Title: Development of Microfluidic Paper-Based Analytical Devices for Affordable Point-of-Care Diagnostics

Date/ time: 31 July 2020/ 9:00 AM-11:00 AM, How: due to covid-19 pandemic, the seminar will be organized online using Microsoft Teams.

Who should attend?
Researchers, academic staffs, M. Sc./M. Eng. students and other senior students are recommended to attend. Interested person (RUPPer or non-RUPPer) can access the Google Form via the URL below for FREE registration BEFORE 27 July 2020.
https://docs.google.com/forms/d/e/1FAlpQLsDPY7DXYYnbFy7PLL6sU1JKcW2xEZANNkui812W34y9ZI/HdG/vi

Speaker: Veasna Soum, PhD in Chemistry, Moderator: Dr. Sunly Khimphun (Dr. Veasna Soum has successfully defended his PhD dissertation at the Dept. of Chemistry, Sogang Univ., Seoul, Korea, and will attend the official graduation ceremony in August 2020. He has authored and co-authored several papers in renown scientific journals. See attached CV or google him for his publications!)

Join us...to learn and share scientific knowledge!
Development of Microfluidic Paper-based Analytical Devices for Affordable Point-of-care Diagnostics

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Abstract

Microfluidic paper-based analytical devices (μPADs) have become promising tools offering various analytical applications for chemical, biological and diagnostic assays, especially as point-of-care (POC) testing devices. Development of μPADs provides better engineering of POC sensing and testing devices for reducing fabrication cost, increasing detection sensitivity, realizing a wild range of assay protocols and to the end promising toward high-throughput diagnostic screening devices. Herein, after we massively reviewed developments of μPADs especially for POC devices, we showed our own novel methods for fabrication of the comprehensive paper-based lab-on-a chips (LOCs) equipped with biosensors: electrochemical sensors (ECSs) and colorimetric sensors, and paper-based microfluidic devices: paper-based continuous-flow microfluidic devices (p-CMFs) and paper-based digital microfluidic devices (p-DMFs). The fabricated biosensors were successfully used to detect various diagnostic analytes such as glucose and methyl paraoxon (MPO) that are the critical clinical indicators for diabetes and nerve agent simulant, respectively. The fabricated microfluidic devices were used to handle fluid samples in programmable way and capable for usages of a wide range of analytical assay protocols both single-step and multiple-step assay. Our approaches opened an avenue for affordable μPADs for POC testing for medical screening especially for resource-limited settings.

Keywords: microfluidic paper-based analytical devices; immunoassay; biomarkers; continuous-flow microfluidic device; digital microfluidic device; printing of nanomaterial ink; lab-on-a-chip
Graphical abstract:
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EDUCATION

PhD  Sogang University, Chemistry  August 2020
MS   Sogang University, Chemistry  February 2017
BS   Royal University of Phnom Penh, Biochemistry  July 2013

HONORS AND AWARDS

1. The Chemistry Award for Outstanding Graduate Student, Graduate student of Sogang University, 2018.

2. Best Poster Award of The International Conference on Flexible and Printed Electronics, Conference poster presentation, 2017.

3. The DOW Chemical-Sogang Award for Outstanding Graduate Student, Master graduation thesis, 2016.

RESEARCH INTERESTS

1. Nanomaterial deposition by printing methods: Fabrication of paper-based electrochemical sensor/ Applied for detection of glucose that is indicator for diabetes diagnosis/ Low cost


4. Surface coating of high temperature stable polymer: Heat stable and glossy surface paper substrate for printing nanomaterial ink/ For printed flexible electronics

PUBLICATIONS

Journal Publications


PATENTS


PRESENTATIONS AND INVITED LECTURES
