Poster

Development of a novel and rapid molecular diagnostic system for Hepatitis C virus (HCV) detection

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Keywords: HCV; RT-LAMP; POC diagnosis

ABSTRACT

Hepatitis C virus (HCV) is an enveloped, single-stranded positive sense RNA [ssRNA(+)] virus which causes cirrhosis, hepatocellular carcinoma and liver failure in infected patients [1]. The Global Hepatitis Report posted in 2017, indicates that around 71 million people were living with HCV in 2015 [2]. Moreover, the most recent data collected in 2019 by WHO was able to estimate that 58 million people live with chronic hepatitis C infection and about 1.5 million new infections occur per year. Due to the increasing number of infections, one of the recommendations postulated in the 2022 guidelines ("Updated recommendations on HCV simplified service delivery and HCV diagnostics: policy brief") was to achieve more efficient and simplified hepatitis diagnosis [3]. The diagnosis of an active HCV infection requieres the detection of HCV RNA, and nowadays it is performed by the gold standard real-time reverse transcription polymerase chain reaction (RT-qPCR). Nevertheless, it involves specific laboratory facilities, well-trained personnel and high-cost equipment, maintenance and reagents [4]. Consequently, this project was born on the need of developing a new diagnostic system for direct HCV molecular detection based on the RT-LAMP (reverse transcription loop-mediated isothermal amplification) technique that could be implemented in resource-limited settings. This strategy is focused on the nucleic acid-based amplification method using from four to six primers under isothermal conditions to amplify specifically and effectively the target sequence [4]. The aim of the project is to validate the system and integrate it in a future point-of-care (POC) diagnostic device.

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