Visions to Products

LabDisk for clinical chemistry
Automated cholesterol analysis from blood

Easy handling and a fast time-to-result with as little human interaction as possible are the main requirements of Point-of-Care tests. Aim of this study is to demonstrate the integration of cholesterol quantification from a blood sample in a centrifugal microfluidic LabDisk, aiming at a sample volume of 40 µL, integrated sample preparation and a time-to-result of less than 7 minutes.

The layout of the LabDisk is depicted in figure 1 featuring the complete assay for cholesterol measurement. The sample of 40 µL can be obtained from a patient's finger prick blood drop as shown in figure 2. In a first step the blood plasma is separated from the hematocrit centrifugally. Enzymatic reagents are pre-stored in a cavity on the LabDisk which are rehydrated by contact with the separated plasma. While the reaction is starting, the analyte is transferred into integrated micro cuvettes. The kinetics of the enzymatic turbidimetric reaction is detected by a photometric readout device. Routing of the analyte is automated by the centrifugation speed and the microfluidic network.

A total time-to-result of 7 min allows for fast and accurate analysis and thus immediate and appropriate treatment.

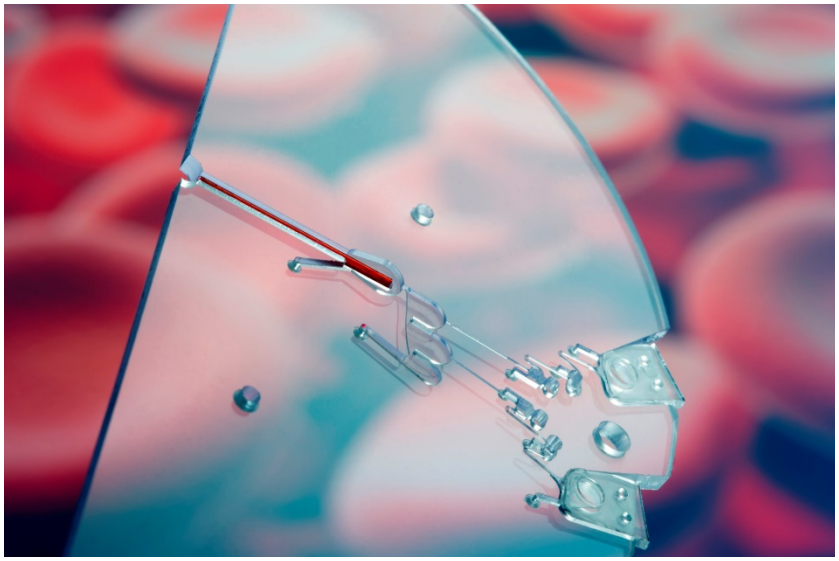

Fig. 1: Microfluidic LabDisk for automated analysis of cholesterol parameters from whole blood. The integrated capillary for direct blood sample uptake is marked in red, see also figure 2. Plasma separation, mixing with enzymatic reagents and transfer into the integrated microcuvettes for photometric read-out are fully automated and controlled ba the centrifugal protocol.

Key features

- Microfluidic automation of complete assay
- Sample uptake by an integrated end-to-end capillary
- Plasma separation from whole blood
- Rehydration of dry on-board stored enzymatic reagents
- Detection of cholesterol parameters via end-point absorption analysis
- Complete process control via centrifugal protocol
- Photometric readout using two wavelengths
- No active components

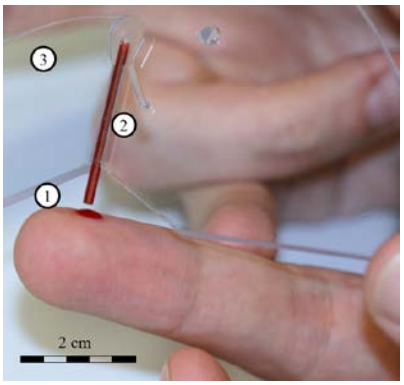

Fig. 2: A standard end-to-end capillary serves as interface for sample collection directly from the fingertip of a patient.

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