Fraunhofer IZI

Fraunhofer Institute for Cell Therapy and Immunology IZI

Molecular diagnostic chip

A device for an integrated nucleic acid amplification with an instrument-free readout

The demand for rapid molecular diagnostics at the point of need becomes more and more obvious nowadays. The applications span from the emergent epidemiological threats to the routine HomeCare needs, and the settings vary from a doctor's office to a patient's house, or even real field like remote villages in the developing countries. The MicroDiagnostics unit at the Fraunhofer IZI has developed a lab-on-a-chip device that can bring molecular diagnostics to any of these settings.

The chip integrates a reaction chamber with the dried reagents and a lateral flow strip for the detection of the amplified DNA. The temperature for isothermal DNA amplification is maintained by an external heating module; its format can be adapted for the actual need, starting from a simple heating block or a compact battery-driven device and ending with a battery-free chemical heating module.

Technology

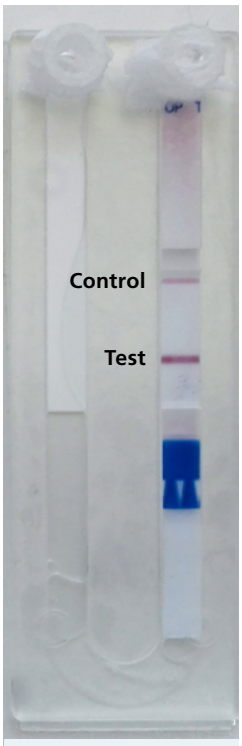
- Isothermal amplification of nucleic acids
- Freeze-dried reaction mix on board
- Simple lysis: lysis buffer is directly compatible with molecular amplification
- DNA and RNA detection is possible
- Instrument-free detection on integrated lateral flow strip
- Assay time ≈ 30 min

Applications

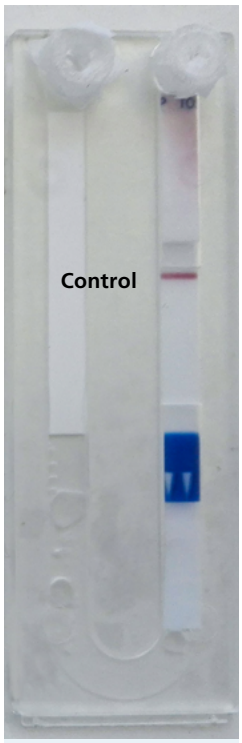
- Rapid diagnostics of infections
- Point-of-care diagnostics
- Screening programmes
- Mobile laboratories

Reference

Derrick TR, Sandetskaya N, Pickering H et al. **DjinniChip: evaluation of a novel molecular rapid diagnostic device for the detection of Chlamydia trachomatis in trachoma-endemic areas.** Parasites Vectors 13, 533 (2020). https://doi.org/10.1186/s13071-020-04414-6



Positive reaction



Negative reaction

Support

EUROPÄISCHE UNION
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SAB

Contact

Dr. Natalia Sandetskaya
Department of Diagnostics
MicroDiagnostics Unit
Tel. +49 341 35536-9310
natalia.sandetskaya@izi.fraunhofer.de

Fraunhofer Institute
for Cell Therapy and
Immunology
Perlickstraße 1
04103 Leipzig
Germany
www.izi.fraunhofer.de