

# Symposium C

Biomedical Devices and Instruments

Sponsors : Baracorp Technologies Pte Ltd

4 July 2005

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07:30 - 08:30	Registration
08:30 - 09:45	Opening Ceremony
09:45 - 10:30	Plenary 1: <i>Nobel Laureate - Roald Hoffmann</i> <i>"Waiting to be Made"</i>
10:30 - 11:00	Coffee Break

## Technical Session 1 - Biosensors

Session Chairs: Paolo Dario, Santhiagu Ezhivalavan

<b>C-1-IN1</b> (Invited 1)	11:00 - 11:30	Advanced Biophotonics: From Nanobiosensors to Biochips <i>Tuan Vo-Dinh</i>
<b>C-1-OR1</b>	11:30 - 11:50	Nanomaterial based Biosensors <i>Changming Li</i>
<b>C-1-OR2</b>	11:50 - 12:10	Characterization of Cells by Optical Sensors based on Si-Epitaxial Layer <i>Zhou Xiaodong, Poenar Daniel Puiu, Tan Swee Ngin, Mircea Bercu, Lee Aicheng, Heng Chew Kiat</i>
<b>C-1-OR3</b>	12:10 - 12:30	Study on a Dual pH/NH <sub>4</sub> <sup>+</sup> Electrode-based Disposable Potentiometric Biosensor for the Creatinine Determination <i>Nien-Hsuan Chou, Jung Chuan Chou, Tai Ping Sun, Shen Kan Hsiung</i>
	12:30 - 14:00	Lunch

## Technical Session 2 - Medical Devices

Session Chairs: D S Nagesh

<b>C-2-IN2</b> (Invited 2)	14:00 - 14:30	Sensory Feedback in Endoluminal Medical Devices <i>Paolo Dario</i>
<b>C-2-IN3</b> (Invited 3)	14:00 - 15:00	A Guide Wire Pressure Sensor and its Applications during Treatment of Coronary Disease <i>Leif Smith</i>
<b>C-2-OR4</b>	15:00 - 15:20	Fuzzy Techniques with Aggregation Operators for Classification and Optimization of Epilepsy Risk Level from EEG Signals <i>R.Harikumar, R.Sukanesh</i>
<b>C-2-OR5</b>	15:20 - 15:40	Design and Clinical Usage of Smart Nickel-Titanium Endodontic Instruments <i>Y.F. Zheng, L. Li</i>
<b>C-2-OR6</b>	15:40 - 16:00	Neural Network based SEMG Recognition for Driving Exoskeleton System <i>Leong-Yeo Wai, John Heng, Qing Li</i>
<b>C-2-OR7</b>	16:00 - 16:20	Electric Field Mattress (EFM) For Children With Eczema <i>Kwong Luck Tan, Francis Tay, Hugo Van Bever</i>
<b>C-2-OR8</b>	16:20 - 16:40	Segmentation of Biological Images using Rule-Based Approach <i>Nemeli G.M Shankar, Z.W. Zhong</i>
	16:30 - 18:00	Coffee Break / Bus to UCC
	18:00 - 19:00	NUS Centennial Public Lecture 1 <i>Nobel Laureate - Steven Chu</i>
	19:00 - 20:00	NUS Centennial Public Lecture 2 <i>Nobel Laureate - Alan MacDiarmid</i>
	20:00 - 20:30	Bus to Hotels

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5 July 2005

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07:30 - 08:30	Registration & Setting up of Posters at Gallery
08:30 - 09:15	Plenary 2: <i>Nobel Laureate - Steven Chu</i> <i>"Miniaturization in biology"</i>
09:15 - 10:00	Plenary 3: <i>Subra Suresh</i> <i>"Materials Science Approaches for Cell Biology and Human Disease State"</i>
10:00 - 10:30	Coffee Break

## Technical Session 3 - Microfluidics

Session Chairs: Teruo Fujii, Wen-Tso Liu

<b>C-3-IN4</b> (Invited 4)	10:30 - 11:00	Microfluidics/CMOS Orthogonal Capabilities for Cell Biology <i>Nico F. de Rooij, Sander Koster, Vincent Linder, Tobias Kraus, Elisabeth Verpoorte, Wendy Franks, Flavio Heer, Andreas Hierlemann</i>
<b>C-3-IN5</b> (Invited 5)	11:00 - 11:30	A Rapid Real-time Quantitative PCR on a Modular Microfluidic Biochip with 8 Second Cycle Time <i>Haiqing Gong, Jing Che, Naveen Ramalingam, Chiew Hoon Neo, Longqing Chen</i>
<b>C-3-OR9</b>	11:30 - 11:50	Fluidlenses: Variable Focus Liquid Lenses <i>Isabel Rodriguez, Saman Dharmatilleke Peter Moran, Kau Aik Hau</i>
<b>C-3-OR10</b>	11:50 - 12:10	Magnetic-based Microfluidic Platform for Biomolecular Separation <i>Qasem Ramadan, Chen Yu, Victor Samper, Daniel Poenar</i>
<b>C-3-OR11</b>	12:10 - 12:30	Controlling the Fluid Velocity by Changing the Surface Properties of Bio-MEMS used in Organic Microfluidic Devices <i>Marshal Dhayal, Hyung Gon Jeong, Jeong Sik Choi</i>
	12:30 - 14:00	Lunch

## Technical Session 4 - Actuators/Materials

Session Chairs: Susan Trolier-McKinstry, Kjell Nelson

<b>C-4-IN6</b> (Invited 6)	14:00 - 14:30	Novel Polymeric Scaffolds: Platforms for Tissue Engineering <i>Buddy D. Ratner, Ceci Giachelli, Charles Murry, Elizabeth Donaldson, Andrew Marshall, Ben Beckstead, Michael Linnes, Derek Mortisen, Kip Hauch, Stephanie Bryant, Sandy Kern Sin Chian</i>
<b>C-4-IN7</b> (Invited 7)	14:30 - 15:00	Piezoelectric Thin Films for Biomedical Devices <i>Susan Trolier-McKinstry</i>
<b>C-4-OR12</b>	15:00 - 15:20	Enhancement of Permeability of Silicone Elastomer Rubber with Dual Flexible Ultrasound Transducers <i>Swee Hock Yeo, Hongye Zhang</i>
<b>C-4-OR13</b>	15:20 - 15:40	Characterization and Modeling of a Fluidic Muscle Actuator <i>Weihua Li, K Goor, P B Kososih</i>
<b>C-4-OR14</b>	15:40 - 16:00	High Speed Magnetic Separation of Ferrite Nanobeads Using Ni Wires in Liquid Flow System for Biomedical Applications <i>Masaru Tada, Ryuichi Shimazu, Nobuhiro Matsushita, Masanori Abe</i>
<b>C-4-OR15</b>	16:00 - 16:20	Tetrahedral Amorphous Carbon: Bio-compatible Coating for Metal and Polymer Surfaces <i>Li Kang Cheah, Xu Shi</i>
<b>C-4-OR16</b>	16:20 - 16:40	Controlling the Third Dimension of Electrodes for Dielectrophoretic Cell Manipulation <i>Guolin Xu, Victor Samper, Ciprian Iliescu, Mary B. Chan-Park</i>
	16:30 - 18:00	Coffee Break / Bus to UCC
	18:00 - 19:00	NUS Centennial Public Lecture 3 <i>Nobel Laureate - Carl Wieman</i>
	19:00 - 20:00	NUS Centennial Public Lecture 4 <i>Nobel Laureate - Roald Hoffmann</i>
	20:00 - 20:30	Bus to Hotels

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6 July 2005

07:30 - 08:30	Registration & Setting up / Removal of Posters at Gallery
08:30 - 09:15	Plenary 4: <i>Nobel Laureate - Alan MacDiarmid</i> “ <i>Electronic Polymers: Novel Materials for the 21st Century</i> ”
09:15 - 10:00	Plenary 5: <i>C.N.R. Rao</i> “ <i>Chemical Routes to Nanomaterials</i> ”
10:00 - 10:30	Coffee Break

## Technical Session 5 – Biosensors

Session Chairs: Nico F. de Rooij, Marcelo H. Ang Jr

<b>C-5-IN8</b> (Invited 8)	10:30 - 11:00	Development of Microfluidic-Based Point-of-Care Diagnostic Systems <i>Paul Yager, Jennifer O. Foley, Elaine Fu, Elena Garcia, Melissa Hasenbank, Kristen Helton, Kjell Nelson</i>
<b>C-5-IN9</b> (Invited 9)	11:00 - 11:30	Mechatronics Application to Patch Clamp Setup for Electrophysiological Studies <i>Marcelo H Ang Jr, Wee-Liat Ong, Wei-Yi Ong, Chee-Leong Teo</i>
<b>C-5-OR17</b>	11:30 - 11:50	<b>(WITHDRAWN)</b> Biomedical Sensor using Thick Film Technology for Transcutaneous Oxygen Measurement <i>Yu-Zhi Liza Lam, John K. Atkinson</i>
<b>C-5-OR18</b>	11:50 - 12:10	Biosensing Application of Dielectric Ba <sub>2/3</sub> Sr <sub>1/3</sub> TiO <sub>3</sub> Film <i>Wei Qiu, Ooi Kiang Tan, Xiangyi Fang, Xiaoqing Fang, YY Gan</i>
<b>C-5-OR19</b>	12:10 - 12:30	Multilayer System of Surface Plasmon Resonance Based Optical Biosensor <i>Manwen Yao, John C. Wolfe, Ooi Kiang Tan, Swee Chuan Tjin</i>
	12:30 - 14:00	Lunch / Theme Lecture by Denis Fichou “ <i>Building-up Supramolecular Self-Assemblies on Surfaces: Towards Molecular Nanoelectronics</i> ”
	14:00 – 16:30	<b>Poster Session</b>
	16:30	Coffee Break / Free & Easy

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**7 July 2005**

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07:30 - 08:30	Removal of Posters at Gallery
08:30 - 09:15	Plenary 6: <i>Nobel Laureate - Carl Wieman</i>
09:15 - 10:00	Plenary 7: <i>Bernard Raveau</i>
10:00 - 10:30	Coffee Break

## Technical Session 7 - Microfluidics

Session Chairs: Dan V Nicolau, Ciprian Iliescu

<b>C-7-IN10</b> (Invited 10)	10:30 - 11:00	Biocompatible and Biodegradable Microfluidic Devices for Tissue Engineering Applications <i>Teruo Fujii</i>
<b>C-7-IN11</b> (Invited 11)	11:00 - 11:30	Novel Flat Screen Braille Display Technology for the Blind and Partially Sighted <i>J. S. Lee, S Lucyszyn</i>
<b>C-7-OR20</b>	11:30 - 11:45	Dielectrophoresis Filter for Capture and Separation of Cells <i>Guolin Xu, Victor Samper, Mary B. Chan-Park, Mahesh Choolani</i>
<b>C-7-OR21</b>	11:45 - 12:00	A Comparative Study of Pressure Measurement at the Denture Base-Mucosal Surface Interface using Strain Gauges <i>Ravinder Agarwal, Komal Sehgal</i>
<b>C-7-OR22</b>	12:00 - 12:15	Plastic Flow-through ELISA Array Protein Chip <i>Chang Ming Li, Ling Yu, Jie Gao, Jianmin Miao</i>
<b>C-7-OR23</b>	12:15 - 12:30	Monitoring and Tracking of Single Cell Migration and Deformation using an in-vitro model Microfluidic System <i>M. Manimaran, K.C.Chaw, Francis E.H.Tay</i>
	12:30 - 14:00	Lunch / Theme Lecture by Teruo Okano <i>"Intelligent Surfaces for Cell Sheet Engineering"</i>

## Technical Session 8 - Medical Devices

Session Chairs: Leif Smith, Francis Tay

<b>C-8-IN12</b> (Invited 12)	14:00 - 14:30	In-Vitro Evaluation of Blood Oxygenators <i>Nagesh.D.S, Muraleedharan.C.V, Bhuvaneshwar.G.S</i>
<b>C-8-OR24</b>	14:30 - 14:50	Development of Polyvinyl Alcohol and Glycine Composite Membranes for Wound Dressing <i>Kunal Pal, Ajit K. Banthia, D. K. Majumdar</i>
<b>C-8-OR25</b>	14:50 - 15:10	Development of PMMA Polymer Biochips for Protein Analysis Using Chemical Injection Method <i>J. Zhao, W. S. Law, F. Y. Li</i>
<b>C-8-OR26</b>	15:10 - 15:30	Integration of Optical Fiber Light Guide, Fluorescence Detection System, and Multichannel Disposable Microfluidic Chip <i>Rudi Irawan</i>
<b>C-8-OR27</b>	15:30 - 15:50	Nanofilters fabricated by stress controlled Si <sub>3</sub> N <sub>4</sub> membrane for cell culture <i>Jiashen Wei, Francis E.H. Tay, Ciprian Iliescu, Kwong Joo Leck</i>
	16:00 – 16:30	Coffee Break

## Technical Session 9 - Materials

Session Chairs: Ajit K Banthia, Jeremy Loh

<b>C-9-IN13</b> (Invited 13)	16:30 - 17:00	Control of Actomyosin Motility by Electric Fields <i>Dan V. Nicolau, Kristi L. Hanson and Gerardin Solana</i>
<b>C-9-IN14</b> (Invited 14)	17:00 - 17:30	The Effect of Dynamic Compressive Stimulation for Mechano-active Cartilage Tissue Engineering <i>S H Kim, Y. Jung, Y.H. Kim, S-H. Kim, H.J. You, J. Xie, T. Matsuda</i>
<b>C-9-OR28</b>	17:30 - 17:50	A Biomedical Device for Systemic Gene Delivery <i>Gustav Steinhoff, Wenzhong Li, Nan Ma, Alexander Kaminski, Yeong-Hoon Choi, Christof Stamm, Guping Tang, Niels Grabow</i>
<b>C-9-OR29</b>	17:50 - 18:10	A Novel Polymer for Systemic Gene Delivery <i>Gustav Steinhoff, Wenzhong Li, Nan Ma, Catharina Nesselmann, Andreas Liebold, Christof Stamm, Guping Tang, Klaus-Peter Schmitz</i>
	18:30 - 22:30	Conference Banquet
	22:30 - 20:45	Bus to Hotels

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8 July 2005

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08:30 - 09:15	Plenary 8: <i>Masuo Aizawa</i> “Bio-Nanotechnology/Nano-Biotechnology Challenges for Intelligent Materials and Systems”
09:15 - 10:00	Plenary 9: <i>Chenming Hu</i> “The Roles of New Materials in Future CMOS Technology”
10:00 - 10:30	Coffee Break

## Technical Session 10 - Microfluidics

Session Chairs: Soo Hyun Kim, Thomas Haiqing Gong

<b>C-10-IN15</b> (Invited 15)	10:30 - 11:00	Continuous Plastic Lamination Process for Biomedical Devices <i>Ki Bang Lee</i>
<b>C-10-IN16</b> (Invited 16)	11:00 - 11:30	Environmental Microbiology-on-a-chip and Its Future Impacts <i>Wen-Tso Liu</i>
<b>C-10-OR30</b>	11:30 - 11:50	A Dielectrophoretic Microsystem for Separation and Accumulation of Bioparticles <i>Dafeng Chen, Hejun Du, Weihua Li</i>
<b>C-10-OR31</b>	11:50 - 12:10	A DEP Chip with 3D Electrodes and Lateral Inlet/Outlet <i>Liming Yu, Francis E.H.Tay, Guolin Xu, Victor Samper, Ciprian Iliescu</i>
<b>C-10-OR32</b>	12:10 - 12:30	Design and Simulation of an Integrated Drug Delivery Device <i>Zhenxian Yu, Yanru Shi, Hung-Yao Hsu, Lingxue Kong</i>
	12:30 - 14:00	Lunch

## Technical Session 11 - Materials

Session Chairs: Stepan Lucyszyn, M. Manimaran

<b>C-11-IN17</b> (Invited 17)	14:00 - 14:30	Novel Polyamidoamine Dendrimer based Network Polymer for controlled Delivery of Tetracycline Drug <i>Ajit K. Banthia, Samaresh Ghosh</i>
<b>C-11-OR33</b>	14:30 - 14:50	<b>(WITHDRAWN)</b> Covalent Immobilization of Antibodies on Polyaniline Films <i>V.V.R.Sai, S.Mhajan, A.Q.Conrator, S.Mukherji</i>

<b>C-11-OR34</b>	14:50 - 15:10	Co-culture of Hepatocytes and Endothelial Cells on Polymeric Scaffolds realised by PAM System <i>Giovanni Vozzi, Bruna Vinci, Daniela Cavallone, Maurizia Brunetto</i>
<b>C-11-OR35</b>	15:10 - 15:30	Development of Crosslinked Polyvinyl Alcohol and Starch Hydrogels for Wound Dressing <i>Kunal Pal, A K Banthia, D K Majumdar</i>
<b>C-11-OR36</b>	15:30 - 15:50	Polymer based Gene Delivery for Artificial Heart Valve <i>Gustav Steinhoff, Nan Ma, Wenzhong Li, Ferenc Oeri, Alexander Kaminski, Andreas Liebold, Christof Stamm, Guping Tang</i>
	16:00 - 16:30	Coffee Break

## Technical Session 12 - Medical Devices

Session Chairs: Ki Bang Lee, Santhiagu Ezhilvalavan

<b>C-12-IN18</b> (Invited 18)	16:00 - 16:30	MEMSWear: Biomonitoring Devices That You Can Wear! <i>Francis E.H. Tay</i>
<b>C-12-OR37</b>	16:30 - 16:50	Stress analysis of Link SB Charite (III) Disc <i>B. Wang, G. Lu</i>
<b>C-12-OR38</b>	16:50 - 17:10	Monte Carlo Simulation on Light Propagation in Ocular Tissue for Glaucoma Treatment <i>Dongxia Hou, Bryan, Kok Ann Ngoi</i>
<b>C-12-OR39</b>	17:10 - 17:30	<b>(WITHDRAWN)</b> The Locomotion Systems for Self-Propelled Endoscopes <i>Yanru Shi, Jane Yu, Lingxue Kong, Hung-Yao Hsu</i>
<b>C-12-OR40</b>	17:30 - 17:50	Nanomechanical Characteristics of Pre- and Post-wear Hydrogel Contact Lenses <i>Dehua Yang, Jennifer Forte, Rick Nay, Jeff Turek, Thomas J. Wyrobek</i>
	18:00	End of Conference

## **SYMPOSIUM C, Poster Session**

Date :Wednesday, 6 July 2005

Time : 14:00 – 16:30

- C-6-PO1** Hydrophilic and Hydrophobic Patterned Template for DNA Chip Microarrays  
*Yong-Sung Choi, Jong-Seok Yang, Kyung-Sup Lee, Dae-Hee Park*
- C-6-PO2** pH Measurement System Using Wireless Technology  
*Jun-Jie Feng, Jung-Chuan Chou, Tai-Ping Sun, Shen-Kan Hsiung*
- C-6-PO3** Study on Nonideal Effects for TiO<sub>2</sub> Extended Gate Field Effect Transistor  
*Jung Chuan Chou*
- C-6-PO4** Study on Stability for TiN pH-Electrodes  
*Jung Chuan Chou*
- C-6-PO5** Study of the Conducting Polymer Modified Electrode Based on Ruthenium Oxide Thin Film and Application on Ion Sensing Device  
*Jung Chuan Chou, Diing Jia Tzeng*
- C-6-PO6** Nanomaterials for Sensitivity Enhancement of SPR Biosensing of Steroids  
*Yinqiu Wu, John S. Mitchell, Christian J. Cook, Lyndsay Main*
- C-6-PO7** Study of Titanium Oxide Thin Film of Extended Gate H<sup>+</sup>-Ion Sensitive Field Effect Transistor by Sol-gel Method  
*Jung-Lung Chiang, Pin-Chuan Yao, Ming-Chih Lee, Jun-Chin Liu*
- C-6-PO8** Using TGD® Device to produce Autologous Thrombin and Platelet Gel in Clinical Application  
*Jui-Che Tsai, Thierry Burnouf, Tim-mo Chen, Ko-shao Chen*
- C-6-PO9** Acetic Acid Plasma Treatment of PP-Nonwoven and PLGA for Improve ES-Cell Adhesion  
*Ko-Shao Chen, Su-Chen Chen, Jui-lung Chien, Shih-Hwa Chiou, Fu-Ting Tsat*
- C-6-PO10** Fabrication of Easy-Strip Gelatin Scaffold Membrane and Application in Cornea Epithelium Cell Culture  
*Ko-Shao Chen, Su-Chen Chen, Jui-Che Tsai, Yi-Chun Yeh, Shih-Hwa Chiou, Ta-Lee Chang*
- C-6-PO11** Prussian Blue-modified Indium Tin Oxide Electrode for Microfabricated Electrochemical Detector  
*In-Je Yi, Ju-Ho Kim, C.J. Kang, Yong-Sang Kim*
- C-6-PO12** Temporary Supports to Fragile Biomedical MEMS Sensors for Improving Reliability while Transportation  
*Amit Vartak, Prakash Apte, Sudhir Chiluveru*
- C-6-PO13** A SnO<sub>2</sub>/ITO-based pCO<sub>2</sub> Sensor for Blood Gas Analysis  
*Jung-Chuan Chou, Tai-Ping Sun, Shen-Kan Hsiung*
- C-6-PO14** Study on the Portable pH Sensing System based on a Separative Extended Gate Field Effect Transistor  
*Gin-Chou Yang, Jung-Chuan Chou, Tai-Ping Sun, Shen-Kan Hsiung*
- C-6-PO15** Technological Process to Manufacture Ceramic Microelectrodes for Biomedical Applications Implying Microextrusion of Pre-Ceramic Resins  
*Giuseppe Perale, Roberto Contro, Simone Maccagnan*

- C-6-PO16** Iron Nanoparticle-amplified Screen-printed Amperometric Glucose Biosensor  
*Wen-Chang Chen, Hung-Yuan Fang, Bo-Wen Lu*
- C-6-PO17** A Novel Structured Polydimethylsiloxane (PDMS) Microvalve Actuated with Paraffin  
*Jong-Chul Yoo, C.J. Kang, Yong-Sang Kim*
- C-6-PO18** Fluorescent Probes for Superoxide based on Conjugated Polymer with a Nonredox Mechanism  
*Wei Huang, Yi Chen, Kan-Yi Pu, Qu-Li Fan*
- C-6-PO19** Silanization and Antibody Immobilization on SU-8  
*Manoj Joshi, Ramgopal Rao, Soumyo Mukherji*
- C-6-PO20** Preparation and Release Behaviors of Chitosan Microcapsules Containing Indomethacin  
*Yun-Mok Lee, Soo-Jin Park*
- C-6-PO21** Synthesis, Characterization and Photophysical Properties of New Type Water-soluble Conjugated Polymers Containing Zwitterionic Group  
*Wei Huang, Ying Zhou, Quli Fan*