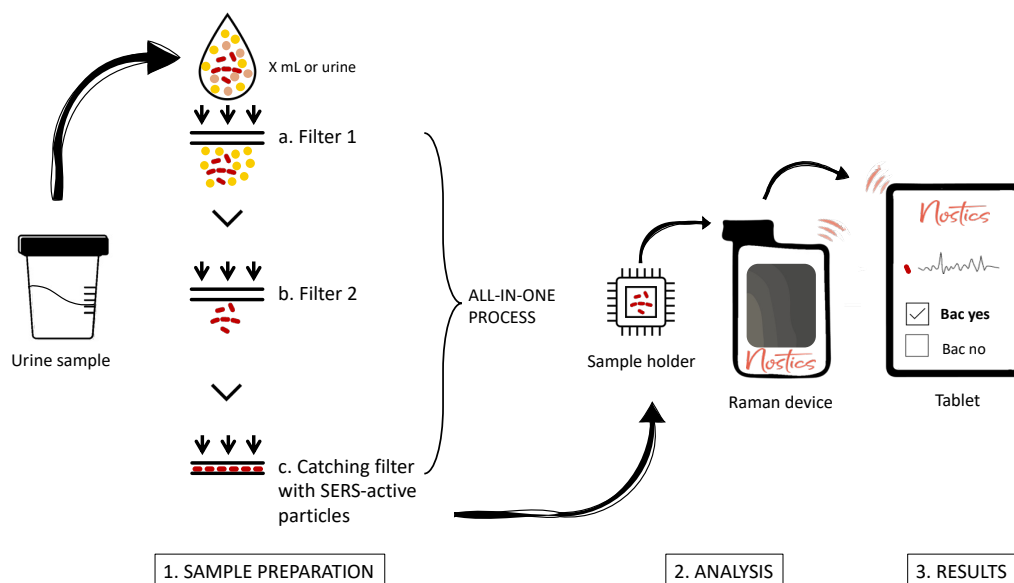


DUTI: a 15 min point-of-care test for direct urine tract infections identification

Nostics, Pietersbergweg 199, 1105 BM Amsterdam, The Netherlands



Urinary tract infections (UTIs) are currently the most common outpatient infections and one of the main sources of over-use and misuse of antibiotics, with an annual cost of about ~3 billion € only for antibiotics in Europe. Empirical treatment is often the easiest and most common solution for UTIs adopted by general practitioners (GPs) due to slow, ineffective or often absent point-of-care (PoC) diagnostic solutions. Consequently, high rate of inappropriate antibiotic prescriptions is observed, resulting in a significant rise in antimicrobial resistance (AMR) and healthcare costs.

Nostics is developing a PoC test, named DUTI, able to distinguish a bacterial UTIs directly from urine samples and in < 15 min. Nostics' technology is based on Raman spectroscopy, advanced nano-technology & Artificial Intelligence (AI), all combined in an easy-to-use, handheld device and cloud-software. The DUTI test combines the Nostics' technology with a filtration system to isolate bacteria present in the urine, allowing detection and identification of bacterium-specific spectra directly from clinical urine samples. The DUTI prototype has been first validated using urine from healthy donors and spiked with 5 bacterial species. Through a collaborative project with Dutch hospitals, a clinical validation is in progress whereby weekly batches of 10-20 clinical urine samples from patients are tested. Preliminary results have shown a DUTI performance of 93% in identifying positive and negative urine samples, confirming that through Nostics' sample preparation methods and technology it is possible to efficiently purify and detect 10 bacterial species directly from clinical urine samples, without the need of extra culture steps. Discrimination between Gram-positive and Gram-negative bacteria and identification of bacterial species is also in progress and a classifier for these applications is under development.

For the first time we have adapted a portable Raman spectroscopy device for diagnostic use, developing a fast and affordable PoC test able to identify bacterial UTIs directly from clinical urine samples. We believe this technology will make rapid diagnostics possible in the hands of GPs and healthcare staff, allowing prompt and more effective treatments, and ultimately reducing AMR.