

# INBIOSIS SEMINAR SERIES (15)



## LC-MS Based Metabolite Profiling for Biomarker Discovery and Systems Biology Research

by

**Dr. Habtom W. Resson**  
Georgetown University Medical Center

**17 December 2010 (Friday)**

**9.00 am ~ 10.30 am**

**Seminar Hall**  
**Institute of Systems Biology (INBIOSIS)**  
**Universiti Kebangsaan Malaysia**



### **TENTATIVE SCHEDULE**

**17/12/2010 (Friday)**

**8:30 am – 8:45 am**  
*Registration*

**8:45 am – 9:00 am**  
*Welcome Speech*

**9:00 am – 10:15 am**  
*Seminar : LC-MS Based Metabolite Profiling for Biomarker  
Discovery and Systems Biology Research*

**10:15 am – 10:30 am**  
*Conclusion, Q&A and Wrap-up  
Coffee break*



## **Dr. Habtom W. Resson**

**Associate Professor, Department of Oncology  
Lombardi Comprehensive Cancer Center  
Georgetown University Medical Center**

Dr. Resson received a Ph.D. in Electrical Engineering from the University of Kaiserslautern, Germany in 1999. Prior to joining Georgetown University in 2004, he was an Assistant Professor of Electrical and Computer Engineering at the University of Maine, where he applied computational intelligence-based methods such as artificial neural networks, fuzzy logic, and evolutionary computing for microarray gene expression data analysis, DNA base calling, ocean color remote sensing, and industrial process control. Currently, he is an Associate Professor in the Department of Oncology at Lombardi Comprehensive Cancer Center, Georgetown University Medical Center. His research focuses on cancer biomarker discovery and systems biology by analysis of omics data. Specifically, he uses label-free liquid chromatography-mass spectrometry (LC-MS) methods to find candidate peptide, glycan, and metabolic biomarkers in human biofluids. His laboratory develops advanced signal processing, statistical, and machine learning methods to analyze LC-MS data and to integrate omics data for biomarker discovery and systems biology research. Dr. Resson's laboratory is funded by grants from the National Science Foundation and the National Institutes of Health. He is a senior member of the Institute of Electrical and Electronics Engineers (IEEE) and a Director of the Lombardi Comprehensive Cancer Center's Genomics and Epigenomics Shared Resource, which provides services for various studies including DNA sequencing, fragment analysis, gene expression, microRNA, methylation, and SNP genotyping.

## **Abstract**

### **LC-MS Based Metabolite Profiling for Biomarker Discovery and Systems Biology Research**

Metabolomics is the comprehensive analysis of small molecule metabolites produced by normal or abnormal cellular processes. It is fast gaining ground as a powerful tool for biomarker discovery and as an important component of systems biology research, complementing genomics, transcriptomics, and proteomics. Recent advances in LC-MS based metabolomics have created the potential to measure the levels of numerous metabolites in various media ranging from cell cultures to human biological fluids such as urine, saliva, and blood. This talk will give an overview on the following specific topics: (1) untargeted metabolomic profiling by label-free LC-MS methods to find candidate metabolic biomarkers for early detection of complex disease such as cancer; (2) identification of metabolites by database search and spectral matching; (3) verification of candidate metabolic biomarkers by absolute quantitation using multiple reaction monitoring (MRM) assays; and (4) integration of biomarkers identified by various omics methods for systems biology research. An example will be provided from an ongoing cancer biomarker discovery study, in which LC-MS data are generated from hundreds of serum samples collected at Georgetown University Hospital. In addition, the talk will present data processing, statistical, and machine learning methods applied for LC-MS data filtering, peak finding, alignment, normalization, visualization, identification of significant features, metabolite identification, functional interpretation, and pathway analysis.

## Registration Form (INBIOSIS Seminar Series 15)

Name : \_\_\_\_\_  
Institution : \_\_\_\_\_  
Address : \_\_\_\_\_  
Tel No. : \_\_\_\_\_  
Fax No. : \_\_\_\_\_  
Email : \_\_\_\_\_

Attendance confirmation should be made before **16 December 2010 (Thursday)** and sent to  
Institute of Systems Biology  
Universiti Kebangsaan Malaysia  
43600 UKM Bangi or  
faxed to **03-8921 3398**

*\*As places are limited, early registration is recommended.*

### Enquires

For more information please contact:  
03 8921 4558 / 03 8921 4549  
(Nur Hasrina Mohar / Emelda Rooseleena Rohani / General)  
Or email:

inbiosis.seminar.series@gmail.com / rina@ukm.my/ emelda@ukm.my

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