Multianalytical Point-of-Care device for the diagnosis of viral infections

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Abstract

We propose a portable device with disposable cartridges for the diagnostic of Covid-19. The technology is based on magnetic sensors able to perform molecular and serologic tests in different cartridges. The device is composed of an electronic reader and disposable biochips with an array of magnetic sensors (Fig.1). Each biochip has 6 sensing sites for the interrogation of multiple target analytes (genes, antibodies, antigens), per sample. The use of magnetic markers coupled to on-chip magnetic attraction allow an increased sensitivity able to detect down to hundreds of target molecules per microliter of sample in shorter times [1,2]. The proposed technology has been validated for various clinical applications. Namely, in the detection of viral genes (Zika, Dengue and Chikungunya virus), bacteria [3], and serum protein biomarkers in ischemic stroke patients. Levels of sensitivity in the order of 10^-15 mol/L and ng/mL for nucleic acid hybridization and immunoassays, respectively, are reported. Major assets include, low cost (< 10€/test), multiplex (6 probes/test) and fast time to results (< 1 h).

REFERENCES

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FIGURES

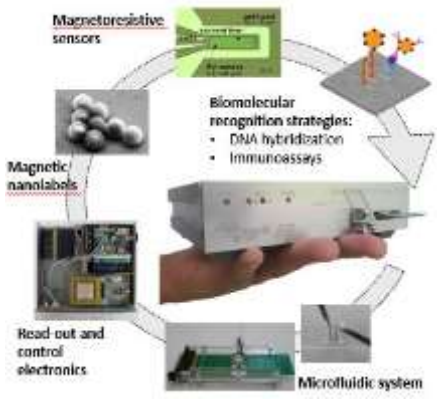

Figure 1: INESC MN portable diagnostic platform