

LabDisk for sample-to-answer detection of respiratory pathogens

Fully automated multiplex detection

Hahn-Schickard developed an integrated and fully automated LabDisk for the fast and reliable sample-to-answer diagnosis of highly infectious respiratory pathogens.

Respiratory tract infections are the fourth most common cause of death accounting for roughly 3.1 million deaths worldwide. Currently, pathogen detection is generally performed in central laboratories with turnaround times typically in the order of days. Due to the lack of fast diagnostics, antibiotics are often used upon suspicion with no effect on the course of the disease. Such unnecessary use of antibiotics is one of the leading reasons for the spread of multi-resistant pathogens, which have evolved to a major threat to global public health.

Our LabDisk enables sample-to-answer detection of 22 different pathogens at the point of care using a commercially available panel PCR assay, within 3.5 hours. The system was demonstrated for an H3N2 virus in a total of 18 LabDisks with sample concentrations down to 2.39×10^4 viral RNA copies per ml, which covers the range of clinical relevance.



Fig. 1: LabDisk player with LabDisk for detection of respiratory pathogens.

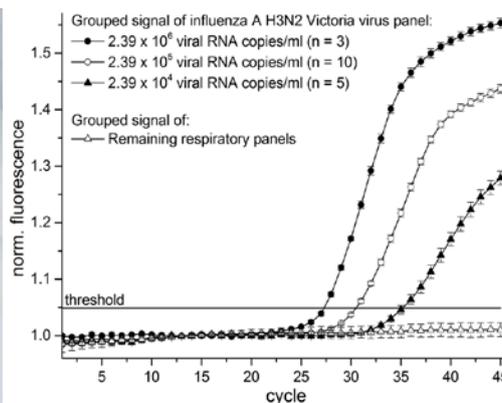


Fig. 2: Comparison of PCR results for Influenza A H3N2
Further reading: F. Stumpf et al., *Lab chip*, 2016, 16, 199-207

LabDisk – Characteristics

- Complete prestorage of all reagents
- Only one manual handling step: initial sample supply
- Fully automated sample-to-answer process including chemical lysis, RNA extraction and subsequent real-time RT-PCR
- Detection of 18 viruses and 4 bacteria which can cause respiratory tract infections
- Detection with clinical relevant sensitivity
- Ease of use for non-experts with minimal hands-on time

The LabDisks for sample-to-answer detection of respiratory pathogens can be processed in a portable and lightweight processing device, the “LabDisk player”. Furthermore, the device provides the possibility for thermocycling as well as

isothermal temperature control. With dimensions of 28 x 18 x 15 cm³ and a weight of only 2 kg, the LabDisk player is portable and perfectly meets the requirements for application at the point of care.