10th Asia-Pacific Biotech Congress

July 25-27, 2016 Bangkok, Thailand

Scientific Tracks & Abstracts

Day 1

Bio Asia-Pacific 2016

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Track 9: Nano science & Nanotechnology

Session Chair
Jagdish Singh
North Dakota State University, USA

Session Co-chair
Mohd Basyaruddin Abdul Rahman
Universiti Putra Malaysia, Malaysia

Session Introduction

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Paulo R F Rocha, Max Planck Institute for Polymer Research, Germany

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Title: **Omics approach in the study of natural hybridization in Nepenthes species**
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Hong Zhao, Wuhan University, China

Jagdish Singh et al., J Biotechnol Biomater 2016, 6:3 (Suppl)
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Molecularly modified insulin for controlled delivery from triblock copolymers

Jagdish Singh, Mayura Oak and **Divya Sharma**
North Dakota State University, USA

The objective of the present work was to develop a delivery system for controlled release of insulin at basal level based on chitosan-zinc-insulin complex incorporated into poly (lactic acid)-poly (ethylene glycol)-poly (lactic acid) (PLA-PEG-PLA, 4500 Da) thermosensitive polymer. *In vitro* release profile of insulin from the delivery system was studied in phosphate buffered saline, pH 7.4 (PBS). A significant decrease ($p<0.05$) in the initial burst was observed from the formulation containing chitosan-zinc-insulin complex compared to zinc-insulin, chitosan-insulin and insulin alone. Additionally, the release of insulin was complete with minimal secondary burst. The polymeric formulations containing chitosan-zinc-insulin complex showed a long-term controlled release (~84 days) of insulin. The *in vivo* absorption and bioactivity of insulin released from the delivery systems were studied in the streptozotocin-induced diabetic rat model. Chitosan-zinc-insulin complex significantly ($P<0.05$) reduced the initial burst release of insulin from the polymeric delivery system in comparison to zinc-insulin or insulin alone *in vivo* in rat. The delivery system released insulin for ~3 months in biologically active form with corresponding reduction in blood glucose levels in diabetic rats. The delivery systems were biocompatible both *in vitro* and *in vivo* and were non-immunogenic. The results indicate that the chitosan-zinc-insulin complex incorporated in the thermosensitive polymeric delivery system can be used as an alternative to the conventional daily basal insulin therapy.

Biography

Jagdish Singh is a Professor and Chairman of the Department of Pharmaceutical Sciences at North Dakota State University School of Pharmacy and a Fellow of American Association of Pharmaceutical Scientists (AAPS) and Fellow of Association of Biotechnology and Pharmacy. His research efforts focus on the mechanistic studies for developing and testing novel delivery technologies to deliver biotechnologically derived molecules. He has published over 170 peer-reviewed papers and 300 abstracts.

jagdish.singh@ndsu.edu

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Ultra-sensitive drug delivery platform to detect minuscule electrical activity of glioma cell populations

Paulo Roberto Ferreira da Rocha and **Dago M de Leeuw**
Max Planck Institute for Polymer Research, Germany

Detecting minuscule electrical activity of cell populations is a major challenge to electrophysiologists. To overcome such challenge, we built a highly sensitive measuring setup. The setup comprises a biosensor based on a metal/Si/SiO_2/interdigitated gold electrode. Interferences were minimized with adequate shielding. To validate the extreme sensitivity of the measuring system, we investigated the electrical activity of large populations of two cell lines known to be electrically quiescent. The cell lines studied were the human cervix carcinoma cell line, HeLa and C6 glioma cells. HeLa cells are supposed to be electrically quiet as they don't originate from the brain or any other electrically excitable tissue. However, due to the high sensitivity of our measurement system, even the HeLa cells demonstrate fluctuations of their basal current level, which is much higher in amplitude than the background acquisition noise. The low frequency analysis of the HeLa cells reveals clear current fluctuations of about 3 pA. Measurement of glioma cells subtle electrical activity is typically hampered by the high background noise. Here, we detect glioma electrical behavior without any physical disruption or interference into their physiology. The current noise analysis, performed with the sensing system determined that the glioma cell activity is primarily caused by the opening of voltage gated Na^+ and K^+ ion channels and can be efficiently abolished using specific pharmacological inhibitors. We present here a unique tool to study the electrophysiological properties of large cell populations as an *in vitro* reference for tumor bulks *in vivo*.

Biography

Paulo Roberto Ferreira da Rocha has completed his PhD from University of Algarve, Portugal, in 2014. Since 2014, he has been a Postdoctoral Researcher at Max Planck Institute for Polymer Research in Mainz, Germany.

paulorfdrocha@gmail.com

Notes:

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Murine models of dengue and their utility for drug and vaccine testing

Alonso Sylvie
National University of Singapore, Singapore

Dengue (DEN), the most serious arthropod-borne viral disease, manifests as a mild febrile illness to life-threatening hemorrhage and vascular leakage. The development of an animal model has long been recognized as a major roadblock in understanding dengue pathogenesis and validating therapeutic and prophylactic strategies prior to clinical stages. Humans and mosquitoes are the natural hosts for dengue virus (DENV) in its urban cycle. While most immunocompetent mice are not susceptible to infection from all four DENV serotypes, type I & II interferon deficient mice may develop asymptomatic transient viremia and in few cases, relevant clinical manifestations. Furthermore, it is possible to reproduce the antibody-dependent enhancement of disease severity (ADE) in this mouse model. In this conference, we will present the various mouse models of dengue currently available in our laboratory, ranging from asymptomatic transient viremia to lethal models associated with vascular leakage or liver damage, two relevant clinical manifestations. We will also present our unique models of ADE mediated by maternal antibodies acquired during both gestation and breastfeeding. This mouse models platform has made our group visible to the Dengue research scene and has attracted a significant number of collaborations, licensing and research service contracts with both industry partners and public institutions for evaluating the *in vivo* efficacy of prophylactic and therapeutic candidates.

Biography

Alonso Sylvie has completed her PhD in University Claude Bernard Lyon I, France and pursued her Postdoctoral studies at the Pasteur Institute of Lille, France and Cornell University, NY, USA. She has established laboratory at NUS, Department of Microbiology and Immunology. She is also a Member of the Immunology program at the Life Sciences Institute, NUS. Her main interests lie in host-pathogen interactions with a focus on Dengue, Tuberculosis and Enterovirus 71. She has published more than 60 peer-reviewed papers in reputed journals and has been serving as an Editorial Board Member of PLOS ONE and Frontiers in *Immunotherapies and Vaccines*.

sylvie_alonso@nuhs.edu.sg

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Downsizing antifreeze proteins to antifreeze peptides from Antarctica inhabitants

Mohd Basyaruddin, Abdul Rahman and **Azren Aida Asmawi**
Universiti Putra Malaysia, Malaysia

Some cold-adapted organisms are able to synthesize antifreeze protein (AFP) to enable them to survive in subzero environment. The ability of AFP to reduce the ice damage in cells has attracted interest in many applications for example medical and agriculture sectors. However, high capital cost in producing AFP may hamper them to be resourcefully used in industrial biotechnology. Lately, peptides that mimic the parent proteins have been designed and synthesized for many purposes. AFP type I from Antarctic yeast *Glaciozyma antarctica* and shorthorn sculpin fish, *Myoxocephalus scorpius* were downsized to functional several α-helix antifreeze peptides. The short peptide segments derived from both AFPs gave high antifreeze activity and ice recrystallization inhibition. Molecular modeling ofα-helix antifreeze peptides on ice surface showed the straightforwardness of the peptides is related to the high antifreeze activity. These synthetic antifreeze peptides could be a new hope in food preservation and cryopreservation technology as it could inhibit the growth of ice crystals.

Biography

Mohd Basyaruddin Abdul Rahman is currently the Professor of Chemistry at Universiti Putra Malaysia. He has received his PhD in Catalysis Chemistry in 1999 at the University of Southampton, England. He has developed skills in catalysis at synchrotron radiation in Daresbury and Grenoble, Protein Engineering at Osaka University and Structural Biology at the University of Edinburgh. His research areas include biocatalysis, protein chemistry, nanobiotechnology and computational chemistry. He is among the pioneer Chemists in this country to synergize experimental results with theoretical insights. He has published more than 170 cited papers and 300 proceedings in the wide field of biocatalysis. To date, he has filed more than 20 patent applications in Malaysia and 10 internationally. He has supervised and co-supervised more than 30 PhD and 35 MSc postgraduate students. He has won Young Scientist recognition from various bodies including ACS, IUPAC and IAP. He is currently the Founding Chairman of the Young Scientists Network and also being elected as the Fellow of the Academy of Sciences Malaysia.

basya@upm.edu.my

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Targeted inhibition of transcription factor STAT3 for the prevention and treatment of cancer

Gautam Sethi
National University of Singapore, Singapore

STATs comprise a family of cytoplasmic transcription factors that transmit signals, mediate intracellular signaling usually generated at cell surface receptors and transmitted to the nucleus. Numerous studies have demonstrated constitutive activation of STAT3 in a wide variety of human tumors, including blood malignancies (leukemias, lymphomas and multiple myeloma) as well as solid tissues (such as head and neck, breast, lung, gastric, hepatocellular and prostate cancers). There is a strong evidence to suggest that aberrant STAT3 signaling promotes development and progression of human cancers by either inhibiting apoptosis or inducing cell proliferation, angiogenesis, invasion and metastasis. However, the development of novel drugs for the targeting STAT3 that is both safe and efficacious remains an important scientific and clinical challenge. We will present the data that shows that novel small molecule inhibitors of STAT3/JAK2 pathway can suppress the expression of genes involved in cancer initiation and promotion both *in vitro* and *in vivo*.

Biography

Gautam Sethi has completed his Postdoctoral training at University of Texas MD Anderson Cancer Center and joined Department of Pharmacology, Yong Loo Lin School of Medicine, National University of Singapore in 2008 as an Assistant Professor and was promoted to Associate Professor in 2015. The focus of his research over the past few years has been to elucidate the mechanisms of activation of oncogenic transcription factors such as NF-kB/STAT3 by carcinogens and inflammatory agents and the identification of novel inhibitors of these proteins for prevention of and therapy for cancer. From traditional Chinese and Indian medicinal plants, his group has identified numerous small molecules that can suppress various pro-tumorigenic signaling cascades involved in cancer initiation and promotion. The novel findings of his research work have so far resulted in more than one fifty scientific publications in high impact factor peer-reviewed journals and several international awards. He currently serves as an Academic Editor for prestigious PLOS ONE journal and ad-hoc Reviewer for several other international journals.

gautam_sethi@nuhs.edu.sg

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In silico, in vitro and cytotoxicity investigations of biphenylalanine and its derivatives as potential HIV-1 gp120 attachment inhibitors

Teow Chong Teoh, Hussin A Rothan, Mohammed Rizman Idid and **Md Arman Hossain**
University of Malaya, Malaysia

In this study, molecular modeling and docking of gp120-CD4 protein complex crystal structure (PDBID: 1g9n) was used to design a novel attachment inhibitor, biphenylalanine and its derivatives (BPAs) that target HIV-1 gp120 and prevent its binding to CD4 on host cell. Molecular docking results by AutoDock Vina showed that L-biphenylalanine has highest binding probability than D-biphenylalanine and L-methyl-biphenylalanine and exhibited low negative docked energy. The CD4 capture ELISA experiments indicated that L-biphenylalanine has an IC_{50} at 200 μM. BPAs were non-toxic up to 400 μM in the Vero cell cytotoxicity test. In addition, BPAs fulfill "the Lipinski rule of five" criteria as good drug candidates.

Biography

Teow Chong Teoh is currently a Senior Lecturer of Bioinformatics program, Institute of Biological Sciences, Faculty of Science, Malaysia. He has obtained his BSc and MSc degrees in Biochemistry and PhD degree in Computational Chemistry from University of Malaya. He has 10 years of research experience in molecular modeling and simulation for chemical and biological systems. He has published numerous ISI/WOS journals, presented research papers in conferences and is holding the Chinese and US patents and has reviewed a number of research manuscripts. He has received research grants from University of Malaya and Malaysian Government for his research projects. He is also the Secretary of Malaysian Society of Marine Sciences.

ttchong@um.edu.my

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Omics approach in the study of natural hybridization in Nepenthes species

Hoe-Han Goh, Muhammad Mu'izzuddin Zulkapli and **Wan Mohd Aizat Wan Kamaruddin**
Universiti Kebangsaan Malaysia, Malaysia

The *Nepenthes* genus consists of carnivorous plants that have evolved intricate pitcher formation at the tip of their leaves for nutrient acquisition from insect trapping. Previous studies reported several proteins present in the pitcher fluid, including aspartic proteases (nepenthesin I and II) and pathogenesis related proteins (β-1, 3-glucanase, class IV chitinase and thaumatin like protein) which are enzymatically stable albeit exposed to external environment. We are interested in understanding the effect of natural hybridization on the expression of enzymes in the pitcher fluids of Nepenthes. *N. ampullaria*, *N. rafflesiana* and their natural hybrid, *Nepenthes* x *hookeriana* were chosen as the model due to the distinct feeding habits of *N. ampullaria* as a detritivore which feeds on leaf litter, while *N. rafflesiana* and *Nepenthes* x *hookeriana* remain carnivorous. To identify novel proteins in the pitcher fluids will require transcript information for the inference of peptide sequences through proteomics informed by transcriptomics (PIT) approach. PacBio isoform sequencing (Iso-Seq) provides unprecedented full length transcriptome profiles of all three species as reference databases for protein identification. Comparative transcriptomic analysis was performed through orthologous clustering of predicted peptide sequences. The hybrid, *Nepenthes* x *hookeriana* has the highest number of predicted proteins, whereby more proteins were shared with *N. rafflesiana* than *N. ampullaria*. This is consistent with previous genetic study and morphological observation. We are currently investigating allele specific gene expression and whether novel transcripts are generated as a consequence of hybridization.

Biography

Hoe-Han Goh was graduated from the University of Sheffield, UK. He has started his first academic position at the Institute of Systems Biology, Universiti Kebangsaan (National University) Malaysia in Nov 2011. He has trained himself on the applications of NGS by attending courses and workshops on NGS data analysis held at BGI-Shenzhen and TGAC UK. Since then, he has established a plant functional genomics research group with a focus on crop improvement and molecular exploration of tropical plant species using NGS and functional genomics approaches. In Jun 2014, he was appointed as Head of Plant Biotechnology Centre.

gohhh@ukm.edu.my

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2Gy, 6Gy, 8Gy, 10Gy may be some ideal fractional doses with the better biological response

Hong Zhao, Fuxiang Zhou and **Yunfeng Zhou**
Wuhan University, China

Objective: To study the radiation response of the cancer cells to different fractional dose irradiation and explore the ideal fractional dose.

Methods: Observe the variability of cell cycle, cell proliferation, apoptosis, DNA damage and repair and the expression of related proteins of human breast cancer cell line MDA-MB-435 which was administrated by different dose of X-ray irradiation (0Gy, 2Gy, 4Gy, 6Gy, 8Gy, 10Gy, 12.5Gy, 15Gy, 20Gy). Flow cytometry was used to observe the rate of apoptosis and cell cycle arrest, CCK8 method and colony formation assay were used to examine cell proliferation, the expression of DNA damage and repair and other related proteins were detected with western blotting.

Results: The apoptosis of cell, G2/M phase proportion and the inhibition of cell proliferation were increased after irradiation with the increment of the exposure dose; those changes had an obvious increasing trend. The expression of apoptosis suppression protein Bcl-2 was decreased after different dose of irradiation. On the contrary, the apoptosis related protein Bax, Caspase-9 and BID were elevated after irradiation compared to control group (0Gy), the expression of Bax in groups 6Gy, 8Gy, 10Gy, 12.5Gy, 15Gy were significant higher than those in other groups, the expression of Caspase-9 were higher in the groups 2Gy, 4Gy, 6Gy, 8Gy than other groups, the expression of BID in the groups 2Gy, 4Gy, 6Gy were higher than others. G2/M phase arrest was related to the increase of ATR/ATM AND the reduction of CHK1, CyclinB1 and CDC25B. DNA damage and repair related protein Ku80 was increased after the irradiation in the groups 2Gy, 4Gy, 10Gy,15Gy, 20Gy compared to control group, in contrast, the expression of it was decreased in the groups 6Gy, 8Gy, 12.5Gy. The expression of the Rad51 was increased after irradiation but the level of the groups 2Gy, 8Gy, 10Gy were lower than that of other groups.

Conclusion: X-ray irradiation will increase cell apoptosis, make cell block in G2/M phase and decrease the cell proliferation. But we can come to the conclusion that 2Gy, 6Gy, 8Gy and 10Gy may be the ideal fractional dose, as those can promote cell apoptosis, leads to DNA damage and inhibit its repair.

Biography

Hong Zhao is currently a MD student of the Department of Radiation and Medical Oncology, Zhongnan Hospital, Wuhan University. She has completed her Master's degree from the same department and has published 1 paper as co-author in reputed journal. Her major fields of interest are metabolomics and radiosensitivity of cancer.

vivisugar@foxmail.com

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Tracks: 4 & 8

Track 4: Medical Biotechnology
Track 8: Agricultural Biotechnology

Session Chair
Petr Malý
BIOCEV Research Center, Czech Republic

Session Co-chair
Lei Yang
Wuhan University, China

Session Introduction

Title: **Biotech and innovative breeding for the new Agri-Food System CGIAR Research Programs (CRPs)**
Philippe. Ellul, Agropolis International, France

Title: **Targeting IL-23/Th17 pro-inflammatory axis by novel non-immunoglobulin protein binders with an immunosuppressive potential**
Petr Malý, Institute of Biotechnology CAS, BIOCEV Research Center, Czech Republic

Title: **Applications of stem cell therapy in regenerative medicine in Asian countries**
Kampon Sriwatanakul, Asian Institute of Regenerative Medicine, Thailand

Title: **Genetic engineering for sustainable improvement of oil palm**
Ahmad Parveez Ghulam Kadir, Malaysian Palm Oil Board, Malaysia

Title: **Suppression of TPP1 resulted in telomere dysfunction and enhanced radiosensitivity in cancer cells regardless of telomerase status**
Lei Yang, Wuhan University, China

Title: **Effects of low level laser (diode 830 nm) therapy (LLLT) on human bone regeneration**
Mohammad Nazrul Islam, Shaheed Suhrawardy Medical College Hospital, Bangladesh

Title: **Glucose metabolism related enzymes may become some ideal targets to increase radiosensitivity of cancer cell**
Hong Zhao, Wuhan University, China

Title: **VCPA, a novel synthetic derivative based on α-tocopheryl succinate, sensitize gastric cancer cells to doxorubicin-induced apoptosis via the mitochondrial pathway**
Han Wu, Zhongnan Hospital of Wuhan University, China

Title: **UBE2D3 gene overexpression increases radiosensitivity of EC109 esophageal cancer cells**
Xiaojia Gao, Zhongnan Hospital of Wuhan University, China

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Biotech and innovative breeding for the new Agri-Food System CGIAR Research Programs (CRPs)

Philippe Ellul, P Gardiner and **W Powell**
Agropolis International, France

CGIAR's mission is to design and apply innovative science to convert the 21st century's grand challenges into prosperous and more equitable opportunities for people of the developing world. Food and nutrition security, biodiversity, climate change, natural resources management are globally identified (G20) as strategic priorities for both developed and developing countries. With its 15 research Centers (IRRI, CIMMYT, CIAT, CIP, etc...) collaborating in 12 CGIAR Research Programs (CRPs) and 3 platforms (Genebank, Big Data & Genetic Gain), CGIAR is involved in a reform process initiated in 2008 and entering in phase 2 for 2017-22 (Strategic Research Framework, 2015). Eight of the new CRPs are Agri-Food System programs involved in the improvement of staple crops (maize, wheat, rice, potato, *Sorghum*, etc...), livestock and fish. Most of these programs are collaborating in South Asian integration countries for increased impact. These programs are engaged in genomic analysis as maize and wheat with the seed of discovery project, RICE collaborating with CAAS and BGI for re-sequencing 3,000 lines of rice (and very soon 10,000) or RTB (Root Tubers and Banana) re-sequencing 1,200 cassava accessions. Accurate prediction of phenotype from genotype through genomics-assisted breeding is now feasible in crops or livestock. Millions of genotyping data are produced in high throughput genotyping platforms and used by pre-breeders in parallel with the breeding information phenotyping and field trials necessarily compiled in a modern and standardized breeding management system. Innovative computational methods are being designed and shared to support the management, collation, curation, visualization and analysis of multivariate, complex data sets to improve the identification of causative connections between genotype and phenotype and between phenotype and landscape. For rice agro-ecosystems, emerging concepts and technologies will form a key flagship (FP5) of the new RICE AFS full proposal aiming to accelerate genetic gain by capitalizing on breeding material, knowledge, and tools developed from in a first phase (GRiSP 2011-16). Novel biotech approaches including genome editing and blue-sky research such as systems biology and C4 rice project for developing a rice plant switched to C4 photosynthetic engine and adapted anatomical attributes, will be implemented. Analytical pipelines are being developed through Centers and CRP partnerships such as the Genetic Gains platform and the Genomic and Open-source Breeding Informatics Initiative (GOBII) to accelerate genetic gain. An emerging related-issue is the human capacity to design and implement such innovative approaches. Pre-breeders skilled in quantitative genetics, mapping analysis, genomics, biotechnology or breeding populations design are being trained and incorporated into the new AFS programs. We will describe how CGIAR breeding programs are evolving to deliver multiple benefits based on diverse biotech innovations.

Biography

Philippe Ellul holds a PhD in Plant Biotechnology from the University Polytechnic of Valencia, Spain. As a Researcher, he was involved in EU and Spanish national and regional projects (1997-2005) focused on vegetables' improvement for developing crops with increased salt and drought tolerance, resistance to biotic stresses, modified architecture, parthenocarpic or long shelf life fruits. As an Assistant Professor, he taught genetics, plant biotech & breeding and supervised master's degree and PhD theses for agricultural engineers in Spain, Colombia, Brazil and Ecuador. He has worked for the private sector (2005-13) managing international R&D collaborations and designing innovative approaches combining genomics, molecular and cellular biology to support breeding programs. He has joined CGIAR in 2013 and is actively involved in the monitoring of the programs and the design of the second portfolio (2017-22). He has published international papers and patents.

p.ellul@cgiar.org

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Targeting IL-23/Th17 pro-inflammatory axis by novel non-immunoglobulin protein binders with an immunosuppressive potential

Petr Maly
Institute of Biotechnology of the CAS, v.v.i., BIOCEV Research Center, Czech Republic

IL-23 receptor-mediated signaling has recently been closely associated with development of several chronic autoimmune diseases such as psoriasis, psoriatic arthritis, inflammatory bowel disease and multiple sclerosis. Recently we generated novel IL-23 receptor antagonists (called REX ligands) derived from scaffold of albumin-binding domain (ABD) that exhibited immunosuppressive control over IL-23-driven ex vivo expansion of primary human Th-17+ T-cells. Due to small size, excellent tissue penetration and self-refolding activity, these binders represent a valuable non-immunoglobulin alternative for development of topically-administrated anti-psoriatic biologicals. As the structure of IL-23/IL-23R complex is unavailable and a precise mode of interaction remains unknown, designing more efficient IL-23 inhibitors is cumbersome. Following our concept, we generated a novel class of binding proteins targeting p19 subunit of human IL-23 cytokine. These unique proteins, called ILP binders, were selected from high-complex ABD-derived combinatorial library in combination with ribosome display. From 214 clones analyzed by ELISA, Western blot and DNA sequencing, 53 provided 35 different sequence variants that were further characterized. Using *in silico* docking in combination with cell-surface competition binding assay we identified a group of inhibitory candidates that substantially diminished binding of recombinant p19 to the IL-23 receptor on human monocytic THP-1 cells. Several found p19-blocking variants inhibited IL-23-driven expansion of IL-17-producing primary human CD4+ T-cells. Thus, these novel binders represent unique IL-23-targeted probes useful for IL-23/IL-23R epitope mapping studies and could be used for designing novel p19/IL-23-targeted anti-inflammatory biologics.

Biography

Petr Maly is the Head of Laboratory of Ligand Engineering at the Institute of Biotechnology, Czech Academy of Sciences in Vestec near Prague, Czech Republic. He has studied at the Department of Biochemistry, Faculty of Science, Charles University in Prague and completed his Doctorate at the Institute of Molecular Genetics, ASCR in Prague. He has completed his Postdoctoral fellowship at the Department of Pathology and Howard Hughes Medical Institute, The University of Michigan Medical School, USA, in the laboratory of Professor John B. Lowe where he has published several substantial papers related to *in vivo* role of mammalian glycosyltransferases. Since 1998 to 2005 he was a Research Group Leader at the Institute of Molecular Genetics in Prague. He has also worked as Visiting Scientist at the Department of Biochemistry and Molecular Biology of Oklahoma Center for Medical Glycobiology, College of Medicine, the University of Oklahoma, USA. He was a Participating Investigator of Consortium for Functional Glycomics, USA (2001-2008) and Member of Editorial Board (2001-2005) and Editor (since 2003) of the Czech Journal *"Biologicke listy"*. Since 2008, he has been working on development of combinatorial protein libraries derived from small protein scaffolds and construction of novel high-affinity protein binders with therapeutic and diagnostic potential.

petr.maly@ibt.cas.cz

Notes:

Kampon Sriwatanakul, J Biotechnol Biomater 2016, 6:3 (Suppl)
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Applications of stem cell therapy in regenerative medicine in Asian countries

Kampon Sriwatanakul
Asian Institute of Regenerative Medicine, Thailand

Stem cell therapy is an emerging form of healthcare that offers significant potential to improve the practice of medicine. Despite the large number of cell therapy are in clinical trials, relatively few have made it to the market in the United States. In Asia, Korea seems to develop cell therapy products more rapidly than other countries. In Asian countries, we attempt to promote the applications of stem cell therapy in regenerative medicine. The PRP (Platelet Rich Plasma) kit is currently in the process of seeking FDA approval as a Class II medical device. Clinical trials were conducted to demonstrate the efficacy and safety of this innovative kit in the treatments of facial rejuvenation and mild to moderate cases of knee joint osteoarthritis (OA). The results demonstrated the consistent effects in stimulating cell proliferation and tissue regeneration. There were statistically significant differences regarding the general appearance, facial skin firmness, sagging and wrinkle states before each PRP procedure and 3 months after the last PRP procedure. The intra-articular injection of hyaluronic acid (HA) plus PRP could strongly rescue the meniscus tear and cartilage breakdown. The combination of HA and PRP can synergistically promote cartilage regeneration and inhibit OA inflammation. These studies might offer advanced treatments for facial rejuvenation and alternative OA treatments based on regenerative mechanisms.

Biography

Kampon Sriwatanakul is an internationally recognized pioneer of stem cell therapy, received MD degree and PhD degree from Mahidol University where he had an academic career for more than 35 years. He has also received training in Clinical Pharmacology from University of Leicester, UK and University of Rochester, USA. Apart from publishing more than 40 publications in international journals, he has spearheaded a number of important research and development activities related to stem cell technology in Thailand, including setting up of cord blood and tooth cell banking.

drsrikul@gmail.com

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Genetic engineering for sustainable improvement of oil palm

Ahmad Parveez Ghulam Kadir, O Abdul Rasid, M Y Abdul Masani, A M Dayang Izawati, B Bahariah, M Siti Masura, A Nur Hanin, W S Wan Nur Syuhada, A R Nurfahisza, I Nor Fakhrana, F H Lim and **S Ravigadevi**
Malaysian Palm Oil Board, Malaysia

Oil palm is the most productive vegetable oil crop that can be used either as edible foodstuff or industrial feedstock. Systematic progress in conventional breeding, application of good agriculture practices among others has allowed the oil palm industry to obtain a solid footing in South East Asia, particularly in Malaysia and Indonesia. However, to remain competitive in the long term, diversification of research into profitable areas, such as palm biotechnology is a necessity. Biotechnology offers tremendous opportunities for further improvement of oil palm yields. The idea is to deploy appropriate biotechnology tools to obtain highest yielding trees, with good quality oil and minimal environmental footprint. In this regard, MPOB made a major breakthrough in sequencing the genome of oil palm, which allowed the identification of genes influencing important agronomic traits. Conversion of these discoveries into molecular diagnostic assays will also help improve breeding efficiency. Apart from conventional breeding, MPOB also has an active tissue culture program to clone the highest yielding palms. Uniformity of planting materials via cloning, offers the opportunity to increase yields up to 30%. However, abnormalities observed in a small percentage of the clones, has restricted large scale commercialization. Nonetheless, it has opened up opportunities for deciphering the epigenome of oil palm to understand molecular basis of clonal abnormality. Developing transgenic technologies has also been an important component in MPOB's R&D efforts to further diversify the use of palm oil. The main focus has been to develop high oleate oil palm for the high value oleochemical industry. Biotechnology efforts towards increasing oil palm production will contribute to world food security.

Biography

Ahmad Parveez Ghulam Kadir is the Director of Advanced Biotechnology and Breeding Centre at the Malaysian Palm Oil Board (MPOB). He has completed his PhD on Plant Genetic Engineering at the Universiti Putra Malaysia under Asian Development Bank's Scholarship. He was also appointed by the Honorable Minister of Natural Resources and Environment of Malaysia to Chair the Genetic Modification Advisory Committee (GMAC) under the National Biosafety Board from 25th May 2010 to 24th May 2016.

parveez@mpob.gov.my

Notes:

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Suppression of TPP1 resulted in telomere dysfunction and enhanced radiosensitivity in cancer cells regardless of telomerase status

Lei Yang[1], **Weiguang Qiang**[2] and **Yunfeng Zhou**[1]
[1]Wuhan University, China
[2]Soochow University, China

Radiotherapy is one of the major therapeutic strategies in can¬cer treatment and identifying new factors that predict radioresistance could be of great value in the treatment of cancers. Telomere homeostasis is now emerging as an effective and important factor in modulating cellular sensitivity to ionizing radiation. The telomere-binding protein TPP1, an important component of the shelterin complex at mammalian telomeres, is an important regulator of telomere homeostasis. In this study, we investigated the role of TPP1 expression in regulating cellular radiosensitivity and telomere homeostasis in both telomerase positive (HCT116) and alternative lengthening of telomere (ALT) cell lines (U2OS). We found that TPP1 deletion lead to a significant increase of radiosensitivity to X-rays in both telomerase positive (HCT116) and alternative lengthening of telomere (ALT) cell lines (U2OS). TPP1 mediated radiosensitization was correlated with increased telomere dysfunction and apoptosis rate after IR exposure. Moreover, TPP1 deletion slowed down the repair kinetics of total DNA damage and telomere dysfunction induced by ionizing radiation. Together, our study demonstrated that TPP1 plays a vital role in telomere maintenance and cellular response to ionizing radiation and may be a potential target in the radiotherapy of cancer regardless of telomerase status.

Biography

Lei Yang has completed his PhD/MD in 2014 from Wuhan University, China. He has worked in the Department of Radiation Oncology & Medical Oncology at Zhongnan Hospital, Wuhan University for 1 year. His main research field is the role of telomere and telomerase in anti-cancer therapy.

yfzhouwhu@163.com

Notes:

Mohammad Nazrul Islam, J Biotechnol Biomater 2016, 6:3 (Suppl)
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Effects of low level laser (diode 830 nm) therapy (LLLT) on human bone regeneration

Mohammad Nazrul Islam
Shaheed Suhrawardy Medical College Hospital, Bangladesh

Tissue healing is a complex process that involves both local and systemic responses and the healing process of bone is much slower than that of soft tissues which is a great challenge of medical science. The use of Laser Therapy (LLLT) for wound/bone healing has been shown to be effective by modulating both local and systemic response by enhancing cellular & mitochondrial ion exchange, bone mineralization, nitric oxide formation, lymphatic circulation, osteoblast proliferation, effects on osteoblast gene expression, osteoclast inhibition (prevents bone mineral resorption) and by bone engraftment on synthetic materials. The result observed here is that the bone density in the laser treated group, at fracture site, at the end of 3rd week is equivalent to the bone density of control group at the end of 4th week of incidence. Treatment with 830 nm diode laser has substantially reduced the fracture healing time as well as improved the quality/quantity of callus formation of the patient; thus accelerates bone regeneration and enhance fracture healing. Laser biostimulative effects on bone could be a new dimension for bone regeneration which significantly reduce healing period, lessen cost of treatment and enhance patient compliance.

Biography

Mohammad Nazrul Islam has completed his MBBS degree from Dhaka University and later MSc (BME) from Gonobiswabidyalaya, Bangladesh. He is the founding Head of Biomedical and Medical Biotechnology Department of Shaheed Suhrawardy Medical College and Hospital, Bangladesh. He has published papers in reputed professional, national and international forum, journals and continues academic research work at Shaheed Suhrawardy Medical College, Institute and Hospital since 2007.

abbirr@gmail.com

Notes:

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Glucose metabolism related enzymes may become some ideal targets to increase radiosensitivity of cancer cell

Hong Zhao, Fuxiang Zhou and **Yunfeng Zhou**
Wuhan University, China

Objective: To establish a radioresistant cell line of cancer cells and investigate the proteins related to glucose metabolism and to find out the differences between them.

Methods: Established radioresistant cell line (435R) of breast cancer cell line MDA-MB-435 through exposed to continuous X-ray radiation (2Gy a day for five days a week and a total dose of 60Gy), the radiation resistance of cells was detected by colony formation assay. Enzymes that related to the glucose metabolism of the cells were detected at the level of transcription and translation levels. The changes of the metabolite concentrations were detected with the special kits.

Results: The radioresistant cell line 435R was established after continuous X-ray irradiation and validated by colony formation assay. Expression of the GLUT1 in the radioresistant cell 435R was significantly higher than that in its parental cell 435S. The glucose metabolism related enzymes PKM2, LDHA, PDHA and IDH1 in the 435R were significantly higher than those in the 435S. The ATP levels were significantly higher in 435R compared to its parental cells.

Conclusion: Glucose uptake of the radioresistant cell was increased compared to its parental cells. Aerobic glycolysis and oxidative phosphorylation in the radioresistant cell were higher than its parental cells. The glucose metabolism related enzymes may become some ideal targets of adjustment of the radiosensitivity of cancer cells.

Biography

Hong Zhao is currently a MD student of the Department of Radiation and Medical Oncology, Zhongnan Hospital, Wuhan University. She has completed her Master's degree from the same department and has published 1 paper as co-author in reputed journal. Her major fields of interest are metabolomics and radiosensitivity of cancer.

vivisugar@foxmail.com

Notes:

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VCPA, a novel synthetic derivative based on α-tocopheryl succinate, sensitize gastric cancer cells to doxorubicin-induced apoptosis via the mitochondrial pathway

Han Wu
Zhongnan Hospital of Wuhan University, China

Gastric cancer (GC) remains one of the most common malignancies, especially in East Asia. Although surgical resection is the main method in curing cancer, chemotherapy remains an important treatment to avoid tumor recurrence and metastasis. Doxorubicin (DOX) is one of the most effective and widely used chemotherapeutic agents for the treatment of various malignancies. And it is also widely used to treat GC in combination regimens with etoposide, cisplatin and 5-fluorouracil. However, the dose-dependent adverse effects significantly limit its efficacy. Previous researches demonstrated that dysregulation of apoptosis pathway is a fundamental, common aberration adapted by of most cancer cells to survive, proliferate and metastasis. Hence, we have recently proposed a novel synthetic derivative VCPA as a chemosensitive agent, which could enhance the efficacy of DOX and thereby reducing the DOX doses. GC cell lines SGC7901, AGS, MKN28 and MGC803 were used to investigate the cytotoxicity under VCPA treated. The IC50 doses for 48 hours were 19.96 uM, 10.67 uM, 11.30 uM and 14.01 uM, respectively. The inhibition of VCPA was displayed in a dose and time dependent manner. Pretreatment of GC cells with VCPA at IC50 for 24 hours significantly enhanced the inhibition of DOX both *in vitro* and *in vivo*. Even the DOX-resistant GC cells displayed apoptosis after pretreatment. This drug combination strategy caused rapid production of ROS in GC cells. And the response of GC cells to the drug correlated with induction of pro-apoptotic protein Bax, inhibition of anti-apoptotic protein Bcl-2, activation of caspase-3 and finally promoting PARP cleavage. Collectively, these results imply that VCPA, a novel synthetic derivative based on α-tocopheryl succinate, potentiates DOX induced apoptosis in GC cells and is in sight to reduce patient adverse response to DOX. One of the potential mechanisms by which the pretreated combination therapy has synergistic cytotoxic effects against gastric cancer may be through the mitochondrial apoptosis pathway.

Biography

Han Wu is currently pursuing her PhD from Zhongnan Hospital of Wuhan University, Wuhan, China. She has completed her MD in Oncology from the Second Military Medical University, Shanghai, China. She has performed studied on primary hepatocyte isolation and culture, establishment of liver disease model such as DEN-induced hepatocellular carcinogenesis in mouse and rat, DMN-induced acute hepatic failure in rat and tumor metabolism. She has successfully applied for the National Natural Science Foundation of China grant (NO: 31371440) as the principle person. Presently her main research field is the drug resistant in abdominal tumors. She has published two papers as co-author in reputed journals.

wuhan_whu@163.com

Notes:

Xiaojia Gao et al., J Biotechnol Biomater 2016, 6:3 (Suppl)
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UBE2D3 gene overexpression increases radiosensitivity of EC109 esophageal cancer cells

Xiaojia Gao and **Yunfeng Zhou**
Zhongnan Hospital of Wuhan University, China

Radiotherapy is widely used in adjuvant approaches for esophageal cancer (EsC) to reduce local recurrence and improve survival. However, the overall 5-year survival was about 17% over the past few decades. Therefore, find an effective way to improve the effect of radiotherapy is vital. We have been engaged in this work for 15 years. Not only radiosensitivity is associated with a collection of associated proteins and telomere, we found, but also telomerase. Telomerase is, furthermore, regulated by post-translational modifications of the rate limiting catalytic subunit hTERT. We had used yeast two-hybrid method to identify UBE2D3 encoding an E2 ligase which is a principle hTERT-interacting protein and inhibition of UBE2D3 expression attenuates radiosensitivity of MCF-7 human breast cancer cells by increasing hTERT expression and activity and we found that UBE2D3 is negatively correlated with hTERT expression and is a positive prognostic factor in EsC. To verify a possible contribution of UBE2D3 to tumor cell radiosensitivity, esophageal squamous carcinoma cells (EC109 cells) were transfected with the expression plasmid encoding UBE2D3 and stable transfectants were subsequently established. UBE2D3-overexpressing cells exhibited an increased incorporation of radiosensitivity, to further investigate the mechanism; the CCK-8 assay was used to confirm cell proliferation, which showed that UBE2D3 downgrades EC109 cells propagation. Moreover, cell cycle distribution was examined by flow cytometry, UBE2D3 overexpression in EC109 cells causes prolonged G1 arrest after IR exposure on the contrary G2/M shortened. We, then, detected the protein expression about ATM/ATR-Chk2 pathway by western blotting, which in UBE2D3 over-expressing cells showed decrease after irradiation. And overexpression of UBE2D3 decreases the protein level of hTERT relative to the control cell line. Subsequently, we immunoprecipitated with anti-hTERT antibody followed by immunoblotting with anti-ubquitin antibody to examine the *in vivo* role of UBE2D3 in ubiquitination of hTERT. Overexpression of UBE2D3 caused a clear and dramatic increase in the amount of ubiquitinated hTERT species after 2 hours of specific proteasome inhibitor MG132 treatment, which points out hTERT may be degraded by the proteasome pathway. To determine whether this change can influence the telomere length, we used real-time PCR to test the relative telomere length and result suggests that overexpressed UBE2D3 is negative correlation with telomere extension. In conclusion, these findings suggest that UBE2D3 may be a potential target in the radiotherapy of EsC.

Biography

Xiaojia Gao has completed his Bachelor's degree from Hubei University of Traditional Chinese Medicine in 2013. He is currently pursuing his Master's degree in radiation-guided gene therapy of cancer at Wuhan University, China. He has published 2 papers in national journals and presented results of his research at a national conference.

yfzhouwhu@163.com

Notes:

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July 25-27, 2016 Bangkok, Thailand

Workshop

Day 2

Workshop on Stem Cell Technology

Day 2 July 26, 2016

Asean Society of Regenerative Medicine, Thailand

Session Introduction

Title: **Introduction**

Dr. Vichit Punyahotra, Senior Lecturer of School of Anti Aging and Regenerative Medicine, Thailand

Title: **Update on stem cell biology**

Petcharin Srivatanakul, Laboratory Director of Bio MSC Co., Ltd., Thailand

Soontaree Petchdee, Department of Large Animal and wildlife Clinical, Sciences, Faculty of Veterinary Medicine, Kasetsart University, Thailand

Title: **Application of immune cell-based therapy for cancer and aging**

Bor-Yu Tsai, NAVI BioTheraputics, Inc

Title: **Growth factor complex**

Win-Ping Deng, Director of Stem Cell Research Center of Taipei Medical University, Taiwan

Title: **Basic concept of biology medicine**

William van Ewijk, Director of Placenta Research Foundation, Netherlands

Peter Klaus Cremer, Edith-liebergeal-institut, Germany

Title: **Regenerative medicine in clinical practice**

Daryl Turner, World Authority and Specialist in Thyroid symptoms And Treatment

Viroj Vong, American Board of Hair Restoration Surgery, USA

Surachai Liamthong, President of VitaStem Co,.Ltd.,Thailand

Soontaree Petchdee, J Biotechnol Biomater 2016, 6:3 (Suppl)
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Therapeutic applications of dental pulp stem cells in veterinary medicine

Soontaree Petchdee
Kasetsart University, Faculty of Veterinary Medicine, Thailand

Stem cells treatment has been a considerable research interest over the last decade. Several stem cell types have been studied as the possible candidates to restore the structure and function of damaged tissues and organs. The dental pulp stem cells (DPSCs) have shown potential for their use as an alternative resource in regenerative medicine. DPSCs have mesenchymal stem cell-like (MSC) qualities, including the capacity for self-renewal and multi-lineage differentiation potential. In this study, we demonstrate the potential applications of DPSCs as a tool to repair damaged tissues and organs. Diseases related to chronic inflammation such as ischemic heart diseases, osteoarthritis, tendonitis, ocular injury and chronic wounds have been investigated through experimental and clinical trial design to clarify the use of DPSCs treatments. Transplantation of DPSCs provided a good option in terms of tissue regeneration and remodelling. This study suggested that DPSCs might provide a new perspective for translational medicine. However, important points in DPSCs biology, such as homing and immune-regulation require further study of underlying mechanisms to support the application of DPSCs in the future.

Biography

Petchdee has completed her PhD from University of Glasgow at 2009. She later worked as a lecturer at faculty of veterinary medicine, Kasetsart University. She has published more than 10 papers in reputed journals and has been an editorial board member of many reputed journals.

Notes:

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Growth factor complex

Win-Pin Deng[1] and **Kampon Sriwatanakul**[2]
[1]Taipei Medical University, Taiwan
[2]Asean Society of Regenerative Medicine, Thailand

There have been enough published evidences suggesting that beneficial effect of stem cell may not be restricted to cell or tissue regeneration alone, but also due to their paracrine effects. Stem cells can secrete potent combination of trophic factors that mediate the molecular composition of the environment to elicit responses from resident cells. The trophic factors secreted by stem cell are usually known as growth factors and cytokines. Growth factor is a naturally occurring substance capable of stimulating cellular growth, cell proliferation, tissue healing and cellular differentiation. They are very important for signaling a variety of cellular processes. For more than 20 years, growth factors have been used in the treatments of blood diseases and cardiovascular diseases. These include platelet-derived growth factor (PDGF), transforming growth factor (TGF), tumor necrosis factor alpha (TNF alpha) and vascular endothelial growth factor (VEGF). Platelets also contain growth factors that are responsible for stimulating tissue regeneration, repairing damage tissues and stimulation of the wound healing processes as well. Platelets also release large amount of growth factors including PDGF, VEGF, TGF, epithelial growth factor (EGF) and fibroblast growth factor (FGF). Cytokines and chemokines are small proteins secreted by many cell types. They are important signaling messengers mediating cell communication and activating other cells through binding to specific receptors. Cytokines also play an important role in the immune system, in which the chemokines mainly function as chemo attractants. They also coordinate and regulate the biological processes such as cell growth and tissue repair. Our growth factor complex (GFC) in combination of tissue engineering has been developed as the innovative medical device. The goal of tissue engineering is to assemble functional constituents that restore, maintain or improve damaged tissues and organs. The system consists of GMP grade centrifuge and second-generation platelet-rich plasma (PRP) collection tubes. In this presentation, clinical studies aiming to assess the efficacy and safety of this innovative device for the treatments of low back pain and osteoarthritis are being reported. Rapid pain relief (within one week) was being achieved in more than 85% of the tested subjects. Decreased pain and improved function were also reported by most patients. No significant adverse effects were being reported. We are conducting further studies in sport injuries, in the aesthetic applications and the treatments of diabetic wounds. The results of these pilot studies are very encouraging. We believe that GFC medical device is a revolutionary and non-invasive treatment that uses the patients' blood samples to stimulate the natural healing process for a variety of orthopedic conditions and athletic injuries.

Biography

Win-Ping Deng obtained the doctorate in cancer biology at the Harvard University in 1993. In 2000, he joined the Faculty of Oral Medicine at the Taipei Medical University where now he is the Director of Stem Cell Research Center. Dr. Deng pioneered a new research for combining stem cell and molecular imaging to study the cancer therapy and tissue regeneration.

Notes:

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Regenerative medicine in clinical practice

Tom Kho and **Kampon Sriwatanakul**
Asian Society of Regenerative Medicine, Thailand

Regenerative technologies to boost up innate repair processes and restore damage organs and tissues is becoming a new era in health care. A regenerative medicine model would consist of scalable production and standardized applications of clinical grade biotherapies. Regenerative medicine aims to offer solutions for many incurable diseases. The need for innovative technology is due to the rising number of chronic diseases afflicting an aging global population. It has been estimated that by 2020 chronic diseases in particularly cardiovascular diseases, diabetes, brain diseases, respiratory conditions and cancers will cause more than 70% of all death globally. People over 60 years-old will suffer from disabilities ranging from visual and hearing loss, dementia or osteoarthritis. There are several methods employed in regenerative medicine. These technologies may incorporate stem cell transplantations, tissue engineering and uses of growth factors and appropriate cytokines. Our current approaches employ platelet rich plasma (PRP), growth factor complex, autologous stem cell therapy and immunotherapy for rejuvenation, aesthetic applications and for the treatments of osteoarthritis, sport injuries and diabetic wounds. The allogeneic mesenchymal stem cell (MSC) therapy can be given intravenously and home to sites of tissue injury and can accelerate the tissue repair processes. Several clinical trials and ongoing studies indicated their potential uses in various degenerative diseases. During the last decade, many published data suggest that MSCs possess the innate capacity to home to site of inflammation, including tumor microenvironments. This homing response can be applied by using MSCs a cellular delivery vehicle to deliver anti-cancer agent directly to tumor. Stem cell function declines with age in both human and experimental animals. Aging leads to functional decline of hematopoietic stem cells, including alterations of self-renewal and cell differentiation. It has been hypothesized that aging of stem cell is the underlying cause of impaired tissue homeostasis as well as cancers in aged individuals. Recently, the aspect of aging of the stem cell niche on altered phenotypes associated with aged stem cell is more clearly understood. New data were presented on the role of sestins in regulating metabolism and therefore the development of aging-related pathologies. Different status of metabolism of the cell and its niche could lead to activation or inactivation of the signaling pathways of metabolism and consequently influence cell fate regulation. More evidences indicate that stem cells have distinct metabolism compared to differentiated cell and the unique metabolism property of stem cell is important for their maintenance. It is of great significance for studies of energy metabolism in aging as well as carcinogenesis. The interactions between telomeres, telomerase, DNA damage response and senescence as well as their relations to cancer and aging are also needed to be explored much further.

Biography

Tom Kho is a leading stem cell researcher especially in the field of mesenchymal stem cell technology. He has developed sevrral innovative stem cell products currently available in the global market. He has contributed significantly to several research and development projects currently on going in Thailand.

drsrikul@gmail.com

Notes:

Petcharin Srivatanakul, J Biotechnol Biomater 2016, 6:3 (Suppl)
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Update on stem cells biology

Petcharin Srivatanakul
Bio MSC Co. Ltd., Thailand

Stem cells are special type of cells, which can be found almost in each type of tissue and through entire life span in multicellular organism. Their main functions are to provide tissue development, homeostasis and reparation of tissue damage. Stem cells are defined as cells that have the capacity to self-renewal, multipotency/pluripotency, clonality, and are divided into embryonic stem cells and adult stem cells. ESCs and iPSCs are very similar .Pluripotent stem cells hold great promise in the field of regenerative medicine. Because they can propagate indefinitely, as well as give rise to every other cell type in the body (such as neurons, heart, pancreatic, and liver cells), they represent a single source of cells that could be used to replace those lost to damage or disease. They have a capacity to undergo chromosomal changes and develop into cancerous cells. It has been shown that transplantation of ESCs into animal produces teratomas or teratocarcinomas. Hematopoietic stem cells (HSCs) are the stem cells that give rise to all the other blood cells through the process of haematopoiesis. They are derived from mesoderm and located in the red bone marrow.The hematopoietic tissue contains cells with long-term and short-term regeneration capacities and committed multipotent, oligopotent, and unipotent progenitors. HSCs are a heterogeneous population. Mesenchymal Stem Cells (MSCs) are a group of adult stem cells naturally found in the body from a variety of tissues such as bone marrow, peripheral blood, umbilical cord, placenta, adipose tissue, dental pulp etc. that differentiate along several mesenchymal lineages . Adult stem cells are undifferentiated cells found in numerous tissues throughout the body that divide to replenish dying cells and regenerate damaged tissues. On the other hand, there are significant differences in the proliferation and differentiation abilities, and in harvesting procedures among these MSCs.

Notes:

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Application of immune cell-based therapy for cancer and aging

Bor-Yu Tsai
NAVI-Biotherapeutics Inc., Thailand

The immune cells play the central roles to detect and destroy abnormal cells may prevent the process of cancer and aging. Cellular senescence, a state of irreversible cell cycle arrest, can be triggered by different mechanism including oncogene activation, telomere erosion, DNA damage, oxidative stress and chemotherapy. It is well known that systemic or organ-specific accumulation of senescent cells results in aging and aging-related disease. Moreover, senescence associated with the disruption of the tissue microenvironment enhances the development of a pro-oncogenic environment, principally via the secretion of senescence-associated pro-inflammatory factors. Recent studies demonstrated that clearance of p16Ink4a-positive senescent cells delays the development of aging-associated disease. Therefore, senescent cells become an attractive target for anti-aging therapy. Both innate and adaptive immune cells have great capacity to eliminate senescent and malignant cells accumulated in tissue, organ and in peripheral circulation. Senescent cells communicate with their microenvironment by secreting many of kinds of pro-inflammatory cytokines, chemokines, growth factors and proteases. This condition is called senescence-associated secretory phenotype (SASP).The SASP recruits and activates immune cells to clear senescent cells, which may promote tissue repair and remove potentially tumorigenic factors in the body. For example, NK cells, which belong to a component of innate immune system could recognize senescent cells through NKG2D ligand-receptor interaction and utilize granule exocytosis to kill senescent cells. Induction of cellular senescence is also a therapeutic strategy in cancer treatment by applying systemic pro-senescent stress such as chemotherapy and ionizing radiation. These kinds of therapies generate persistent senescent cells that might damage surrounding tissues via the SASP and then cause long-term side effects of cancer treatment such as accelerated aging. Therefore, using immune cells that could clear senescent cells as an adjuvant therapy might have beneficial effects in cancer patients who received pro-senescent therapy.

Notes:

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Stem cells and regenerative medicine in the Asian region

Vichit Punyahotra
Mae Fah Luang University, Thailand

In the past decade, stem cell research and regenerative medicine have received much attention by research institutes and companies based in the Asian region. However, there are very few companies that can deal with global development in the biotechnology market. For the time being, government support in driving the growth of this particular industry is still limited. Private or institutional investors are not yet convinced to take a risk on a company developing a product using science that few people understand. Only a handful of countries have developed regulatory framework for regenerative medicine approval. Japan and South Korea are probably the only two countries in Asia that can offer regenerative medicine products and technologies having approval from regulatory authorities. Degenerative diseases including cardiovascular diseases, stroke, diabetes, Alzheimer's disease, liver cirrhosis, bone and joint diseases and kidney failure are difficult to treat. The existing conventional treatments are expensive and not very effective. Regenerative medicine could help cut down on the costs and provide more effective outcome. The idea behind regenerative medicine is to replace or regenerate cells or organs that have been damaged. In theory, regenerative medicine could someday grow a new liver or replace damaged brain cells, treat spinal cord injuries, heart diseases, brain diseases and more. Much of regenerative medicine relies on stem cells, which are the building blocks of organs and tissues. Stem cells and their progenitors offer great hope for treating diseases by providing an unlimited source of cells for repairing or replacing damaged tissues and organs. Hematopoietic stem cell transplantation is the application of bone marrow, peripheral blood and cord blood stem and progenitor cells in order to establish marrow and immune functions in patients with a variety of cancers and non-malignant disorders. These include leukemia, lymphoma, multiple myeloma, bone marrow failure and thalassemia. Mesenchymal stem cells (MSCs) are stromal cells that have the ability to self-renew and can differentiate into more than hundred tissues and organs. MSCs can be isolated from a small aspirate of bone marrow or adipose tissue from the patient and can be harvested from baby teeth and umbilical cord tissues. This type of stem cell is easy to be cultivated and expanded *in vitro*. They are able to moderate immune response which make them good candidate for regenerative medicine especially to be used for allogeneic transplantation. The understanding of stem cell aging in the pathological tissue and malignant tumor is highly relevant for future development in biomedicine. Moderation of physiological and pathological processes might open new perspective to restore organ function lost by disease or physical trauma or to overcome pathophysiological conditions.

Biography

Vichit Punyahotra is currently a senior lecturer of School of Anti-aging and Regenerative Medicine of Mae Fahluang University, President of Health Foundation and President of Institute of Asean Integrative Medicine. He is also an American Board certified plastic surgeon having been trained in Cornell University, U.S.A. His areas of expertise include alternative medicine, holistic medicine, anti-aging medicine and energy medicine.

Notes:

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Basic concepts of biological medicine

Peter Klaus Cremer
Edith Liebergeld Institute, Germany

Life and growth are a continuous balancing out of charges from "plus" and "minus" at the cell membrane. Everything which lives and grows is based on the so-called "Schumann resonance frequency of 7.83 Hz. Humans are embedded and fed back to the day-night rhythm, the weekly rhythm and the monthly rhythm. The circadian clock measures time in periods which are approximately 24 hours long for example during waking and sleeping. The recipient of all of these rhythms which represent a signal for the organism is the epiphysis and pituitary gland. These two endocrine glands are the main controlling organs in the human organism including the whole glands and hormone system. Both play an ever greater role today in people getting not enough sleep. The cities are illuminated too strong at night by artificial light sources, this destructive effect our health because the day-night rhythm is constantly being disturbed. Light (photons) have the effect that no further melatonin is produced so we can no longer sleep well. A chronic lack of sleep over time leads to chronic immunosuppression. This makes the basis for degenerative diseases, particularly cancer, cardiovascular diseases and depression. Human beings need 8 hours of sleep per day. There may be individual deviations amongst the population of plus or minus 2 hours per day. However, 6 hours is the absolute minimum for an adult. Cell therapy as a therapeutic concept was firstly performed by Dr. Paul Niehans, a surgeon and endocrinologist, in 1931. The so called "fresh cell therapy" involved the transfer of animal cell material into the human organism by means of an injection. One usually uses organs from sheep fetuses and from young animals. The injected organ suspension is not based on either an unspecific stimulator effect nor is based on hormones. The effect is strictly organ-specific trophotropic and is fundamentally based on substitution of cell fragments in an active form which activate the molecular repair capability. Organs consist of cells whereby every cell is a tiny organism in itself. Every one of the billions of body cells performs their metabolism according to a cybernetically controlled plan. The immediate command to do this comes from the nucleus of the cell (DNA, RNA). Embryonic stem cells or cells from young animals do not have any specific immune orientation. They do not produce any allergic reactions. However, there are also some immediate allergic reactions occurred, if an injection is made when there is a known allergic tendency. Through xenogeneic transfer of animal cell materials, the organism is persuaded to implement the biochemical life of the cells in the individual energy types. The scientific foundations of cell therapy are based on more than a thousand papers published in German literature. It is necessary to have more studies done elsewhere in order to assess the efficacy and safety of the xenogeneic stem cell transplantation.

Biography

Claus-Peter Cremer is a bio-physicist, cell therapist and head of research at Edith Liebergeld Institute, Germany. Claus-Peter Cremer had extensive studies at Gottingen and Frankfurt Institutes. His research interests range from energy medicine, cell therapy, peptide therapy and homeopathy.

Notes:

10th Asia-Pacific Biotech Congress

July 25-27, 2016 Bangkok, Thailand

Scientific Tracks & Abstracts

Day 3




Bio Asia-Pacific 2016

Tracks: 1, 6, 10, 11 & 14

Track 1:Environmental Biotechnology
Track 6: Industrial Biotechnology
Track 10: Biotechnology Applications
Track 11: Genetic Engineering
Track 14: Waste water treatment using Bio Techniques

Session Chair
Sarabjeet Singh Ahluwalia
General Shivdev Singh Dewan Gurbachan Singh Khalsa College, India

Session Co-chair
Zurina Zainal Abidin
Universiti Putra Malaysia, Malaysia

Session Introduction

Title: **Scale-up of microbial oil production using oleaginous filamentous fungi**
Zhanying Zhang, Queensland University of Technology, Australia

Title: **Decolorization of textile dyes Basic Red 46 and Reactive Black 5 by *Staphylococcus epidermidis* MTCC 10623**
Sarabjeet Singh Ahluwalia, General Shivdev Singh Dewan Gurbachan Singh Khalsa College, India

Title: **Pathogen detection by fiber optic microfluidic biosensor**
Zurina Zainal Abidin, Universiti Putra Malaysia, Malaysia

Title: **Biofiltration with *Cyperus alternifolus* for nutrient removal and water reuse in suburban area**
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Title: **Metabolomics approach for biomarker discovery of *Epinephelus fuscoguttatus* infected with vibriosis**
Syarul Nataqain Baharum, Universiti Kebangsaan Malaysia, Malaysia

Title: **Exploring active microbial community of anaerobic digestion systems by 454 pyrosequencing**
Xiaoying Helen Lu, Technological and Higher Education Institute of Hong Kong, Hong Kong

Title: **Morphological identification of rod lactic acid bacteria using scanning electron microscope and image analysis**
Hoda Elzeini, Cairo University, Egypt

Title: **Odour Treatment in Potable Water using Biofiltration with Ozone Addition**
Yiu Fai Tsang, The Hong Kong Institute of Education, Hong Kong

Title: **Methodology for the valuation and negotiation of the biotechnology products with intangibles**
Dora Garcia Delgado, Center for Genetic Engineering and Biotechnology of Cuba, Cuba

Title: **Age at natural menopause and osteoporosis: A genomic appraisal**
Mahima Gulabani, University of Delhi, India

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Morphology control of filamentous fungus Mucor plumbeus for improved microbial oil production

Zhanying Zhang and **Ian M O'Hara**
Queensland University of Technology, Australia

Microbial oils have important applications in producing high value fuels and nutraceutical products. In recent years, microbial oil production by oleaginous filamentous fungi has attracted increasing interest because fungi have relatively high growth rates are able to use a variety of carbon sources and have relatively low harvesting cost compared to heterotrophic cultivation of microalgae. Many studies on microbial oil production by filamentous fungi have been focused on low-cost substrates such as lignocellulosic biomass. However, research on morphology control is limited, which is challenging in cultivation of filamentous fungi and critical towards process scale-up and commercialization. We have previously identified an oleaginous filamentous fungus *Mucor plumbeus* for microbial lipid production. Cultivations of this fungus at different conditions and scales have shown the variation in fungal morphological forms. Different inoculation and process control strategies have been proposed and preliminary tested in order to control the morphological forms of this fungus suitable for reactor cultivation and process scale-up.

Biography

Zhanying Zhang has obtained his PhD in 2008 from the University of Adelaide, Australia. He is currently a Research Fellow at Queensland University of Technology, Brisbane, Australia. He is an experienced Researcher in fermentation technology, bioprocess optimization and scale-up, biomass pretreatment and biorefinery. He has published more than 30 papers in peer-reviewed journals and 4 book chapters. He also has 3 patent applications in processing lignocellulosic biomass for the production of fermentable sugars.

jan.zhang@qut.edu.au

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Decolorization of textile dyes Basic Red 46 and Reactive Black 5 by Staphylococcus epidermidis MTCC 10623

Sarabjeet Singh Ahluwalia and **Anamika Pokharia**
General Shivdev Singh Dewan Gurbachan Singh Khalsa College, India

A critical situation has aroused due to increased discharge of wastewater containing considerable extent of azo dyes from textile dyeing and manufacturing industries, which requires prior treatment, before being released in order to prevent contamination of natural water courses and ground water. In the present study, *Staphylococcus epidermidis* MTCC 10623 isolated from contaminated site was explored for the decolorization and degradation of two different types of azo dyes such as Basic Red 46 (BR 46) and Reactive Black 5 (RB 5), extensively used in textile processing industries. *S. epidermidis* has shown remarkable decolorization potential (99.6 and 97%) for the selected dyes at the concentration of 100 mg/L under optimized conditions (pH: 9.0; temp: 40 and 35 °C) after 6 and 24 hours incubation respectively. Moreover, addition of carbon (glucose: 0.3%) and nitrogen (ammonium sulfate: 0.1%) source as co-substrates enhanced the decolorization potential of S. epidermidis. Further, decolorization of BR 46 and RB 5, was achieved 99.7 and 97.2% decolorization within 6 and 24 hours respectively with immobilized S. epidermidis over polyurethane foam. Biodegradation analysis of metabolites formed after bacterial treatment by UV-Vis and FTIR spectrophotometer confirms the degradation of these dyes. Phytotoxicity assay of extracted metabolites on *Triticum aestivum* and *Vigna radiata* showed good germination rate and growth of radical and plumule demonstrating the non-toxic nature of treated dye solution and suggest that this bacterium is the efficient azo dye degrading bacteria and has practical application in biological treatment of dye-polluted wastewater streams.

Biography

Sarabjeet Singh Ahluwalia has completed his PhD from Thapar Institute of Engineering & Technology, (Presently Thapar University), Patiala. He is an Assistant Professor in Biotechnology at General Shivdev Singh Dewan Gurbachan Singh Khalsa College, Punjab, India. He has published more than 21 papers in reputed journals and has been serving as an Editorial Board Member of repute. He has three patents to his credit. He has reviewed a number of research papers/ manuscripts.

sarabjeetbiotech@rediffmail.com

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Pathogen detection by fiber optic microfluidic biosensor

Zurina Zainal Abidin, Samla Gauri, Mohd Adzir Mahdi and **Nurul Amziah Md Yunus**
Universiti Putra Malaysia, Malaysia

Pathogens that usually associated with pathogenesis affect human health with massive diseases including chronic infections or immune system disorders. Although numerous vaccinations have been introduced to protect against diseases, some pathogens continues to threaten living life. The current pathogen detection method which based on molecular culture and PCR techniques are essentially slow and time consuming. In recent time, several researchers have attempted to develop rapid detecting tool. Despite advanced engineering, there is still need for an accurate and rapid pathogen detection tool. Thus, this research was carried out to highlight on detection of pathogens using optical biosensor. An optical biosensor (microchannel) is relatively an accurate method of early detection of pathogen. Optical microchannel was fabricated with fiber optics by using photolithography method. Fiber optic biosensor is light scattering, absorption and optical properties of the microorganisms. The chemical composition, energy, the total nucleotides and photo pigments will define the absorption properties of each microorganism. *E. coli* was detected at region of 280 nm to 285 nm by using the microchannel while, *S. cerevisiae* identified at visible region of 570 nm to 580 nm. The entire detection can be done in less than 10 minutes with minimum required cells of 1×10^2 cells per mL with total volume of 6 µl. These detection regions for each sample were compared with spectrophotometer measurement plus theoretical calculations by using Beer Lambert law of absorption.

Biography

Zurina Zainal Abidin has received her BEng in Chemical Engineering from Loughborough University, UK in 1997, Masters in Biotechnology at University of Manchester Institute of Science and Technology, UK and PhD in 2006 from University of Manchester, UK in Biochemical Engineering. Earlier, she developed her career as a Process Engineer in Elektrisola (M) Sdn Bhd in 1998. Later in 1999, she joined Universiti Putra Malaysia (UPM) and currently working as an Associate Professor at Department of Chemical and Environmental Engineering. Her research areas focus on biochemical engineering application on bioseparation using electrokinetics/microarray technology, extraction of bioproducts membrane filtration, biosensor and also wastewater treatment. She has successfully supervised many postgraduate in similar disciplines and also published more than 30 articles in relation to biochemical engineering area.

zurina@upm.edu.my

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Biofiltration with *Cyperus alternifolus* for nutrient removal and water reuse in suburban areas

Yiu Fai Tsang
The Hong Kong Institute of Education, Hong Kong

Biofilter, which capitalizes on the principle of constructed wetland in pollutant removal, reduce the concentration of pollutant in wastewater passing through by a combination of physiochemical processes and biological processes. Apart from physical adsorption, sedimentation and filtration occurred on the supporting media; biofilms are developed on the supporting media in biofilter and are responsible for the nutrient removal processes. A biofilm forms when multilayers of bacteria, algae and fungi plus microfauna embedded in a polymer matrix develop at a surface or as mobile biofilms or aggregates. Aggregates of microorganisms grow at a solid-liquid interface, the support materials of biofilms are packed in the reactor in which the metabolic processes are supposed to take place. Besides, plants in wetland system also contribute to the overall pollutant removal function, though the proportion of pollutant removals (N & P) by plant uptake and harvesting was just around 10-15%. Vegetations in wetland system serves to leak oxygen to the root zone, provide substrate for microbes, act as natural filter for suspended solid, alter the hydraulic retention time and take up nutrients such as nitrogen & phosphorus. The plant roots and the substrates in biofilter systems provide a large surface area, which would certainly encourage the development of biofilm at the surface-water interface. By introducing plants into biofilter system, on one hand can enhance pollutant removal efficiency and on the other hand can also reduce maintenance and increases the life of the filter. Sequencing batch technology, which commonly used in activated sludge treatment system, has proven to be a viable alternative to continuous-flow systems in carbon and nutrient removal from domestic and industrial wastewaters. The wastewater is filled into and drawn away from the system alternatively and hence resulting "wet" and "dry" conditions in sequential pattern. The intermittent pulse feeding sometimes is called as tidal flow feeding, has been adopted in the vertical flow bed system to maintain adequate aeration and avoid clogging. The pollutant removal processes in the filter bed are also diversified in tidal flow reactor with regular changes of system environment. For instance, co-current nitrification and denitrification can be achieved within the time frame of one cycle through simple adjustment of aeration density. Miller and Wolf (1975) have also shown that nutrient adsorption capacity of vertical filter bed can be regenerated if the system is allowed to rest and dry regularly during the operation. In this study, a lab-scale vertical flow cinder bed was set up to treat domestic wastewater. Cyperus *alternifolius was* planted into the three of the six biofilter column beds operating with alternative changes of wet and dry periods. Three operating modes (tidal flow patterns) with different durations of wet and dry periods were investigated for their performances of pollutant removals, including biochemical oxygen demand (BOD5), chemical oxygen demand (COD), ammonia (NH3-N), nitrate (NO3 -), total phosphorous (TP) and total suspended solids (TSS).

Biography

Yiu Fai Tsang is currently an Assistant Professor in the Department of Science and Environmental Studies at the Hong Kong Institute of Education (HKIEd). He has received his PhD from the Hong Kong Polytechnic University (PolyU). He has further worked as a Visiting Scholar in the Department of Agricultural and Biological Engineering at the University of Illinois at Urbana-Champaign (UIUC). Prior to joining HKIEd, he was a Research Fellow in the Department of Civil and Environmental Engineering at PolyU. In addition, he is the Program Leader of Master of Social Sciences in Community Education for Environmental Management.

tsangyf@ied.edu.hk

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Odour treatment in potable water using biofiltration with ozone addition

Yiu Fai Tsang[1], **M C Law**[2] and **H Chua**[3]
[1]The Hong Kong Institute of Education, Hong Kong
[2]The Hong Kong Polytechnic University, Hong Kong
[3]Technological and Higher Education Institute of Hong Kong, Hong Kong

Traditional water treatment processes cannot provide an effective removal of geosmin and MIB. The application of activated carbon is one of the most commonly used treatment processes, however, the presence of natural organic materials can result in competition for adsorption sites, leading to decreases in geosmin and MIB removal. Larger dose of activated carbon is required for effective removal. A cost effective and practical method for the treatment of MIB and geosmin is therefore required. One of the effective processes is ozone-enhanced biofiltration. Locating biofilters downstream of ozonation improves dissolved organic carbon removal and can aid in producing biologically stable water such that the potential for biofilm re-growth in water distribution systems is minimized. Field operational data suggests that ozone can oxide 10% to more than 90% of the Geosmin and MIB and typical biofiltration can reach 50% removal only. Several factors may significantly influence geosmin and MIB removal in biofilters, including such as seasonal water temperature variations, filter media (GAC, EC or sand), empty bed contact time. Some investigations demonstrated that temperature and media are the most important factors affecting drinking water biofiltration processes and may influence the removal of compounds such as geosmin and MIB. In this study, the major factors affecting the biological degradation of geosmin and MIB removal in biofilters, including initial concentration, empty bed contact time, ozone dosage and media were examined.

Biography

Yiu Fai Tsang is currently an Assistant Professor in the Department of Science and Environmental Studies at the Hong Kong Institute of Education (HKIEd). He has received his PhD from the Hong Kong Polytechnic University (PolyU). He has further worked as a Visiting Scholar in the Department of Agricultural and Biological Engineering at the University of Illinois at Urbana-Champaign (UIUC). Prior to joining HKIEd, he was a Research Fellow in the Department of Civil and Environmental Engineering at PolyU. In addition, he is the Program Leader of Master of Social Sciences in Community Education for Environmental Management.

tsangyf@ied.edu.hk

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Metabolomics approach for biomarker discovery of *Epinephelus fuscoguttatus* infected with vibriosis

Syarul Nataqain Binti Baharum and **Nurdalila Awani Abdul Aziz**
Universiti Kebangsaan Malaysia, Malaysia

Epinephelus fuscoguttatus or tiger grouper has excellent biological characteristics, fast growing and suitable for aquaculture. This posed a promising industry but is unfortunately hindered by a host of diseases, which often associated with feeding leading to great economic loss. Our goal is to study the metabolite responses to vibrosis in grouper and identify unique metabolites as biomarker to help future remediation/prevention of vibriosis. In this work, larvae of grouper were infected with vibriosis, under fed and non-feed conditions. Metabolites were then extracted from infected (challenged) and non-infected (control) larvae, which died and compared with that of survived. Metabolites profiled were obtained using GC-MS based metabolome analysis. The differences between the challenged and control samples were significantly influenced by the production of fatty acids. A total of 11 fatty acids under challenged feeding and 13 fatty acids under challenged starvation of ω-9 were detected. However, in the control feeding and control starvation conditions, only four fatty acids of ω-9 were detected namely, lauric acid, myristic acid, palmitic acid and trans-9-palmitoleic acid. The detected compounds were quantified based on three different extraction techniques with the highest at 34 mg/ml and the lowest at 17 mg/ml and mapped in the major fatty acids pathway. There were significant differences ($P \leq 0.001$) of ω-9 production between the challenged and control samples. These changes demonstrate that vibriosis in the fish will induce a biochemical response, especially ω-9 that can be used as biomarker to determine the survival rate of *E. fuscoguttatus*.

Biography

Syarul Nataqain Binti Baharum has received intensive training in the field of Metabolomics at the University of Sheffield, United Kingdom under supervision of Professor Dr. Michael Burrell and Professor Dr. William Paul Quick. Her research is focused on the new insight of analytical and biological perspectives of the metabolomics in the field of systems biology. Her work has been awarded prestigious awards including BioInnovation Awards, 2011 and Selangor My Innovation Award, 2014.

nataqain@ukm.edu.my

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Morphological identification of rod lactic acid bacteria using scanning electron microscope and image analysis

Hoda M Elzeini, A A Ali, N F Nasr and **Ashwak A Hassan**
Cairo University, Egypt

Lactic Acid Bacteria (LAB) widely distributed in nature and play an important role in much food fermentations. Bacterial cell morphology is useful and valuable characteristics used in the identification of any organism in order to classify. Therefore, cell morphological shape and size of four strains of rod LAB grown in two different media (MRS and RSM) were studied using Scanning Electron Microscope (SEM) and image analysis technique. Topographical images reveal rectangular shapes with smooth corners and height profiles and variation in size which occurred singly or in pairs or chains. Rod cells had a wide range of breadth (0.40-1.07 µm) with cells' perimeters of 4.64 up to 11.7 µm and the elongation varies between 0.572 and 0.790 µm. Both areas of *Lb. helveticus* 764N and *Lb. casei* 761N were reduced when grown in RSM than in broth medium. On the contrary, cells' areas of *Lb. acidophilus* 791N and *Lb. paracasei* 72MP increased when grown in RSM than in broth medium. RSM lowered the compression on cells walls either by the adsorbed water to the surface of the cells or by extra nutrients provides. All the aseptic ratios measured were higher than 1. Rod cells had a different orientation angles and surfaces seem to have heights or extrudes with external boundary was either a sharp outline or a rough surface. Cells hardness and wall thickness affected negatively or positively depending on the strain and growing medium. In conclusion, image analysis of SEM could be a good and accurate tool for measuring many morphology, shape and size parameters for the viable bacterial cells which can be used for identification and classification of rod LAB with determination of defined standard conditions for optimum growth.

Biography

Hoda M Elzeini has completed her PhD from Michigan State University, USA. She is a Professor in Cairo University, Dairy Science Department of Faculty of Agriculture in Egypt. She has published more than 20 papers in reputed journals and has been serving as a Reviewer for some journals. She is teaching dairy technology and food rheology courses. She was trained in England and India to use advance rheological apparatuses.

dr_hodazeini@yahoo.com

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Exploring active microbial community of anaerobic digestion systems by 454 pyrosequencing

Xiaoying Helen Lu, K L Pun and **H Chua**
Technological and Higher Education Institute of Hong Kong, Hong Kong

Biotransforming organic waste into energy has been regarded as one of the promising technologies to combat energy crisis in the future. In this study, we queried the highly active functional population in the anaerobic digestion system with various potential substrates (food waste, cellulose, xylan) by integrating the sludge DNA and RNA of subculture from the substrates. Using barcoded 454-pyrosequencing, we analyzed and compared the bacterial and archaeal 16S rRNA genes of one digester sludge (DNA) sample and three subcultures (cDNA) by giving three individual substrates to the digester sludge in order to identify the active members in digesting organic wastes to biomethane. A total of 19K bacterial and 13K archaeal effective sequences were assigned to taxonomy from phylum to genera levels, providing insights into the microbial community structure and further correlating the community members to the performance of the subculture. The principal coordinates' analyses on the basis of UniFrac of OTUs revealed that there are significant differences among the digester sludge and digestion culture samples. Cellulose and xylan culture community are more closer to each compared to food waste culture, even though it still has a slight difference between cellulose and xylan culture. Overall, the phylogenetic information based on DNA and RNA provides a comprehensive and systematic view of the anaerobic microbial community within the digestion systems.

Biography

Lu Xiao Ying has obtained his PhD in Civil Engineering from the University of Hong Kong, Hong Kong. She is currently an Assistant Professor of the Faculty of Science and Technology, Technological and Higher Education Institute of Hong Kong (THEi). She is specialized in environmental microbiology, bioenergy production from solid waste and advanced materials development in energy and environment.

xylu@vtc.edu.hk

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Methodology for the valuation and negotiation of biotechnology products with intangible assets

Dora Garcia Delgado
Center for Genetic Engineering and Biotechnology of Cuba, Cuba

Heber Biotec S A, a Commercialized Company from the Center of Genetic Engineering and Biotechnology of Cuba. The High Tech Enterprise is playing an important role in the economy among other aspects as a source of high aggregated value products and intangible assets. The biotechnology enterprise is an exponent of this enterprise. Upon the basis of a document analysis and experts interchange applying Delphis method, a diagnostic is done concerning the treatment given to the biotechnology products with intangibles during negotiations. From such diagnostic the lack of a standard calculation method and the lack of a guide for preparing negotiations were identified as well as the lack of commercial culture concerning the biotechnology products with intangibles negotiation. The general objective of this work is to design a methodology for the valuation and deal making of biotechnology products. For the fulfillment of this objective a deep bibliography was reviewed granting the required concepts to design the methodology which establishes a sequence for the negotiation, recommends a calculation method and some accurate data like the range of payments, royalties percentages, coefficients to separate the intangibles form the total value of the biotechnology project or product. In the whole bibliography reviewed no other guide was found with the integration of calculation method and negotiation methodology in a sequence that become this methodology in a practical tool that allow to entrepreneur who start in biotechnology to evaluate and prepare a biotechnology product negotiation.

Biography

Dora Garcia Delgado is graduated in Foreign Trade Economy, Diplomat in Foreign Trade and Masters in Science and PhD in Economic Science from Havana University. She was trained at Business Support Centers Japan 2001 and Seoul 2003. She has participated in several negotiations of Cuban biotechnology products. She has publications in *Journal Applied Biotechnology of Cuba*: About negotiation of Biotechnology products with intangibles, the evolution of negotiation of biotechnology products further than the intellectual property protection and methodology for the valuation and negotiation of biotechnology products with intangibles.

dora.garcia@heber-biotec.com

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Age at natural menopause and osteoporosis: A genomic appraisal

Mahima Gulabani
University of Delhi, India

Menopause (end of menstruation) is a hallmark event concerned with the end of female's reproductive life. Throughout the last decade the interest in the mechanisms behind ovarian aging and the timing of natural menopause has increased since it has a great cultural, social and epidemiological implications for female's fertility, health and health risks. Osteoporosis, one of the profoundly postmenopausal associated health risk, as stated by WHO (1991) is " a disease characterized by low bone mass and micro-architectural deterioration of bone tissue, leading to enhanced bone fragility and a consequent increase in fracture risk". Studies have revealed menopause causes loss of ovarian steroids and estrogen that have been significant correlated with loss of bone mineral density. Also, genomic markers particularly concerned with the variants of Vitamin D receptor gene, ATP6V1G, ESR1, MHC, COLIA 1 and TGF-β1 genes have been found to be associated with decreased bone density and therefore serves to be a potential marker for estimating osteoporosis risk. Thus, an attempt to evaluate this menopause associated genes in addition with an insight into the lifestyle factors must be done in different populations, contributing to the development of holistic women specific public health related policies.

Biography

Mahima Gulabani is a graduate and post-graduate in Anthropology with specialization in Biological Anthropology, with an excellent academic record from the University of Delhi. I am currently a Senior Research Fellow at University of Delhi, pursuing my Ph.D. in Molecular Anthropology (Molecular Genetics) with regard to study related to women's reproductive health among Indian Populations.

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Night soil a potent plant growth enhancer

Surya Anjani Kumar and **Archana Giri**
Jawaharlal Nehru Technological University, India

Black soot is the other name for Night soil. Night soil is the euphemism of composted feces. Night soil is generally collected by sanitation department by tankers and disposed at the outskirts of the towns or cities. The composted humanure is a very rich source of micro and macro nutrients which are very useful for plants. The idea behind the work is to utilize this black soot as a biofertilizer for enhancing the growth of plants. It is a process of bioremediation where the compost is produced in situ. The compost is generally disposed but if this compost is air dried and added by some microbial mixtures it is an excellent biofertilizer. Current work majorly concentrates on microbial mixtures which are to be added to the black soot to use it for potted plants, Gardens, Bonsai & fields. The collected black soot alone is tested for NPK values and carbon content. To the surprise it is found to be very high than normal values making it suitable for using it as a potential organic fertilizer. Pure cultures of *Nostoc, Azolla, Anabena, Trichoderma*, VAM, PSB etc are maintained and are added to the black soot in different proportions to check for the better combination and good results. To the surprise the process opened new avenues for research in formulating an excellent biofertilizer suitable for all varieties of plants, enhancing their growth, fruiting, yield & resistance.

Biography

Surya Anjani Kumar is currently pursuing Post doctorate at JNTU Hyderabad working on *"Effect of Fresh Water Crab Shell Fog on Cucurbitaceae"* and identifying biological growth promoters. His work is mainly concentrated on applying fog at field level, observing phenotypic changes & identifying the novel volatile compound which is responsible for the effect specifically on Cucurbitaceae.

s.anjanikumar@gmail.com

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