

Miss Nongluck Houngkamhang, Ph.D.

น.ส.นงลักษณ์ หวงกำแพง

Work address:

College of Nanotechnology,
King Mongkut's Institute of Technology Ladkrabang
(KMITL)
Chalongkrung Road, Ladkrabang,
Bangkok 10520, Thailand
mobile: +66 86 349 5570

สถานที่ทำงาน :

วิทยาลัยนาโนเทคโนโลยีพระจอมเกล้าลาดกระบัง
สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง
ถ.ฉลองกรุง เขตลาดกระบัง
กรุงเทพ 10520
e-mail: nongluck.hkh@gmail.com

Work experience:

Jan 2014 – present, Lecturer, College of Nanotechnology, KMITL, Thailand
Nov 2012 – 2013, Research Associate for the project on "Development of Triple Test for Down Syndrome in Pregnant Woman". The joint project between NECTEC, Rachanukul Hospital and Center of Intelligent Materials and System, Mahidol University.

Educations:

2007-Nov 2012, Ph.D. student, Materials Science and Engineering Program, Faculty of Science, Mahidol University, Thailand
Thesis Title: Antibody Platform for Microalbumin Detection and ABO Blood Typing by Antibodies Arrays Based Surface Plasmon Resonance Imaging

Aug 2011-Feb 2012, Research stay at Chemistry and Physics of Interfaces (CPI), Department of Microsystems Engineering, University of Freiburg – IMTEK, Germany.

2003-2006, BSc (Second Class Honor) (Chemistry), Naresuan University, Thailand,
Thesis Title: Influences of Chain Conformation and Chemical Structure on Photoemission Behaviors of Conjugated Polymers

Research experience:

Part 1: Development of Microalbumin Detection by SPR technique (Ph.D. thesis)

Developing an antibody platform for microalbumin detection by SPR technique. Various combinations of capture antibody and signal enhanced antibody on the mixed self assembly monolayer (mSAM) and carboxymethyl dextran (CMD) surface were optimized. The most suitable platform which provides high specificity and sensitivity was selected for microalbumin sensor surface. The result from the SPR technique was quantitatively consistent with a standard turbidimetric method.

Part 2: Development of ABO Blood Typing Based on Protein Array Technique (Ph.D. thesis)

Developing the SPR imaging technique for ABO-Rh blood typing including the detection of A, B and D antigen on red blood cell surface and antibody in serum. The new approaches for blood typing based on protein array technology were successfully demonstrated. The technique allows an easy and simple method for ABO-Rh blood typing by simultaneous forward cell grouping, reverse serum grouping and Rh (D) typing can be observed on a single run using whole blood sample. This project was collaboration with Blood Bank, Ramathibodi Hospital.

Part 3: Research stay at Chemistry and Physics of Interfaces (CPI), Department of Microsystems Engineering, University of Freiburg – IMTEK, Germany.

The research involved with development of the DNA biochip for a single step of PCR and hybridization of staphylococcus aureus DNA on the lid of microtiter plate. Using micro printing technology to fabricate the DNA array probe on thermoplastic substrate and tested for their hybridization with the specific DNA target.

Research interest: protein chips, surface chemistry, development of medical diagnostic device and kits

Scholarship:

- 2003-2006, Human Resource Development in Science Project (Science Achievement Scholarship of Thailand, SAST)
- 2007-2012 The Royal Golden Jubilee Ph.D. Program (The Thailand Research Fund)

Publication:

- (1) **N. Hougkhang**, A. Vongsakulyanon, P. Peungthum, K. Sudprasert, P. Kitpoka, M. Kunakorn, B. Sutapun, R. Amarit, A. Somboonkaew, and T. Sriksirin, *ABO Blood-Typing Using an Antibody Array Technique Based on Surface Plasmon Resonance Imaging*, *Sensors* 13 (2013) 11913-11922.
- (2) C. Puttharugsa, T. Wangkam, **N. Hougkhang**, S. Yodmongkol, O. Gajanandana, O. Himananto, B. Sutapun, R. Amarit, A. Somboonkaew, T. Sriksirin, *A polymer surface for antibody detection by using surface plasmon resonance via immobilized antigen*, *Current Applied Physics* 13 (2013) 1008-1013
- (3) C. Puttharugsa, T. Wangkam, **N. Hougkhang**, O. Gajanandana, O. Himananto, B. Sutapun, R. Amarit, A. Somboonkaew, T. Sriksirin, *Development of surface Plasmon resonance imaging for detection of *Acidovorax avenae* subsp. *citrulli* (Aac) using specific monoclonal antibody*, *Biosensors and Bioelectronics* 26 (2011) 2341–2346.
- (4) B. Sutapun, A. Somboonkaew, R. Amrit, **N. Hougkhang**, T. Sriksirin, *A multichannel surface plasmon resonance sensor using a new spectral readout system without moving optics*, *Sensors and Actuators B* 156 (2011) 312-318.
- (5) **N. Hougkhang**, C. Puttharugsa, T. Wangkam, A. Vongsakulyanon, M. Kunakorn, B. Sutapun, R. Amarit, A. Somboonkaew and T. Sriksirin, *The Detection of Human Serum Albumin (HSA) by Surface Plasmon Resonance (SPR) on The Mixed Self-Assemble Monolayer (mSAM) and Carboxymethyl-dextran (CMD) Surfaces*. (to be submitted)

Patent:

- (1) A Thailand patent (patent application number 1301000757) is under consideration
เซนเซอร์ชิพเอสพีอาร์แบบอาร์เรย์สำหรับกรจําแนกหมู่เลือดชนิดเอบีโอ (SPR Array Sensor Chip for ABO Blood Typing) (เลขที่คำขอ 1301000757 ; 15 กุมภาพันธ์ 2556)

The invention relates to antibodies array sensor. For the classification of A, B, AB or O blood group (ABO blood typing system) by using surface plasmon resonance imaging (SPR imaging) technique. The results showed high accuracy and can be regenerated at least 20 cycles. This invention can be further developed as a tool for the automatic classification of blood.

Thesis advisor and co-advisor:

- (1) Asst.Prof.Dr.Toemsak Sriksirin (Thesis Advisor)
Department of physics, Faculty of Science, Mahidol University.
- (2) Dr.Boonsong Sutapun (Thesis Co-Advisor)
School of Electronic Engineering and School of Telecommunications Engineering,
Suranaree University of Technology,
- (3) Assoc. Prof.Dr. Mongkol Kunakorn (MD) (Thesis Co-Advisor)
Department of Pathology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University
- (4) Asst.Prof.Pimpan Kitpoka (MD) (Thesis Co-Advisor)
Blood Bank Division, Department of Pathology, Faculty of Medicine, Ramathibodi Hospital,
Mahidol University
- (5) Prof. Juergen Ruehe, (Thesis committee, Co-advisor on research stay at IMTEK, Germany)
Chemistry and Physics of Interfaces, Department of Microsystems Engineering,
University of Freiburg – IMTEK, Germany

Reference:

Asst.Prof.Dr. Toemsak Sriksirin
Department of Physics, Faculty of Science, Mahidol University, Thailand.
Email: toemsak.sri@mahidol.ac.th, Tel: +66 2 201 5855, +66 81 611 1626