

NOVEL NANO-MICRO TECHNOLOGY-BASED SENSING APPROACHES FOR DIAGNOSTIC APPLICATION

From lateral flow devices to microfluidics assay

2 – 5 July 2018 | INFORMMM, USM Main Campus, Penang

Course Description

This hands-on course contains two components, lectures and hands-on. The first part of lectures is designed to establish a solid foundation on lateral flow technology which includes labelling, antibody selection, next generation lateral flow assay, gold nano-particles conjugation and reader for lateral flow assay. Whilst the second part of the lectures on microfluidics includes introduction to microfluidics behaviour for biosensor technology, fabrication and characterization of microfluidics microelectromechanical (MEM) technology for lab chip device, utilization of rapid biosensors for pathogen and toxin detection and next generation nucleic acid and protein biosensors. The second component is hands-on laboratory session with the experts with special highlight on crucial preparation steps in lateral flow – dispensing, laminating and cutting and demonstration of basic microfluidic system with sensor detection. The integrated learning methods and hands-on training to reinforce lecture materials will allow participants to apply the techniques from this course in their own research.

Objectives

- To provide the participants an intensive theoretical aspects on development of lateral flow and microfluidics for biosensors.
- To provide the participants thorough hands-on experience on lateral flow and microfluidics for biosensors.
- To provide the participants with the hands-on experience on optical sensor detection system.

Speakers

1. **Prof Dr Rahmah Noordin**
INFORMMM, USM
2. **Prof Dr Mohd Adzir Mahdi**
Faculty of Engineering, UPM
3. **Prof Dr Mohammed Zourob**
Alfaisal University, Riyadh, KSA
4. **Assoc Prof Dr Asrulnizam Abd Manaf**
CEDEC, USM
5. **Assoc Prof Dr Aziah Ismail**
INFORMMM, USM
6. **Dr Klaus Hochleitner**
Global Lead GE Healthcare
7. **Dr WarrickSu**
Zensor R&D Co., Taiwan
8. **Dr Yazmin Bustami**
School of Biological Sciences, USM
9. **Dr Srung Smanmoo**
National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand
10. **Anthony V. Lemmo**
Chief Operation Officer, BioDot Inc., US
11. **Cornelia Haenel**
Qiagen, Germany

Registration

Registration Deadline
25th June 2018

A 4-Day Workshop | RM 755

Seat Limit
25 participants

Contact

Registration and Enquiries

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Click to Register

This hands-on course is organised by the Institute for Research in Molecular Medicine (INFORMMM), Universiti Sains Malaysia in collaboration with Collaborative Microelectronic Design Excellence Centre (CEDEC), Universiti Sains Malaysia



MyCPD points for USM staff.

Tentative programme of the Workshop

Time	Day 1: Lateral flow assay	Speaker
0830-0845	Welcome remarks	Aziah Ismail
0845-0915	Introduction to lateral flow assay	Aziah Ismail
0915-1000	Labels, antibody selection and next generation lateral flow assay	Klaus Hochleitner
1000-1030	Tea break	
1030-1115	Backing basics for lateral flow assay	Klaus Hochleitner
1115-1200	Gold nano-particles conjugation	Klaus Hochleitner
1200-1245	Application of reader for lateral flow assay	Cornelia Haenel
1240-1400	Lunch	
1400-1445	How to convert colorimetric lateral flow assay to digital device	Warrick Su
1445-1530	Application of lateral flow technology for parasitic disease rapid diagnostics	Rahmah Noordin
1530-1600	Tea break	
1600-1730	Hands-on: Dispensing, laminating and cutting lateral flow components	INFORMMM lab staff

Time	Day 2: Recognition receptors in biosensors	Speaker
0845-0930	Introduction to recognition receptors	Zourob
0930-1015	Different methods of immobilization of recognition receptors	Zourob
1015-1045	Tea break	
1045-1130	Aptamers, MIPS and others	Zourob
1130-1215	Commercialization of biosensor-based diagnostics	Warrick Su
1215-1300	Commercial Talk by Zensor R&D Co.	Warrick Su
1300-1400	Lunch	
1400-1600	Hands on:Free assays using aptamer: Molecular beacon & strand displacement	Zourob
1600-1630	Tea break	
1630-1800	Hands on: Aptamer characterization after SELEX	Zourob

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Time	Day 3 : Optical Biosensors	Speaker
0845-0930	Introduction to optical sensors	Zourob
0930-1015	The different types of optical sensors; evanescent field based sensors	Zourob
1015-1045	Tea break	
1045-1130	The different types of optical sensors: fluorescence, chemiluminescence & absorbance	Zourob
1130-1215	Applications of the optical sensors	Zourob
1215-1300	Lab-on-fiber biophotonic sensors	Adzir Mahdi
1300-1400	Lunch	
1400-1600	Hands on: SPR in optical-based biosensor: fluorescence & absorbance	Zourob/ Mervyn/ Chua
1600-1630	Tea break	
1630-1800	Hands on: Demonstration on glucose detection using magnetic-gold nanoparticles: An application of optical sensor	Yazmin Bustami

Time	Day 4 : Electrochemical biosensors integrated with micro fluidic technology	Speaker
0830-0910	Introduction to Electrochemical sensor principle	Asrulnizam Abd Manaf
0910-0950	Implementation on 2 and 3 electrodes based sensor (CE, WE, RE)	Asrulnizam Abd Manaf
0950-1030	Characterization on EC sensor based on CV technique, resolution and sensitivity Sensing mechanism on IDE electrode structure	Asrulnizam Abd Manaf
1030-1100	Tea break	
1100-1140	Fabrication and characterisation of micro fluidic MEMS technology for lab on chip device	Asrulnizam Abd Manaf
1140-1230	An integrated and rapid biosensors for pathogens and Protein Biosensors	Asrulnizam Abd Manaf
1230-1310	Biosensor for narcotic drug	Srung Smanmoo
1310-1400	Lunch	
1400-1440	BioDot system for lateral flow assay and biosensor application	Anthony V. Lemmo
1440-1600	Hands on: Demonstration on EC detection with Cyclic voltanmetric technique	Asrulnizam Abd Manaf
1600-1630	Tea break	
1630-1800	Hands on: Demonstration of basic microfluidic system with sensor detection	Asrulnizam Abd Manaf

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