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Simple and highly rapid molecular diagnosis of SFTS virus using reverse transcriptional loop-mediated isothermal amplification (RT-LAMP)

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Severe Fever With Thrombocytopenia Syndrome (SFTS), a member of *Bunyaviridae*, is characterized by gastrointestinal symptoms, chills, joint pain, myalgia, thrombocytopenia, leukocytopenia and some hemorrhagic manifestations with a case fatality rate of about 2 to 15%. Since vaccine or antiviral drugs are currently unavailable, the use of a simple and sensitive reverse transcription-loop mediated isothermal amplification for early and rapid detection is critical for prevention and control of the infection. Specific primers were designed to target the L gene of SFTSV. The analytical sensitivity and specificity of the RT-LAMP assay which is based on colorimetric visualization for detection were compared with conventional RT-PCR and quantitative real-time PCR. The detection limit of the RT-LAMP assay was approximately 10^0 infectious viral genome copies of SFTSV and exhibited 97% agreement compared to real-time RT-PCR and more sensitive than conventional RT-PCR, with a rapid detection time of 20 min. Moreover, no cross-reactive amplification of *Entero viruses* and *Zika virus* which are known to cause similar clinical manifestations as well as *Influenza* and *MERS-CoV* viruses was observed. The assay was further evaluated using 9 specimens from clinically suspected SFTS and 1 laboratory-proven virus infection with fever syndrome patients. The highly sensitive and rapid visualization using RT-LAMP method is feasible for SFTSV field diagnosis in resource-limited field settings.

Biography

Yunhee Baek is currently pursuing PhD at the College of Medicine and Medical Research Institute at the Chungbuk National University, South Korea and has published various research works on human and animal influenza virus studies ranging from epidemiology, genetic evolution, vaccine efficacies and host-pathogen protein interactions in various scientific journals.

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