Development and evaluation of simple, affordable, near-patient diagnostic tests for infectious diseases in the Philippines (AND²IDinPH)

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INTRODUCTION

Infectious diseases remain a major cause of morbidity and mortality in the Philippines. Patients may present with fever and a wide range of non-specific symptoms, which are difficult to diagnose without specialist laboratory tests

Current diagnostic tests that rely on culture of pathogens or detection of raised antibody titres can take days to weeks to provide actionable results, and are too slow to guide initial patient management. In the first week of infection, nucleic acid testing (NAT) is the most reliable method to identify the causative agent, but these are expensive and usually require well-resourced laboratories.

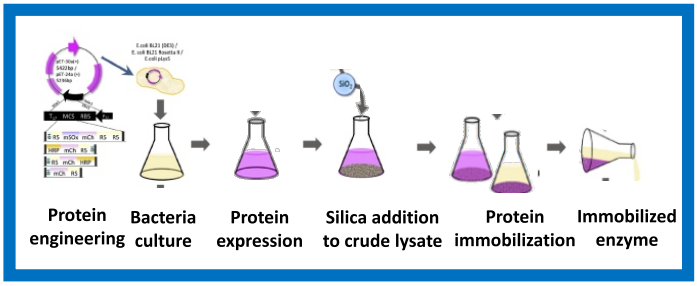
An NAT method suitable for low-resource settings is the loop-mediated isothermal amplification (LAMP) assay. It involves simple techniques, low-cost instrumentation and short analysis time. Its merits have been enhanced by the possibility of a employing pH-based detection.

The project aims to develop and evaluate simple, affordable, near-patient diagnostic tests for infectious diseases in the Philippines, that could be produced locally and be available at a low cost. The local production of expensive assay reagents, particularly the polymerase enzyme , and the local fabrication of a pH detection system will be innovated and subsequently validated using clinical samples.

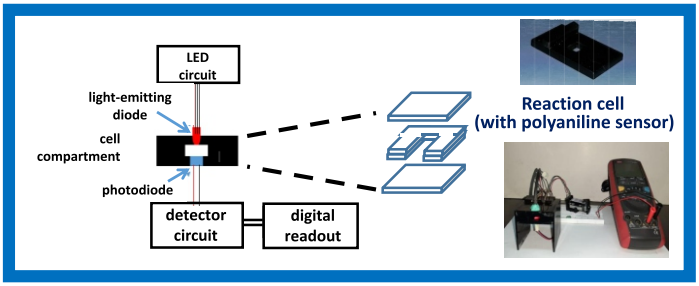
MILESTONES

The project initially proposed to focus on dengue, which is endemic in thr country and which had a high morbidity and mortality rate in 2018. However, due to the pandemic, hospital admission due to dengue has greatly decreased, causing problems in obtaining clinical samples for this project. As a result, covid-19 was included in the focus of the project.

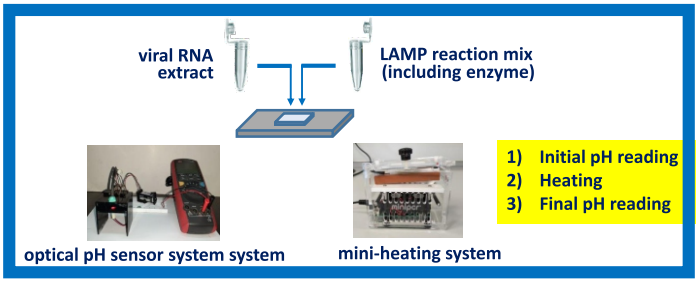
A. The local production of immobilized enzyme for LAMP assay has been demonstrated. (University of Cambridge)



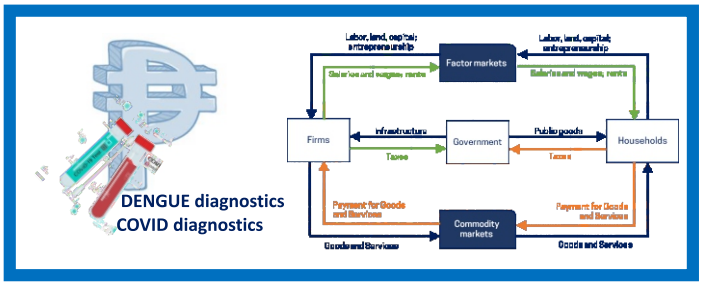
B. An optical pH sensor system for LAMP assay has been developed and its performance tested. (University of Santo Tomas)



C. A **provisional LAMP assay system has been assembled and tested using commercial assay reagents and control samples.** .



D. The impact of dengue and covid assay kits on health-care spending was analyzed using a computable general equilibrium (CGE) model.



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