Biomedical Engineering Seminar Series

1st Semester, Academic Year 2018

Date: November 27, 2018
Time: 10.00 AM – 11.00 AM
Room 6373, 3rd level, Building 3,
Faculty of Engineering; Mahidol University

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"ON-SITE LAMP-BASED DETECTION PLATFORMS FOR MEDICAL DIAGNOSTICS"

An accelerated, loop-mediated isothermal amplification (LAMP) assay has been developed for sensitive and specific detection of few copies of target nucleic acids of pathogens. It operates under isothermal conditions by self-recurring strand-displacement DNA synthesis using specially designed primer sets. Since LAMP does not require sophisticated equipment, it is more applicable for small or on-site laboratories. Here, the rapid assay platforms for on-site detection by combining LAMP and use of a portable turbidimeter, lateral flow dipsticks, oligonucleotide-labeled nanogold probes, and electrochemical biosensor will be presented. The time required for these integrated LAMP techniques is approximately 60-90 min. These methods have been successfully applied for detection of human infectious diseases, e.g., Mycobacterium tuberculosis, malaria (Plasmodium facipalum, Plasmodium vivax), human papillomavirus, Hepatitis B virus and methicillin-resistant Staphylococcus aureus. These integrated LAMP techniques are sensitive, simple, rapid, cost-effective and can be manufactured locally, reducing the need for imported diagnostic kits. They can be applied in routine diagnosis and progressed into a realistic point of care detections for use in treatment and control of infectious diseases for resource-poor endemic areas.

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