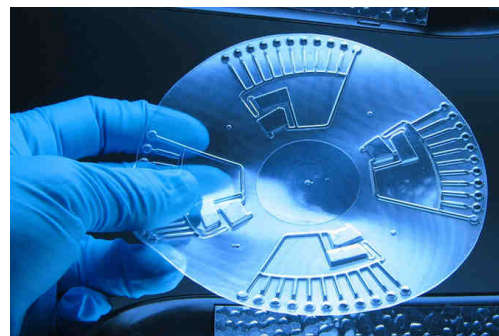


Fig. 2: Prototype of a centrifugal disk fabricated by thermoforming of foils.