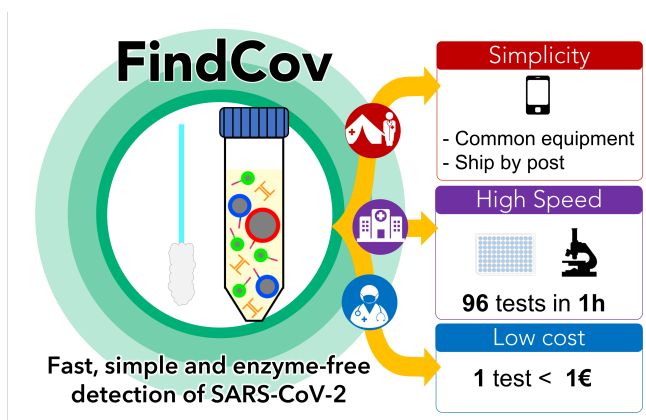


Fast, simple and enzyme-free detection of SARS-CoV-2

Presentation

The Covid19 pandemic has highlighted the crucial role of molecular diagnostics in understanding, predicting and controlling the progression of the virus. The polymerase chain reaction (PCR) is the gold standard for detecting the presence of viral RNA in a sample. However, although extremely sensitive, PCR suffers from several shortcomings which make it difficult to deploy on a large scale. It must be carried out by specialized personnel, on dedicated machines and in a centralized laboratory, which leads to the test result being communicated to the patient several hours or even days after the sample has been taken. In addition, PCR reagents (enzymes) are complex to produce and must be constantly refrigerated. In a context of global pandemic, the high tensions on the machines and the PCR kits make the supply chain uncertain, without counting the human needs in operators specialized in this type of tests.



In this project, we propose to develop a radically new way of detecting nucleic acid **without enzymes**. Inspired by immuno-assays (which do not have the luxury of chemical replicating their targets), **we propose to detect viral RNA by inducing the aggregation of micrometric fluorescent beads**. Using principles from DNA nanotechnology (to direct the folding of the viral RNA around the beads) as well as quantitative image processing, we aim to produce an quick but robust assay to prescreen patients potentially infected with Covid-19

Requirements:

We are looking for a postdoctoral candidate with a PhD in any relevant field (molecular biology, molecular diagnostics, DNA nanotechnology, beads based assays, immunoassays microfluidics...). The candidate should be familiar with some of the techniques involved (nucleic acids handling, beads-based assays, fluorescence microscopy, image analysis...)

The candidate will be hired by the French CNRS according to prevailing regulations, and based in Tokyo, in LIMMS, the joint research lab between CNRS and the Institute of Industrial Science. The duration of the employment will be 18 months, starting as soon as possible.

The candidate should prepare the following two documents:

1. **a cover letter detailing his/her motivation** for this position, his/her summary of past research as well as contact details of at least 2 academic referees
2. **a CV with a publication list**

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