2016 APCBEES SINGAPORE CONFERENCE ABSTRACT

March 12-14, 2016

Hotel Royal Singapore

Singapore

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A0006: Simulation of Quadruple-effect Evaporator with Vapor Bleeding Used for Juice Heating

    Somchart Chantasiriwan

2016 APCBEES Singapore Conference Introductions

Welcome to CBEES 2016 conferences in Singapore. The objective of the Singapore conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Biomedical Engineering and Technology, Environment and Industrial Innovation, Food Engineering and Biotechnology.

2016 6th International Conference on Biomedical Engineering and Technology (ICBET 2016)

❈ **Paper publishing and index**: **ICBET 2016** papers will be published in **International Journal of Pharma Medicine and Biological Sciences (IJPMBS, ISSN: 2278-5221)**, which will be included in the Engineering & Technology Digital Library, and indexed by Embase (Under elsevier), ProQuest, Google Scholar, Chemical Abstracts Services (CAS), Indian Science, ICMJE(International Committee Medical Journal Editors), HINARI(World Health Organization), and NYU(Health Sciences Library).

❈ **Conference website and email**: **http://www.icbet.org/; icbet@cbees.org.**

2016 6th International Conference on Environment and Industrial Innovation (ICEII 2016)
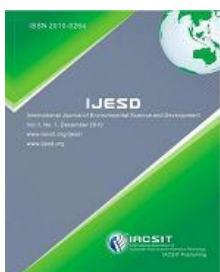
❈ **Paper publishing and index**: **ICEII 2016** papers will be published in the **Journal of Environmental Science and Development (IJESD, ISSN:2010-0264)**, and all papers will be included in the Engineering & Technology Digital Library, and indexed by WorldCat, Google Scholar, Cross ref, ProQuest, CABI and sent to be reviewed by EI Compendex and ISI Proceedings.

❈ **Conference website and email**: **http://www.iceii.org/; iceii@cbees.org.**

2016 7th International Conference on Food Engineering and Biotechnology (ICFEB 2016)

❈ **Paper publishing and index**: **ICFEB 2016** papers will be published in **International Journal of Food Engineering (IJFE, ISSN: 2301-3664)**, and be included in the Engineering & Technology Digital Library, and indexed by WorldCat, Google Scholar, Cross ref, ProQuest, CABI.

❈ **Conference website and email**: **http://www.icfeb.org/; icfeb@cbees.org.**

Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
Digital Projectors and Screen
Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):

Regular Oral Presentation: about **10** Minutes of Presentation and **5** Minutes of Question and Answer
Keynote Speech: about **30** Minutes of Presentation and **10** Minutes of Question and Answer

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-made Posters
Maximum poster size is A1
Load Capacity: Holds up to 0.5 kg

Best Presentation Award

One Best Oral Presentation will be selected from each presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on March 13, 2016.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions

Keynote Speaker I

Prof. Ki-Hyun Kim

Department of Civil & Environmental Engineering, Hanyang University, South Korea

Prof. Ki-Hyun Kim has been working on the development and establishment of sampling and analytical methodologies of heavy metals (with a major emphasis on Hg, Pb, and Cd) and hazardous/odorous pollutants (volatile organic compounds, reduced sulfur compounds, carbonyls, volatile fatty acids, etc) along with the establishment of basic QA for those pollutants. He was awarded a National Star Faculty offered by the Korean Ministry of Education, Science and Technology in 2006. He is currently serving as editorial members of journals like Sensors, Scientific World, and several others. He has published more than 300 articles in peer-reviewed international SCI journals.

Topic: "The Pursuit of Ideal Options for the Monitoring and Abatement of Volatile Organic Compounds in Air"

Abstract: Volatile organic compounds (VOCs) are organic compounds with high vapor pressures emitted into the atmosphere via both anthropogenic and biogenic source processes. The major classes of gaseous VOCs are alkanes, alkenes, aromatic hydrocarbons, oxygenated compounds, and so on. Enormous efforts have been devoted to the development of abatement technologies for one of the key airborne pollutants including volatile organic compounds (VOCs). To support or replace all the conventional options employed for the management of VOC pollution, many new options have been invented and employed for the monitoring and treatment technology of VOCs. In this report, I describe the basic aspects of VOC pollution, technological advances made in their detection, especially in association with new materials, and general aspects of their abatement tactics.

Keynote Speaker II

Associate Prof. Gautam Sethi

Department of Pharmacology, Yong Loo Lin School of Medicine, National University of Singapore, Clinical Research Centre, Singapore

EDUCATION/TRAINING

B. S. 1998 Banaras Hindu University, Varanasi, India Chemistry (Honours)

M. S. 2000 Banaras Hindu University, Varanasi, India Biochemistry

Ph.D 2004 Banaras Hindu University, Varanasi, India Biotechnology

PDF 2004-07 UTMDACC Houston, Texas, USA. Cancer biology.

Asst Prof. 2008-14 National University of Singapore Pharmacology

Associate Prof. 2014- Now National University of Singapore

POSITIONS AND EMPLOYMENT

Sept. 2000 to Aug. 2002   Junior Research Fellow, School of Biotechnology, Banaras Hindu University, Varanasi, India.

Sept. 2002 to March 2004   Senior Research Fellow, School of Biotechnology, Banaras Hindu University, Varanasi, India

2004-2007   Postdoctoral Fellow, The University of Texas MD Anderson Cancer Center.

2008-2014   Assistant Professor, Dept. of Pharmacology, NUS.

2014-Now   Associate Professor with tenure, Dept. of Pharmacology, NUS.

Topic: "Targeting Oncogenic Transcription Factor for Cancer Therapy"

Abstract: Conventional anti-cancer therapeutic strategies involve the use of chemically synthesized drugs and/or administration of high-energy radiation to circumvent tumor growth. However, these strategies are generally poorly tolerated, often resulting in adverse side effect. As such, there is an urgent need to develop novel anti-cancer therapeutic agents that not only overcome the chemoresistance barricade, but also elicit minimal side effects and is well tolerated amongst patients of diverse demographics. Plant-based natural drugs contributes to primary health care in approximately 80% of the world's population, with uses dating back to the ancient times as traditional herbal medicine by physicians such as Hippocrates.   Our group is currently exploring the role of STATs family of cytoplasmic transcription factors that transmit signals, mediate intracellular signaling usually generated at cell surface receptors and transmitted to the nucleus. There is a strong evidence to suggest that aberrant STAT3 signaling promotes development and progression

of human cancers by either inhibiting apoptosis or inducing inflammation, cell proliferation, angiogenesis, invasion, and metastasis. Suppression of activation of STAT3 results in the induction of apoptosis in tumor cells, and accordingly its inhibition by approaches such as tyrosine kinase inhibitors, antisense oligonucleotides, decoy nucleotides, dominant negative proteins, RNA interference and chemopreventive agents have been employed to suppress the tumorigenicity. However, the development of novel drugs for the targeting STAT3 that is both safe and efficacious remains an important scientific and clinical challenge. My talk will provide the evidence for critical roles of STAT3 in oncogenesis and discusses the potential for development of novel cancer therapies based on mechanistic understanding of STAT3 signaling.

Brief Schedule for Conferences

Day 1	**March 12, 2016 (Saturday) 10:00~17:00** **Venue: Room 01-02 (Level 1)** Arrival Registration
Day 2	**March 13, 2016 (Sunday) 8:30~18:10** **Venue: Royal Room 1 (Level 3)** Arrival Registration, Keynote Speech, and Conference Presentation
	Morning Conferences
	Venue: Royal Room 1 (Level 3) Opening Remarks 8:30~8:40 Keynote Speech I 8:40~9:20 Keynote Speech II 9:20~10:00 Coffee Break & Photo Taking 10:00~10:30 **Session 1:** 10:30~12:30 (8 presentations-Topic: "Medical Science")
	Lunch 12:30~13:30 **Venue: Hotel Restaurant**
	Afternoon Conferences
	Session 2: 13:30~15:30 **Venue: Royal Room 1 (Level 3)** 8 presentations-Topic: "Medical Science"
	Coffee Break 15:30~15:55
	Session 3: 15:55~18:10 **Venue: Royal Room 1 (Level 3)** 9 presentations-Topic: "Environment & Food Science"
	Dinner:18:30 **Venue: Hotel Restaurant**
Day 3	**March 14, 2016 (Monday) 9:30~17:30** One Day Visit & Tour

Tips:
Please arrive at conference room 10 minutes before the session beginning to upload PPT into the conference laptop.

Detailed Schedule for Conferences

March 12, 2016 (Saturday)

Venue: Room 01-02 (Level 1)

10:00~17:00	Arrival and Registration

Note: (1) The registration can also be done at any time during the conference.

(2) The organizer doesn't provide accommodation, and we suggest you make an early reservation.

(3) One Best Oral Presentation will be selected from each oral presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on March 13, 2016.

Morning, March 13, 2016 (Sunday)

Venue: Royal Room 1 (Level 3)

8:30~8:40		**Opening Remarks** Associate Prof. Gautam Sethi Department of Pharmacology, Yong Loo Lin School of Medicine, National University of Singapore, Clinical Research Centre, Singapore
8:40~9:20		**Keynote Speech I** Prof. Ki-Hyun Kim Department of Civil & Environmental Engineering, Hanyang University, South Korea Topic: "The Pursuit of Ideal Options for the Monitoring and Abatement of Volatile Organic Compounds in Air"
9:20-10:00		**Keynote Speech II** Associate Prof. Gautam Sethi Department of Pharmacology, Yong Loo Lin School of Medicine, National University of Singapore, Clinical Research Centre, Singapore Topic: "Targeting Oncogenic Transcription Factor for Cancer Therapy"
10:00~10:30		**Coffee Break & Photo Taking**

Let's move to the Sessions!

Session 1

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0001 Presentation 1 (10:30~10:45)

A Comprehensive Assessment of the Performance of Modern Algorithms for Enhancement of Digital Volume Pulse Signals

Aditya Sundar, Vivek Pahwa, Chinmay Das, Mukund Deshmukh, and Neethu Robinson

Texas Instruments, India

Abstract—Digital volume pulse(DVP) refers to the physiological signal that quantifies the changes in blood volume in the artery during breathing. DVP signals are acquired using methods such as invasive catheterization, mechanical tonometry and photoplethysmography. From the DVP signals critical biological parameters such as heart rate, stiffness index, reflectivity index and pulse wave velocity can be computed. These parameters have shown promise in detecting the early onset of cardiovascular disease (CVD). Thus it is critical that these parameters should be estimated with utmost precision. However DVP signals are corrupted with artifacts due to improper mounting of the sensor, power line interference and other random noises in environment. These artifacts would lead to incorrect estimation of the aforementioned parameters. In this paper the authors evaluate the performance of state of the art algorithms for denoising DVP signals. Denoising using wavelet transforms, empirical mode decomposition, adaptive filters, morphological filters, anisotropic diffusion, total variation denoising and non local means algorithm has been considered in our work. Metrics : mean squared error(MSE), mean absolute error(MAE), signal to noise ratio(SNR), peak signal to noise ratio (PSNR), cross correlation and central processing unit(CPU) consumption time have been computed to assess the performance of each of the methods. From our study, it is concluded that multivariate wavelet denoising yields the best performance and is hence the most suitable method for enhancement of DVP signals.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0002 Presentation 2 (10:45~11:00)

Maneuverability Evaluation of a Surgical Robot for Single-Port Surgery

Katsuaki Oiwa, Shotaro Maeda, and Chiharu Ishii

Hosei University, Japan

Abstract—This study evaluates the operability of a surgical robot for single-port surgery (SPS) developed in our laboratory. The surgical robot operates under master–slave control implemented by the haptic interface Omega 7 and is reinforced with a force feedback mechanism. The maneuverability of the surgical robot system was assessed in a block transfer experiment and a ligation experiment. The completion times of forceps manipulation by robot operation were compared with those of manual operation. To assess the force feedback functionality of the surgical robot, we tested whether the robot could properly contact and avoid obstacles when using the forceps. The results verified the effectiveness of the surgical robot system for SPS.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0003 Presentation 3 (11:00~11:15)

Improvement of Performance of Sensory Feedback System for Myoelectric Prosthetic Hand

Takakuni Morita and Chiharu Ishii

Hosei University, Japan

Abstract—In this paper, a control system of the sensory feedback device for myoelectric prosthetic hand users, which was developed in our previous study, was improved to express the hardness of an object continuously. The sensory feedback device is worn on user's upper arm. When the finger of the myoelectric prosthetic hand grabs the object, a contact force on the object is detected by a pressure-sensitive sensor attached on a finger cushion of the myoelectric prosthetic hand. Moreover, the hardness of the object is calculated. According to the hardness of the object, a reference input to realize the corresponding winding speed of the belt is generated by a reference input generator. Then, the motor of the feedback device is controlled to track the reference input by using the self-tuning Proportional-Integral-Derivative (PID) control technique, taking parameter variation into account. Thus, the belt of the feedback device is wound by the motor and tightens the user's upper arm, so that the user can feel a tactile sense. Finally, confirmation tests are conducted to verify the effectiveness of the improved control system. As a result, the hard object and the soft object are able to be distinguished with an average accuracy of 92.5%.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0004 Presentation 4 (11:15~11:30)

Scaling Method for Force Feedback of Forceps Manipulator Based on Beam Theory

Shotaro Maeda, Katsuaki Oiwa, and Chiharu Ishii

Hosei University, Japan

Abstract—In this study, a new scaling method for force feedback is proposed for the surgical robot developed in our laboratory, incorporating an analysis of the shaft of the forceps based on beam theory. A six-axis force and torque sensor is attached to the base parts of the forceps manipulator of the surgical robot to detect a force applied at the tip or shaft part of the forceps. Then, the detected force is amplified using the proposed scaling method and the amplified force is realized through the haptic device Omega 7. Experiments were conducted to verify the effectiveness of the proposed scaling method. The results showed that the operator of the surgical robot can experience a small force that was applied to the forceps more clearly and quickly compared with that realized when the conventional constant scaling method is used.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0005 Presentation 5 (11:30~11:45)

Design and Development of Robotic Rehabilitation Device for Post Stroke Therapy

Si Thu Phyo, Sampath Kumar Karutaa Gnaniar, and Lee Kim Kheng

Singapore Polytechnic, Singapore

Abstract—To help the neurological patients regain mobility to their impaired arms, a robotic rehabilitation device (called RSP-60) is developed for this purpose. This paper presents the development of a lightweight portable robotics elbow brace device that fits snugly onto Asian patients with weak upper-limb impairment for repetitive elbow flexion and extension rehabilitation without the presence of the therapists. The device is integrated with surface electromyogram (S-EMG) sensors for assistive & assessment purpose, LabVIEW based interface and built in signal processing module for interactive actuation of device. A secondary anthropometric data are mainly collected from Asian subjects with age ranges of 18 to 60 years & above and statistically analysed to use as a design guideline. Pilot clinical trial was carried out with post-stroke patients to access a safety aspect of using the device and evaluate the performance of the device in terms of a valuable therapist's time saving, usage of bio‑feedback for active assistive & assessment, usability and users' perception towards using robotics device in rehabilitation. Both experimental condition data and qualitative results are presented and a pain numeric rating scale (NRS) is used for pain assessment tool.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0006 Presentation 6 (11:45~12:00)

Design and Development of Low Cost Silicone Implant Used in Augmentation Rhinoplasty Suitable for the Indian Sub-Continental Population

Adwait Inamdar, **Nikhil Adhe**, Sourabh Shende, Rashmi Uddanwadiker, and Subhash Lulay

Visvesvaraya National Institute of Technology, India

Abstract—The objective of this research was to design and manufacture an implant for Augmentation Rhinoplasty, an additive plastic surgery of nose, to suit the face morphology of patients of the Indian subcontinent and to reduce the cost substantially by incorporating innovative design and manufacturing practices, thus overcoming the twin problems of deficiencies in design of existing implants and the high cost of around $150-$200 which puts them out of the reach of the needy. This research involves the customized design of nasal implant, design and manufacturing of die and setting up a manufacturing process for the implant. Design of implant involved customization of geometrical parameters to suit Indian sub-continental face morphology, solid modeling in Computer Aided Drawing (CAD) software and selection of a suitable implant grade material that fulfills the norms of biocompatibility for long term implantation. The design of die included solid modeling and selection of appropriate material. The solid modelling of the implant and the die was done using Solid Edge software. An appropriate grade of biocompatible Liquid Silicone Rubber (LSR) was selected to achieve required mechanical properties. Die casting process was selected for manufacturing the implant. Die was manufactured by Computer Numerically Controlled (CNC) machining followed by finishing operations to ensure mirror finish. Process parameters for the implant manufacturing were established after several experimental trials and the process was standardized. As a result, implant having desired design features and mechanical properties with no manufacturing defects was obtained. Manufacturing cost of the implant was reduced substantially to $20 apiece. The established standards of manufacturing process and materials in this research can be extended for making implants for other body parts like chin, calf and ear which will benefit trauma victims and those with congenital defects.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0007 Presentation 7 (12:00~12:15)

The Effectiveness of Snail Slime and Chitosan in Wound Healing

Agnes Sri Harti, S. Dwi Sulisetyawati, Atiek Murharyati, Meri Oktariani, and Ika Budi Wijayanti

Kusuma Husada Surakarta School of Health Science, Indonesia

Abstract—Snail slime (*Achatina fulica*) has many functions, including wound or scratch and gingivitis healings, and skin care. The essential substances contained in the snail slime involve glycosaminoglycans and proteins. The proteins have important biological functions, including as a bacterial protein (enzyme) binding receptor. Chitosan is a natural polymer containing a hydroxyl group (OH) and amine groups (NH2) which is positively charged in acidic solution. It is antimicrobial and polycationic, so that it can be used as a coagulant agent. The research aims at finding out the effectiveness of snail slime and chitosan in wound healing. The methods employed in the research included isolation of snail slime, the synthesis of chitosan (2%), and *in vivo* treatment stages using 5 groups of mice as negative controls, snail slime and chitosan (2%). The ratios of snail slime and chitosan examined were 1: 1, 1: 2, and 2: 1. The result shows that snail slime and chitosan (2%) with the ratio of 1: 2 is effective in wound healing. The content of the anti-inflammatory factor in snail slime and antimicrobial.

Morning, March 13, 2016 (Sunday)

Time: 10:30~12:30

Venue: Royal Room 1 (Level 3)

Session 1: 8 presentations-Topic: "Medical Science"

Session Chair: Associate Prof. Gautam Sethi

E0008 Presentation 8 (12:15~12:30)

Finite Element Analysis in Posterior Stabilized Total Knee Arthroplasty on Kneeling

Kittipong Kitisak, Nad Siroros, and Chaiy Rungsiyakull

Chiang Mai University, Thailand

Abstract—The objective of this study was to identify the biomechanics of commercial total knee arthroplasty in kneeling position by Finite Element Method (FEM). Two commercial total knee arthroplasties were created on a 3D Finite Element model of both knee implants at 0, 30, 60, 90, and 120 degrees of knee implant flexion. To identify the contact area and pressure on polyethylene component of both knee implants by Finite Element Method, the largest contact pressures on polyethylene of LPS-Flex and Genesis II are 2.909 and 3.910 MPa presented at 120 degrees on knee implant flexion. The fewest contact pressures on polyethylene are 0.1596 and 0.6389 MPa presented at 0 degree on knee implant flexion. In the same way, the largest contact area of LPS-Flex and Genesis II are 309.786 and 368.68 mm^2 presented at 0 degree on knee implant flexion. The fewest contact area of LPS-Flex and Genesis II are 96.2699 and 129.027 mm^2 presented at 120 degrees on knee implant flexion. The Finite Element Analysis (FEA) was an effective method to identify contact pressures and contact areas of 3D Finite Element model of both knee prostheses.

Lunch	
12:30-13:30	Hotel Restaurant

Session 2

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E0009 Presentation 1 (13:30~13:45)

Medical Image Registration Based on an Advanced Ant Colony Optimization Algorithm

Ting-Xun Lin and **Herng-Hua Chang**

National Taiwan University, Taiwan

Abstract—Image registration is one of the fundamental and essential tasks within image processing. It is the process of determining the correspondence between structures in two images, which are called the template image and the reference image, respectively. The challenge of registration is to find an optimal geometric transformation between corresponding image data. This paper develops a new image registration algorithm that is based on an improved ant colony optimization algorithm. In our approach, the image pixels are treated as the nest of a swarm of ants. The ants are designed to have the ability to forage for the "food" in their memory. Subsequently, the ants deposit pheromone on the pixels, which affect the motion of the ants. The registration process of updating the pheromone, the direction and distance of advancement is repeated until the correlation coefficient between the registered and reference images reaches a maximum. Experimental results indicate that our method accurately transformed the template images into reference images in various scenarios. It is indicated that the proposed method is of potential in a wide variety of image registration applications.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E0010 Presentation 2 (13:45~14:00)

Temperature Compensation of Fiber Bragg-Grating Manometry Catheter Using Kalman Filter

Awad Al-Zaben, **Mohammad Al Bataineh**, and Saad Al-Refaie

Yarmouk University, Jordan

Abstract—This paper presents a method for temperature compensation of fiber Bragg grating based manometry. The catheter used in manometry contains two fibers, one is used for pressure measurements and the other one is used to sense only temperature changes. Therefore, two signals are obtained from the system, and the aim of this paper is to process the two signals to compensate for temperature variations in the pressure signal. An algorithm is developed to compensate for the temperature variations using an autoregressive (AR) model and a Kalman filter. The algorithm fits an AR model to the difference between the two signals and the corresponding coefficients are estimated using Kalman filter. When a pressure signal is detected, the difference signal during the pressure period is considered missing and the previously determined AR model is used to estimate that signal. The estimated signal is then added to the temperature signal and the compensated difference is estimated. The developed algorithm performance is evaluated in this paper using both simulated and measured datasets.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E0011 Presentation 3 (14:00~14:15)

Truncation of PDGF-BB Aptamer by Secondary Structural Analysis and Immunoassay

Cong Vu, Pichayanoot Rotkrua, Yuthana Tantirungrotechai, and Boonchoy Soontornworajit

Thammasat University, Thailand

Abstract—Aptamers demonstrate high binding affinity and specificity to their targets and contribute to a number of applications which require recognition molecules. Typically, original sequences of the aptamers comprised of 80 to 100 nucleotides (nt). Only certain nucleotides in each aptamer sequence play a key role in the binding functionality of the aptamers. Thus, each aptamer sequence comprised of two oligonucleotide regions: essential region and non-essential region. In many cases, the non-essential region causes a reduction of binding affinity of the parent aptamer sequence. It was, therefore, necessary to identify the essential region after aptamer screenings. This work aimed to truncate the PDGF-BB aptamer. The strategy relied on analyses of the secondary structure generated by RNAstructure and mfold. Then the truncated sequences were experimentally verified their bindings by enzyme-linked immunosorbent assay (ELISA). The results indicated that RNAstructure showed the high probability for predicting the secondary structure of aptamer and the truncated 36Apt exhibited an excellent binding capability to the target comparing to the binding capability of the full-length aptamer. Within the results, the secondary structural analysis was a promising strategy not only for aptamer truncation but also for the prediction of oligonucleotide structures.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E0012 Presentation 4 (14:15~14:30)

Wall Shear Stress Distribution in Arteriovenous Graft Anastomosis Using Computational Fluid Dynamics

Sasikarn Khruasingkeaw, Yottana Khunatorn, Kittipan Rerkasame, and Tanop Srisuwan

Chiang Mai University, Thailand

Abstract—This research study about anastomosis configuration of end-to-side brachioaxillary arteriovenous graft (AV graft) by comparing flow pattern of different angles, i.e., 20°, 30°, 45°, and 90° at the anastomosis sites. The study assumption is that the angle of anastomosis relate to intimal hyperplasia at inner vessel wall. The AV graft models were constructed by Computational fluid dynamics (CFD) analysis. Since the shear stress are an initiator and modulator of intimal hyperplasia (IH). Flow pattern and corresponding wall shear stress are analyzed. The result shows that the anastomosis with small angle is more proper to use than large angle in order to reduce intimal hyperplasia at inner vessel wall which decrease the incidence of stenosis. Also the rate of AV graft reoperation will be decrease.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E0013 Presentation 5 (14:30~14:45)

Finite Element Estimation of Calcium Ions in Presence of NCX and Buffer in Astrocytes

Brajesh Kumar Jha, Amrita Jha, and Neeru Adlakha

Pandit Deendayal Petroleum University, India

Abstract—Sodium calcium exchanger (NCX) plays an effective role in signal transduction in most of the nerve cells like neuron, astrocytes etc. Sodium ion affects the cytosolic calcium concentration level in Astrocytes via various channels. Which affects the movement of the nerve impulse from one cell to other cell. In this paper two dimensional model is developed in the form of diffusion equation to study the effect of NCX in presence and absence of buffer in Astrocytes. Finite element method is employed to solve the problem and results are simulated in Matlab to estimate the affect of various parameters like flux, diffusion coefficient, buffer concentration, etc. It is observed that the effect of NCX and buffer are significant. NCX is helpful to reduce the Ca^{2+} level in cytosol. High level of buffer concentration overlaps the effect of NCX on cytosolic calcium concentration in astrocytes.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E0015 Presentation 6 (14:45~15:00)

Numerical Solution of Burgers' Equation Arising in Cytosolic Calcium Concentration Distribution

Brajesh Kumar Jha, **Ravi Borana**, Vikas Pradhan, and Manoj Mehta

Bhavan's Sheth R. A. College of Science, India

Abstract—Calcium plays pivotal role in signal transduction in many cells like neuron, astrocytes, myocytes etc. in nervous system. Free calcium ions enter into cytosol in various ways. In present study the free calcium ion transport is considered. The mathematical modeling of the phenomenon leads to a governing equation in the form of Burgers' equation. The important parameters like flux condition, diffusion coefficient, etc. have been considered. The Burgers' equation has been solved numerically. The numerical and graphical solutions have been obtained by using Crank-Nicolson finite difference scheme, matches well with the physical behavior of the phenomenon of cytosolic calcium concentration distribution. The obtained numerical results simulated in Matlab. It is observed that the applied Crank-Nicolson finite difference method is easy, efficient, reliable, and accurate.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E1001 Presentation 7 (15:00~15:15)

Dynamic Flow in the Large Airways during a Rapid Inhalation

Hadrien Calmet, Alberto Gambaruto, Guillaume Houzeaux, Alister Bates, and Denis Doorly

Barcelona Supercomputing Center, Spain

Abstract—Flow simulation in the human respiratory tract is a great challenge. A rapid and short inhalation (sniff, peak 1 ls-1) is considered here as the inflow boundary. A extensive upper airways is used, that encompass: face exterior, nasal cavity, trachea, and up to the third lung bifurcation. The simulation is carried out with a subject-specific derived from a contrast-enhanced computed tomography (CT) scan of a 48-year-old male. Unstructured mesh with finely resolved boundary layer is used and the Navier-Stokes equations are solved using a variational multi-scale method (VMS). The complex anatomy and impulsive flow conditions result in a turbulent flow, with different characteristics in the various airway partitions. Spatial and temporal discretization are at the direct numerical simulations scales. This simulation is unique thanks to the fine resolutions achieved in analyzing the upper human airways. This massive simulation is investigated with respect to turbulence power spectra, coherent structures and other measures of physiological significance. The complex anatomy and flow field are seen to perform efficient conditioning of the inspired air.

Afternoon, March 13, 2016 (Sunday)

Time: 13:30~15:30

Venue: Royal Room 1 (Level 3)

Session 2: 8 presentations-Topic: "Medical Science"

Session Chair: Prof. Chiharu Ishii

E1004 Presentation 8 (15:15~15:30)

Spatiotemporal Analysis of Brain Activity Response Using Near Infrared Spectroscopy

Raul Fernandez Rojas, Xu Huang, and Keng-Liang Ou

University of Canberra, Australia

Abstract—Near infrared spectroscopy (NIRS) is an optical imaging tool that provides cerebral hemodynamics in response to changes in neural activity. Analysis of hemodynamic response to evoked stimulation is a research topic that tries to understand the mechanism of stimulation perception. In that context, cross correlation and optical flow were used to identify spatiotemporal features of brain activity after acupuncture stimulation in NIRS data. The results presented bilateral activations in the primary somatosensory cortex which were consistent with similar studies. The time dependent cross correlation analysis exhibited dominant channels and delays among channels that can be seen as relationships between cortical areas. The optical flow computation showed the origin of cortical activity and the spatial distribution of the evoked response in the brain cortex. This study contributes to the research field to investigate hemodynamic response in the cerebral cortex after evoked stimulation using near infrared spectroscopy.

15:30-15:55	Coffee Break

Session 3

Afternoon, March 13, 2016 (Sunday)

Time: 15:55~18:10

Venue: Royal Room 1 (Level 3)

Session 3: 9 presentations-Topic: "Environment & Food Science"

Session Chair: Prof. Ki-Hyun Kim & Prof. Somchart Chantasiriwan

C0001 Presentation 1 (15:55~16:10)

Impact of Industrial Estates on Water Resources

Richa Maheshwari and Neeru Bansal

Centre for Environmental Planning and Technology, India

Abstract—Last few decades have seen a boom in the industrial sector in India. This industrialization helped people in getting employment but we cannot underscore the pollution these industries are generating on our so called "healthy" environment. This pollution has impacted our prime natural resources like Air, Water and Land and thus has resulted in the obvious deterioration of our flora, fauna and human health. In the following paper, I have taken an industrial estate complex comprising of three industrial estates; Naroda, Odhav and Vatva, situated in one of the most polluted cities of Gujarat, Ahmedabad. The study provides an understanding of the chronology of events that took place since 1960 till 2014 within and around the three estates, assessing and evaluating the quality of water resources impacted by these industrial estates and identifying the environmental and socio-economic impacts of industrial estates on water resources. The paper ends by providing some alternative/ supplementary solution in order to enhance the quality of wastewater.

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C0003 Presentation 2 (16:10~16:25)

Structural Changes in the Kitakyushu Eco-town Initiative Based on a Multi-year Survey of Materials Flow

Tadashi Tsuruta, Yuki Honda, Atsushi Fujiyama, and **Toru Matsumoto**

University of Kitakyushu, Japan

Abstract—In this study, the change of the material flow involved in Kitakyushu Eco-town and the factor of distance according to substance are analyzed along with the result of the material flow investigation over multiple years. Furthermore, this can be deleted the rate of reduction for natural resources, the rate of usage for energy and the rate of reduction for final disposal are also analyzed. The subjects of this research are 18 enterprises located in Kitakyushu Eco-town in 2005 and 23 enterprises located in Kitakyushu Eco-town in 2010. The results show that not only material flow and haul distance but also environmental indicators were changed by companies located in Eco-town.

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C0004 Presentation 3 (16:25~16:40)

Study on Estimates of Embodied Carbon of China: Based on Input-output Analysis

Zhonglin Sheng, Yufei Xin, and Weida He

University of Science and Technology Beijing, China

Abstract—In this paper, we use input-output analysis and commodity exporting data of China during 1999-2012 to conduct an empirical study and calculate carbon embodiments in China's exporting goods. The results show that China has been exporting a large amount of carbon embodiments, and its increase of CO_2 emissions has a close relationship with its export and import, among the annual CO_2 emissions of China, about 12%-24% were caused by the demands of other countries.

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A0002 Presentation 4 (16:40~16:55)

Biodegradable Pellets Based on Poly (3-hydroxybutyrate-co-3-hydroxyvalerate) / Poly (vinyl alcohol) / Sugarcane Bagasse: Thermal and Biodegradable Properties

Jinchyau Peng, Chia-Yang Wu, Li-Jhen Jheng, and Wai-Bun Lui

National Chung Hsing University, Taiwan

Abstract—Bagasse is considered to be a by-product after milling process of sugarcane stalk. In the study, sugarcane bagasse was used as filler in the composite which based on the poly (3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) and the polyvinyl alcohol (PVOH). A three-variable and three-level experimental design, including the levels of sugarcane bagasse content, the levels of maleic anhydride contents, and screw speed, was chosen for finding out the relationship between variables and the responses. Test samples were to investigate of their thermal properties by using differential scanning calorimetry (DSC), thermogravimetric analysis and biodegradation test. The results demonstrated that the melting point (Tm) of extruded pellets ranged from 157.61 ℃-168.40 ℃ as well as the decomposition temperatures (Td) which ranged from 242.02 ℃-249.73 ℃. The melting point and decomposition temperatures of the composite have been influenced by maleic anhydride contents. In biodegradability analysis according to Chinese National Standards (CNS) 14432 regulations, the biodegradability of the extruded pellets reached 72.8% after 32 days and 83.3% after 45 days, respectively.

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A0003 Presentation 5 (16:55~17:10)

Thermal and Biodegradable Properties of the Ex-truded Poly (3-hydroxybutyrate-co-3-hydroxyvalerate) / Poly (vinyl alcohol) / Tapioca Starch Plastic Pellets

Chia Yang Wu, Jinchyau Peng, and Wai-Bun Lui

National Chung Hsing University, Taiwan

Abstract—Response surface methodology (RSM) was used to produce the biodegradable plastic pellets which were composed by the poly (3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV), the polyvinyl alcohol (PVOH), and the tapioca starch. A Box-Behnken design (BBD) was used to develop models for the objective responses. Test samples were prepared for thermal properties measurements and biodegradation test. The results demonstrated that the melting point (Tm) of extruded pellets ranged from 161.85 ℃-165.59 ℃ as well as the thermal degradation temperature (Td) which ranged from 246.3 ℃-254.89 ℃. In biodegradability analysis, i.e., based on the Chinese National Standards (CNS) 14432 regulations, the biodegradability of the extruded pellets reached 72.8% after 32 days and 83.3% after 45 days, respectively. Therefore, it could be concluded that the plastic pellets developed in this study consist of biodegradable properties and this can help to resolve the refuse reduction problem.

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A0004 Presentation 6 (17:10~17:25)

Optimization of Extrusion Conditions for Corn Extrudate Fortified with Purple Sweet Potato

Chao-Hong Wang, Niang-Huei Peng, and Jinchyau Peng

National Chung-Hsing University, Taiwan

Abstract—Response surface methodology (RSM) was used to investigate the optimum operation conditions of a single screw extruder and to analyze the effects of extrusion processing variables, including screw speed (200 - 360 rpm), purple sweet potato flour level (10 - 50%), and feed moisture contents (10 - 18%) on characteristics of the corn grit - purple sweet potato extrudates. Physical analysis were carried out for selected extrudates for radial expansion ratio, hardness, water absorption index, and color (a - value). The predicted models were adequate based on the lack-of-fit test and coefficient of determination obtained. By superimposing individual contour plots of the different responses, regions meeting the optimum conditions were also derived. The graphical optimization studies resulted in screw speed (265 - 287 rpm), purple sweet potato flour level (29.4 - 33.9%), and feed moisture contents (13.6 - 14.8%) as optimum variables to produce corn grit - purple sweet potato blend extrudate.

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A0005 Presentation 7 (17:25~17:40)

Antioxidative Properties of Extrudate Pre-Pared from Purple Sweet Potato and Corn Grit

Sheng-Chi Shen, Niang-Huei Peng, and Jinchyau Peng

National Chung Hsing University, Taiwan

Abstract—The purpose of this experiment was to determine the antioxidative properties of the extrudate of corn fortified with purple sweet potato as well as pure purple sweet potato and corn grit. Four antioxidant assays were conducted, such as 1,1-diphenyl-2-picryl-hydrazyl (DPPH) free radical scavenging effect, oxygen radical absorbance capacity (ORAC) assay, 2,2'-Azinobis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) free radical scavenging activity, and reducing power. The pure purple sweet potato flour (PSP), optimized extrudate of purple sweet potato (OPT), and corn extrudate (CE) had DPPH free radical scavenging effect of $94.45\pm0.16\%$, $57.57\pm0.21\%$, and $28.58\pm1.32\%$, respectively. The ORAC of the individual samples were PSP 45.60 ± 0.46 μmol TE/g, OPT 30.58 ± 0.31 μmol TE/g and CE 10.10 ± 0.11 μmol TE/g. The ABTS free radical scavenging effect of the individual samples were PSP $74.96\pm0.27\%$, OPT $46.89\pm0.64\%$ and CE $10.89\pm0.47\%$.The reducing power that is summarized as absorbance of the individual samples were PSP 1.82 ± 0.01, OPT 1.49 ± 0.01, and CE 1.07 ± 0.02. In general, the highest value reached in pure purple sweet potato flour whereas in optimized extrudate, and corn extrudate was the lowest ($p<0.05$). It is shown that the antioxidant activity of corn extrudate was enhanced by the addition of pure purple sweet potato flour. In addition, the obtained results demmostrated that extrusion condition had significant impact on the antioxidant activity of corn extrudate fortified with purple sweet potato flour.

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A0006 Presentation 8 (17:40~17:55)

Simulation of Quadruple-effect Evaporator with Vapor Bleeding Used for Juice Heating

Somchart Chantasiriwan

Faculty of Engineering, Thammasat University, Thailand

Abstract—Quadruple-effect evaporator is used to increase the concentration of sugar juice in a series of four pressure vessels. Vapor bled from the first three vessels is used to increase the juice temperature in juice heater to the saturation temperature at the inlet of the evaporator. This paper presents the model of heating and evaporation of sugar juice in juice heater and evaporator. The model is used to investigate how variations of surfaces in juice heater and evaporator affect the performance of the system.

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A1002 Presentation 9 (17:55~18:10)

Hypoglycemic Potential of Banana Leaves (Musa paradisiaca) in Albino Rats

Maria Patricia Silvestre and **Liwayway Acero**

Department of Natural Sciences, San Beda College, Philippines

Abstract—Banana is one of the staple fruit in the Philippines. It is a part of the major diet among Filipinos. It is grown principally for its fruit. However, the leaves are often used in the Philippines as wrapper for packed food. The medicinal use of the leaves was still unknown to many Filipinos, thus this study focuses on the potential of banana leaves in lowering blood sugar. Banana leaves were dried and turned into powder form in Albino rats. Twelve Albino rats served as experimental animals. They are randomly assigned in two groups. The first group, or treatment 1, (6 animals) as the control wherein they only fed with rat pellets and drinking water. The second group-treatment 2 served as the experimental animals where banana leaves solution was administered orally for the entire duration of the study. Initial fasting blood sugar of both treatments showed no significant result. Fasting blood sugar after three and four days of administration of the solution showed significant result. The result revealed that banana leaves has the potential for lowering blood glucose in Albino Rats. This implies that banana leaves can be used as herbal medicine to lower blood glucose.

Dinner	
18:30	**Hotel Restaurant**

One Day Visit & Tour
March 14, 2016 (Monday)
9:30-17:30

Visit Schedule:

9:30: Departure from Lobby of Hotel Royal Singapore

10:00-10:30: Visit to Centre for Translational Medicine, NUS

10:30-11:00: Visit to Department of Pharmacology, NUS

11:00-12:00: Visit to Central Library/Tour of NUS Campus by Free Internal Shuttle Bus

12:00-1:00: Have Lunch at Local Restaurant

Tour Schedule:

1:00-17:30: Center Tour of Singapore (Parliament House of Singapore—Theatres on the Bay—Merlion Park—Chinatown, Singapore—Little India)

17:30: Go back Hotel Royal Singapore

NUS	Parliament House of Singapore	Theatres on the Bay
Merlion Park	Chinatown, Singapore	Little India

Conference Venue

Hotel Royal

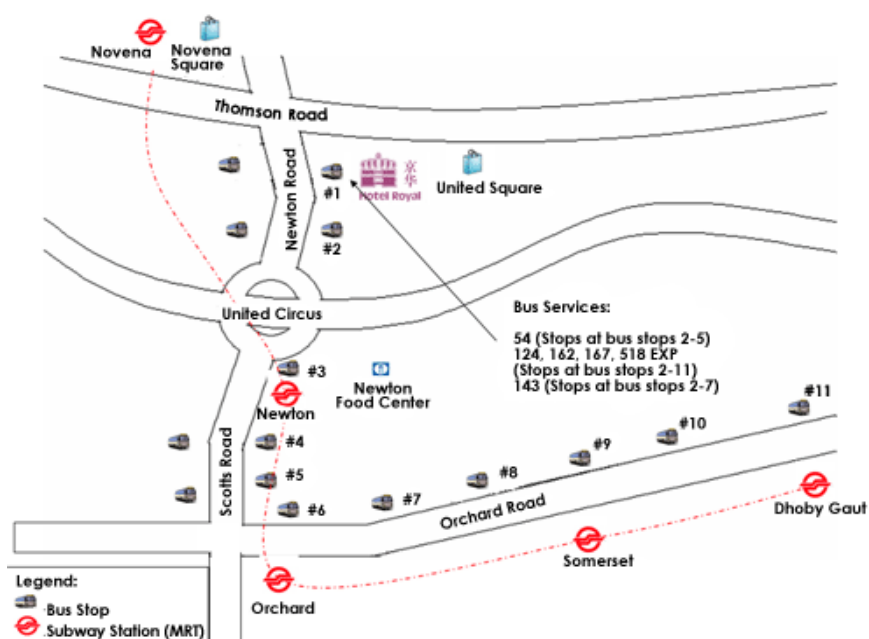http://www.hotelroyal.com.sg/about.html

Contact Method:

Email Address: Benjamin@hotelroyal.com.sg

Contact Person: Benjamin

5 minute drive to Orchard Road, shopping and entertainment paradise of Singapore. Within walking distance to 2 MRT stations (subway/underground, especially Novena MRT). Stone's throw from Newton Food Centre, where you can get excellent local food at very reasonable prices. Easy access to the National University of Singapore, Nanyang Technological University and Singapore Management University. Minutes away from Little India in Serangoon Road.

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Did the conference fulfill your reason for attending?	Yes– Absolutely ☐ Yes- But not to my full extent ☐No☐ (If "No", please tell us the main reason)
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Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs!