

## ACTIVITY REPORT

### The 11<sup>th</sup> AEARU Workshop on Molecular Biology and Biotechnology “Physical Biology”

December 21 – 22, 2011

The Hong Kong University of Science and Technology, Hong Kong

Organized by HKUST

#### Overview

The 11<sup>th</sup> AEARU Workshop on Molecular Biology and Biotechnology was successfully held on 21<sup>st</sup> to 22<sup>nd</sup> of December. The Workshop was well attended by over 100 faculty members, postdoctoral and postgraduate students. There were participants and speakers from China, Taiwan, Singapore, Korea, Japan, U.S. and Europe, as well as from other local tertiary institutions. There was a very full program of over 24 talks and Plenary Lectures, as well as over 25 posters. All the talks were well attended with a lot of discussions, as well as a very lively closing discussion by the session chairs and plenary speakers. Overall seven AEARU Travel Awards and four AEARU Poster Awards were granted to students. There were a lot of exchanges throughout the Workshop.

The theme of the Workshop was “Physical Biology” and there were three themes, Physical Biology of Cells and Biopolymers, Physical Biology of Biomechanics and Physical Biology of Microfluidics. For details please see the accompanied program.

## Organizing Committee

Co-Chair:	Prof. Joseph T.Y. WONG	Division of Life Science, HKUST
and	Prof. Weijia WEN	Department of Physics, HKUST
	Prof. Karl W.K. TSIM	Division of Life Science, HKUST
	Prof. Yung Hou WONG	Division of Life Science, HKUST
	Prof. Nancy Y. IP	Division of Life Science, HKUST
	Prof. Tai Kai NG	Department of Physics, HKUST
	Prof. I-Ming HSING	Division of Biomedical Engineering, HKUST

## Scientific Committee

Prof. Joseph T.Y. WONG	Division of Life Science, HKUST
Prof. Weijia WEN	Department of Physics, HKUST
Prof. Kunio TAKEYASU	Kyoto University
Prof. Atsushi IKAI	Tokyo Institute of Technology



Workshop Photo on 21st Dec 2011

# The 11<sup>th</sup> AEARU Workshop on Molecular Biology and Biotechnology

## “Physical Biology”

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### SCIENTIFIC PROGRAM

#### December 21, 2011 (Wednesday)

09:00 Registration start  
09:15 - 09:30 Opening Remarks

#### PLENARY LECTURE

Co-Chairs: Joseph T. Y. WONG and Weijia WEN

09:30 - 10:30 **[PL-1]** Robert H. AUSTIN  
Princeton University, USA  
HKUST Institute for Advanced Study  
**Applications of Microfluidics in Fundamentals of Cancer Dynamics**

10:30 - 10:45 Coffee Break

#### SESSION 1: Physical Biology of Cells and Biopolymers I

Co-Chairs: Kunio TAKEYASU and Je-Kyun PARK

10:45 – 11:15 **[1.1]** Atsushi IKAI  
Tokyo Institute of Technology, Japan  
**Biomechanics of Cytoskeletal Structures**

11:15 – 11:45 **[1.2]** Xuhui HUANG  
Hong Kong University of Science and Technology, Hong Kong  
**Investigating Conformational Changes during Gene Transcription using Markov State Models**

11:45 – 12:15 **[1.3]** Jie YAN  
National University of Singapore, Singapore  
**Rigid Nucleoprotein Filaments Formed by Bacterial H-NS-like Proteins and Their Relevance to H-NS Mediated Gene-silencing**

12:15 – 12:45 **[1.4]** Yanxiang ZHAO  
Hong Kong Polytechnic University, Hong Kong  
**Increased Structural Flexibility at the Active Site of a Fluorophore-conjugated  $\beta$ -**

## Lactamase

12:45 - 14:00 Photo and Lunch

## PLENARY LECTURE

Co-Chairs: Joseph T. Y. WONG and Weijia WEN

14:00 - 15:00 [PL-2] Mingjie ZHANG  
Hong Kong University of Science and Technology, Hong Kong  
**Structures of Usher Syndrome 1 Proteins and Their Complexes**

## SESSION 1: Physical Biology of Cells and Biopolymers I

Co-Chairs: Kunio TAKEYASU and Je-Kyun PARK

15:00 – 15:30 [1.5] Kunio TAKEYASU  
Kyoto University, Japan  
**Protein Structure and Function Revealed by Force Spectroscopy**

15:30 – 16:00 [1.6] Penger TONG  
Hong Kong University of Science and Technology, Hong Kong  
**Lateral Motion of Proteins and Lipids on Live Cell Membrane**

16:00 – 16:30 [1.7] Jennifer Hyunjong SHIN  
Korea Advanced Institute of Science and Technology, Korea  
**Physical Regulation of Stem Cells**

16:30 - 17:30 Poster Discussion with coffee

## SESSION 2: Physical Biology of Biomechanics

Chair: Jie YAN

17:30 – 18:00 [1.8] H. Benjamin PENG  
Hong Kong University of Science and Technology, Hong Kong  
**The Physical Biology of Nicotinic Receptors: Electric Field and Mechanobiology**

18:00 – 18:30 [1.9] Xiaoqiang YAO  
Chinese University of Hong Kong, Hong Kong  
**Heteromeric Co-assembly of TRPV4, TRPC1 and TRPP2 to form a Flow-sensitive Channel**

18:30 – 19:00 [1.10] Pingbo HUANG  
Hong Kong University of Science and Technology, Hong Kong  
**Mechanosensitive Epithelial Chloride Channel CFTR**

20:00

Banquet

## December 22, 2011 (Thursday)

### PLENARY LECTURE

Co-Chairs: Joseph T. Y. WONG and Weijia WEN

09:30 - 10:30

[PL-3] John F. MARKO

Northwestern University, USA

**Micromechanical Study of Large-Scale Mitotic Chromosome Structure**

10:30 - 10:45

Coffee Break

### SESSION 1: Physical Biology of Cells and Biopolymers II

Co-Chairs: Atsushi IKAI and Jung-Hsin LIN

10:45 – 11:15

[2.1] Yihua ZHOU

Chinese Academy of Sciences, China

**Insights into Cellulose Biosynthesis and Cell Wall Remodeling in Rice**

11:15 – 11:45

[2.2] Ning LI

Hong Kong University of Science and Technology, Hong Kong

**Functional Phosphoproteomics in the Plant Hormone Ethylene Signaling**

11:45 – 12:15

[2.3] Junmin PAN

Tsinghua University, China

**Mechanisms of Ciliary Assembly and Disassembly : Lessons from Chlamydomonas**

12:15 – 12:45

[2.4] Robert QI

Hong Kong University of Science and Technology, Hong Kong

**Microtubule Organization and Regulation: The Ends Are the Beginning**

12:45 - 14:00

Lunch

14:00 - 14:30

[2.5] Lei Han TANG

Hong Kong Baptist University, Hong Kong

**Pattern Formation in Engineered Bacteria Colonies**

14:30 – 15:00

[2.6] Kenny K. CHUNG

Hong Kong University of Science and Technology, Hong Kong

**The Role of Protein Aggregation in Neurodegenerative Disorders**

15:00 – 15:30 [2.7] Jung-Hsin LIN  
National Taiwan University, Taiwan  
**Dynamics of Membrane Communicating Proteins and Drug Design**

15:30 - 15:45 Coffee Break

## SESSION 2: Physical Biology of Microfluidics

Chair: Jianhua QIN

15:45 – 16:15 [2.8] Yi-Kuen LEE  
Hong Kong University of Science and Technology, Hong Kong  
**Micro Chaotic Mixer to Enhance Capturing of Circulating Tumor Cells for Early Cancer Diagnostics**

16:15 – 16:45 [2.9] Je-Kyun PARK  
Korea Advanced Institute of Science and Technology, Korea  
**Programmable Optoelectrofluidic Immunoassays**

16:45 – 17:15 [2.10] Levent YOBAS  
Hong Kong University of Science and Technology, Hong Kong  
**Microdevices for Single-Cell Analysis**

17:15 – 17:45 [2.11] Jianhua QIN  
Chinese Academy of Sciences, China  
**Bioinspired Microfluidic Approach for Biomimetic System**

17:45 Closing Remarks



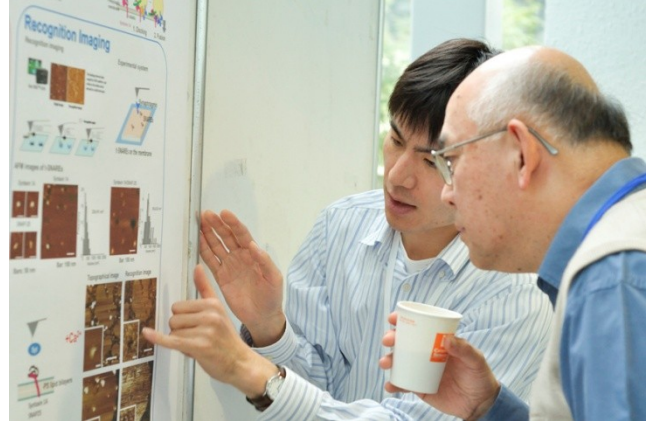
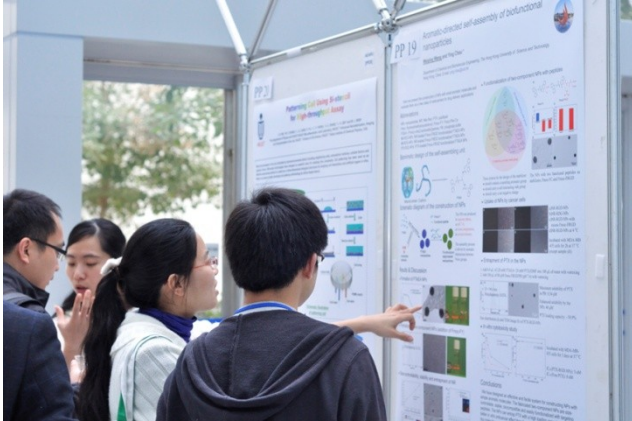
**Registration**



## Scientific Program



## Poster Session



## Closing Remarks





## **AEARU FUNDING REPORT**

### **The 11<sup>th</sup> AEARU Workshop on Molecular Biology and Biotechnology “Physical Biology”**

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At the time of application, the original intention was to use the AEARU funding to provide AEARU Travel Award for ten postgraduate students (from AEARU member institution) to attend the workshop. The intention was to encourage students from non- Hong Kong member universities to travel to attend the workshop. In reality, however, not every member university took advantage of the invitation to receive the assistance. Ultimately, seven students from member universities were selected by the Scientific Committee to receive the funding for a total of US\$6750 (Table I).

Four AEARU Poster Awards (US\$250 each) were also awarded to four poster presenters in the Poster Sessions (Table II).

**Table I: AEARU Travel Award recipients**

HAN Hana (KAIST)	USD 1,000.00 <b>(~HKD 7,808.00)</b>
KIM Mina (KAIST)	USD 1,000.00 <b>(~HKD 7,808.00)</b>
LIU Yunlong (Tsinghua University)	USD 1,000.00 <b>(~HKD 7,808.00)</b>
MURATA Kei(Kyoto University)	USD 1,000.00 <b>(~HKD 7,808.00)</b>
SHI Dong (Tohoku University)	USD 750.00 <b>(~HKD 5,856.00)</b>
TAKASHI Hirohide (Kyoto University)	USD 1,000.00 <b>(~HKD 7,808.00)</b>
MAYA Suzuki (Kyoto University)	USD 1,000.00 <b>(~HKD 7,808.00)</b>

Total: US\$ 6750

**Table II: AEARU Poster Award Recipients**

BOUGOT-ROBIN Kristelle (HKUST)	USD 250.00 <b>(~HKD 1,952.00)</b>
KIM Mina (KAIST)	USD 250.00 <b>(~HKD 1,952.00)</b>
TAKAHASHI Hirohide (Kyoto University)	USD 250.00 <b>(~HKD 1,952.00)</b>
WU Jinbo (HKUST)	USD 250.00 <b>(~HKD 1,952.00)</b>

Total: US\$ 1000