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12th Euro Biotechnology Congress

November 07-09, 2016 Alicante, Spain

Keynote Forum

(Day 1)

Stefan Selbert, J Biotechnol Biomater 2016, 6:7(Suppl)
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Stefan Selbert

PolyGene Transgenetics, Switzerland

State-of-the-art technologies for the generation of animal models of human disease

Animal models play a critical role in the exploration and characterization of disease pathophysiology, target identification and in the *in vivo* evaluation of novel therapeutic agents and treatments. The "better" the animal model, the higher the chances that clinical trials will be successful and drugs will enter the market at lower costs, in shorter time. Genome engineering technologies have soared in recent years: Chemical mutagenesis, RNA interference, gene targeting in ES-cells, humanized genes and most recently nucleases, such as ZFNs, TALENs and CRISPR/Cas9. New technologies provide new avenues not only to mimic multi factor based disease such as cancer but also to extend model generation on higher species and even human or patient derived cells and tissue. New inducible switches are underway which will allow altering gene expression of not just one but multiple genes and even entire signal transduction pathways within the same cell and tissue, e.g., during disease progression at will in a temporospatial control way. Technologies presented will be of tremendous value for future generations of cellular or animal models and when carefully selected, designed and conducted will play an important part of any translational drug development strategy.

Biography

Stefan Selbert has achieved his PhD at the Max-Planck-Institute of Biochemistry in Martinsried and holds a certificate in Business Administration. He also functions as an Evaluator in Brussels for EU-FP7-PEOPLE and EUREKA Eurostar programs.

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Denis Spitzer

Nanomateriaux pour les Systemes Sous Sollicitations Extremes, France

Large-scale continuous manufacturing of nano-cocrystal drugs and therapeutics

NS3E laboratory developed the Spray Flash Evaporation (SFE) for preparing energetic organic nanoparticles at industrial scale. The energetic solution is kept in a pressurized tank separated from a vacuum chamber by a hollow cone nozzle, used both to heat and spray the liquid. The instantaneous evaporation of the solvent originates from the combination of the abrupt pressure drop and the high energy stored by the overheated solvent prior to nebulization. The flash evaporation leads to small crystallites with narrow size distribution. The nanoparticles may be composed of single compounds, mixtures of several substances or co-crystals. The idea to transport these findings to the medicine became evident. In this domain, co-crystals are of critical importance as they enhance bioavailability and up-take by the human body of Active Pharmaceutical Ingredients (API). Up to now, most used techniques are of batch nature and not able to give access in big amounts to nanosized crystals or co-crystals of therapeutic interest. The SFE permits the continuous manufacturing of nanosized co-crystals, in large amounts with a kinetic complying with the pharmaceutical industry's requirements. The efficiency of SFE was shown by the manufacturing of nano-cocrystals based on caffeine/oxalic acid (2/1) and caffeine/glutaric acid (1/1) with a mean particle size of 60 and 100 nanometers respectively. SFE currently used to produce nano-cocrystals, offers other promising prospects at the interplay between medicine and energetics that will be highlighted in this conference.

Biography

Habil. Denis SPITZER received his in physical chemistry in 1993 at the University Louis Pasteur of Strasbourg. He is the founding and current Director of the NS3E Research Laboratory UMR 3208 ISL/CNRS/UNISTRA. He conducts research in continuous nanoscristallization processes of organic nanomaterials such as model medicaments and energetic materials. He is the inventor of the SFE process. He is the author of more than 150 publications and scientific reports. He received in 2013 the award of strategic thinking given by the French Homeland Minister, and more recently, in 2015, the « Grand Prix Lazare Carnot » award of the French Academy of Science, for dual use research.

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Thomas McKeon

United States Department of Agriculture, USA

Industrial oil crops as renewable resources providing replacements for petrochemicals

The bio-based economy of previous centuries was rapidly displaced with the widespread availability of petroleum and the development of petrochemistry. However, seed oils from some crops are able to provide chemical products that could readily supplant many petroleum-derived products. Biodiesel is an obvious example and many seed oils are useful in producing fatty acid methyl esters for biodiesel. Yet, certain oilseed crops are especially useful in providing replacements for more complex, higher value products such as polymers, lubricants and coatings. These crops include but are not limited to linseed, tung, jojoba and castor with the castor plant perhaps the most broadly useful. The castor oil plant produces a seed containing >50% oil with up to 90% ricinoleic acid, 12-hydroxy oleic acid. The presence of the mid-chain hydroxyl group imparts physical and chemical properties making castor oil uniquely useful as a feedstock for numerous products. However, limited production of castor has allowed petroleum-derived products to displace many castor oil based products from the marketplace, despite better performance characteristics of the castor-based products. A focus on improving castor will ultimately support expanded castor oil production.

Biography

Thomas McKeon has received his PhD in Biochemistry at UC Berkeley and Postdoctoral research in Plant Biochemistry at UC Davis. He has over 100 publications, mostly in plant lipid enzymology and molecular biology. He is an Editor and chapter author for the book Industrial Oil Crops, published in March, 2016 by Elsevier and AOCS Press. He is an Editor for *Biocatalysis and Agricultural Biotechnology* (BAB), Board Member for American Oil Chemists Society (AOCS), Biotechnology Division and International Society for Biocatalysis and Agricultural Biotechnology (ISBAB). He has organized conferences for ISBAB and for US-Japan Natural Resources (UJNR) Food and Agriculture Panel.

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Fuad Fares
University of Haifa, Israel

Developing long acting agonists and antagonists of glycoprotein hormones using gene fusion and gene transfer: From bench to clinics

Peptides are used clinically in the treatment of many diseases. One major issue regarding the clinical use of many peptides is their short life span in the body, due to the rapid clearance of those proteins from the circulation. The low stability of peptides has thus often posed a difficulty to researchers and hindered their adoption in potential medical applications. At the clinical level, there is a need for a regime of frequent injections of the peptides into the patients to overcome this low stability factor. The major strategies for overcoming this problem are based on chemical techniques and using specific peptidase inhibitors or cocktails. To overcome this problem, we used genetic engineering techniques that have been found successful for designing long acting hormones for the treatment of fertility and thyroid diseases. Ligation of a peptide containing 4 O-linked oligosaccharide chains to the carboxyl-end of Follitropin (hFSH), Thyrotropin (hTSH), Growth hormone (GH), Factor VII and to erythropoietin (EPO) resulted in increasing the biological activity and longevity *in vivo*. Moreover, ligation of the subunits into a single gene resulted in active and stable compounds. Designing long acting peptides will diminish the cost of these drugs and perhaps reduce the number of injections for the patients who need them. New analog of hFSH was approved during 2010 by the European Community for clinical use, GH is in clinical trials phase III and Factor VII is in clinical trials phase I. On the other hand, hTSH variants lack of N-linked oligosaccharide chains are less potent than hTSH wild-type on cAMP accumulation and T3 secretion from human cultured thyroid follicles. Moreover, deglycosylated variant compete with normal hTSH and human Thyroid Stimulating Immunoglobulin (TSI) in a dose dependent manner. Thus, this variant, behave as potential antagonists, which may offer a novel therapeutic strategy in the treatment of Grave's disease, the most common form of hyperthyroidism.

Biography

Fuad Fares has completed his DSc studies at the Faculty of Medicine, Technion-Israel Institute of Technology and Postdoctoral studies at the Department of Molecular Biology and Pharmacology, School of Medicine, Washington University, St. Louis Missouri. He is the Director of the Department of Molecular Genetics at Carmel Medical Center and Associate Professor at the Department of Human Biology, University of Haifa. He has published more than 75 papers in reputed journals and serving as a Member of the Israel Council for Higher Education. He is the inventor of designing long-acting recombinant proteins and the initiator of PROLOR Biotech Company.

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D H Tejavathi
Bangalore University, India

Novel *in vitro* techniques for sustainable cultivation and efficient induction of genetic variability in *Agave vera-cruz* Mill

Agave vera-cruz Mill is a member of Agavaceae, is one of the important fiber yielding, ornamental and medicinal plants. Gradual depletion of genetic resources of economically important plants is the result of indiscriminate collection of the source material and disappearance of natural habitats due to human intervention. At this juncture, plant genetic improvements programs are primarily dependent on the availability and efficient induction of genetic variability. Novel techniques like *in vitro* culture, *in vitro* mutagenesis and AM fungal association provide a scope for induction of much needed genetic variability in the base populations. Nearly 100 shoots were differentiated from callus raised from shoot tip cultures on transferred to ½ MS+BAP. Among the regenerated plants, a few plants raised through indirect organogenesis have shown a few phonotypic variations from the source plants. Shoot tips were exposed to EMS at various concentrations and α-irradiation for varying periods and doses. It was found that multiple shoot induction from these cultures was two-fold more than the control plants. Normal and tissue culture plants were treated with *Glomus mosseae* and *G. fasiculatum*; two AM fungal species to study their effect on the enhancement of the biomass and active principles. The increase in biomass was found to be threefold than the control plants. Effect of *in vitro* mutagenesis and AM fungal association on the synthesis of primary and secondary metabolites in control and treated plants were studied. Finally, genetic variability induced by these novel techniques in micro-propagated plants was analyzed by AFLP markers.

Biography

D H Tejavathi is working as UGC BSR-Faculty Fellow in the Department of Botany, Bangalore University, India. She has published 80 research articles in various national and international journals and completed 8 research projects funded by DST, CSIR, BU-UGC and MoEF, India. She was conferred with an award 'Merit of Excellence' for outstanding contribution to the medicinal plant research during the 4th international conference on medicinal plants and herbal products held at John Hopkins University, USA, 2012.

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