# New lab-on-a-chip platform seeks to improve pathogen detection

March 24 2017

Nuclear amplification testing is commonly used for pathogen detection; however, the process is currently manually intensive and complex, and requires dedicated equipment. This prevents its use in some settings, and pathogen detection in individual samples.

In a bid to solve these issues, Natalia Sandetskaya and colleagues at the Fraunhofer Institute for Cell Therapy & Immunology (Leipzig, Germany) have developed a prototype lab-on-a-chip platform capable of automating the process in a single instrument.

"We were motivated by the existing need for making the molecular analysis of complex samples much simpler for the users," commented Sandetskaya. "Our particular applied interest is the detection of the pathogens in blood; for instance in sepsis, when only a few microorganisms must be rapidly found in a large volume of blood."

The chip utilizes microfluidics and integrates sample volume transition, lysis, nucleic acid isolation, amplification (PCR or LAMP), and real-time fluorescence detection. As a single instrument, it could enable diagnostics in situations not previously feasible.

The researchers go on to demonstrate its proof-of-concept in the detection of *E. coli* and *Salmonella* bacterial species.

"Although our current prototype of the platform will need further development for this application, we have already demonstrated a high

level of integration of very diverse processes without making the system overly complex," noted Sandetskaya.

The team is now planning experiments to evaluate the platform in real-world samples and perfect its design.

The full article "An integrated versatile lab-on-a-chip platform for the isolation and nucleic acid-based detection of pathogens" is available open access at *Future Science OA*.

**More information:** Natalia Sandetskaya et al, An integrated versatile lab-on-a-chip platform for the isolation and nucleic acid-based detection of pathogens, *Future Science OA* (2017). DOI: 10.4155/fsoa-2016-0088

Provided by Future Science Group