

Lab-on-a-Disk

New modular platform for value added partner/reseller

The Bio-Disk platform integrates the entire process chain for mobile blood diagnostics. The heart of the platform is a rotating disk in Compact-Disk (CD) format featuring microfluidic channels and reaction chambers. The disk does not contain any active microcomponents such as pumps, valves or pipettes. All process steps and microfluidic operations are controlled by the spinning frequency of the disk. This includes

- liquid transport by centrifugal force
- flow control by capillary micro-valves
- metering and mixing structures
- blood separation by integrated centrifuge
- bead based parallel detection of
- disease specific proteins

We investigate two alternative approaches for biomolecular detection. The first one is based on the use of polymer beads. For every target molecule a certain type of bead is coated with the corresponding capture protein. A multitude of different types of beads are prepared for detection of a multitude of different biomolecules. We attach optically active quantum-dots with narrow spectral width to identify the different types of beads. Detection antibodies are attached to the beads before optical detection. All beads are arranged in a detection chamber as a monolayer for parallel read-out.

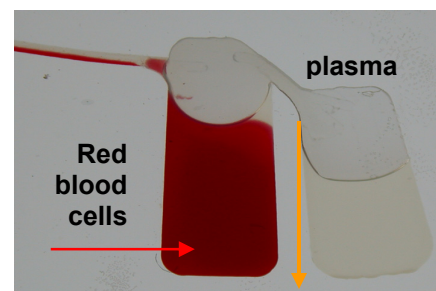
The second detection technique is specially suited to determine a set of important parameters in emergency care such as glucose, lactate and glutamine. These parameters are detected by a biosensitive layer immobilized on the channel wall. For more complex analysis of liver enzymes,

Bio-Disk Key Features

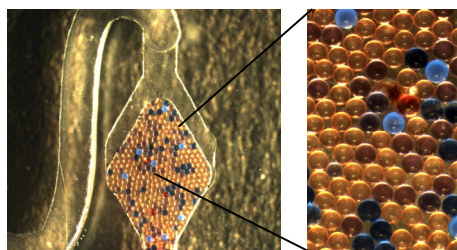
Bio-Disk	Rigid polymer disk comprising passive fluidic structures
	No active components
	Format adapted to conventional compact disks (CD)
Player	Complete process control via spinning drive
	Fluorescence readout of biochemical result
Beads	Capture proteins attached to the surface (solid phase for immuno-assay)
	Tagged to identify bead type, thus enables parallel assay formats



Bio-Disk placed on a player (concept)



Separation of plasma from whole blood



Bead-based detection by fluorescence readout (parallel assay format).

Potential applications

Detection of biochemical markers in parallel
Virus Disk
Emergency Disk
Physiology Disk

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ammonium and LDH-isoenzymes, the reagents are added and further washing steps are implemented on the Bio-Disk.

The Bio-Disk platform also provides a generic tool for almost any ligand based bioanalytical assay.

www.bio-disk.com