Abstract Book

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International Experts Summit on

Toxicology and Pharmacology

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About IESTP 2023

We are pleased to invite all researchers, young scholars, delegates, experts and students from all over the world to attend the International Experts Summit on Toxicology and Pharmacology (IESTP2023) will be held in Dubai, UAE during October 09-11, 2023.

IESTP2023 provides a platform of international standards where you can discuss and share knowledge on Toxicology and Phamacology to bring a unique forum for exchanging the information regarding the latest developments, finding solutions and enriching the knowledge. In addition to Presentations, Workshops, and Discussions, the conference also offers a unique venue for renewing professional relationships, and providing plenty of networking opportunities during the summit.

We're looking forward to Meghaz meetings with researchers from different countries around the globe for sharing innovative and great results in Toxicology and Pharmacology.

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Stereolithographic Additive Manufacturing of Ceramic Implants for Spatial Modulations of Biological Fluid Flows

Soshu Kirihara
Osaka University, Japan

Abstract
In stereolithographic additive manufacturing (STL-AM), 2-D cross sections were created through photo polymerization by UV laser drawing on spread resin paste including nanoparticles, and 3-D models were sterically printed by layer lamination. The lithography system has been developed to obtain bulky ceramic components with functional geometries. An automatic collimeter was newly equipped with the laser scanner to adjust the beam diameter. Fine or coarse beams could realize high resolution or wide area drawings, respectively. As the row material of the 3-D printing, nanometer sized metal and ceramic particles were dispersed into acrylic liquid resins at about 60 % in volume fraction. These materials were mixed and deformed to obtain thixotropic slurry. The resin paste was spread on a glass substrate with 50 μm in layer thickness by a mechanically moved knife edge. An ultraviolet laser beam of 355 nm in wavelength was adjusted to 50 μm in variable diameter and scanned on the spread resin surface. Irradiation power was automatically changed for an adequate solidification depth for layer bonding. The composite precursors including nanoparticles were dewaxed and sintered in the air atmosphere. In recent investigations, ultraviolet laser lithographic additive manufacturing (UVL-AM) was newly developed as a direct forming process of fine metal or ceramic components. As an additive manufacturing technique, 2-D cross sections were created through dewaxing and sintering by UV laser drawing, and 3-D components were sterically printed by layer laminations with interlayer joining. Through computer-aided smart manufacturing, design, and evaluation (Smart MADE), practical material components were fabricated to modulate energy and material transfers in potential fields between human societies and natural environments as active contributions to Sustainable Development Goals (SDGs).

Biography
Soshu Kirihara is a doctor of engineering and a professor of Joining and Welding Research Institute (JWRI), Osaka University, Japan. In his main investigation “Materials Tectonics as Sustainable Geoengineering” for environmental modifications and resource circulations, multi-dimensional structures were successfully fabricated to modulate energy and materials flows effectively. Ceramic and metal components were fabricated directly by smart additive manufacturing, design and evaluation (Smart MADE) using high power ultraviolet laser lithography. Original stereolithography systems were developed, and new start-up company “SK-Fine” was established through academic-industrial collaboration.

Personalized and Precision Medicine (PPM) as a Unique Healthcare Model to Be Set Up via Translational Applications and Upgraded Business Modeling to Secure the Human Health, Ecological Biocoenosis and Biosafety

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Abstract

A new systems approach to diseased states and wellness result in a new branch in the healthcare services, namely, ***personalized and precision medicine (PPM).*** As we attempt to exit the Anthropocene and imagine a new, symbiotic way of existence, the ability to visualize the biological underpinnings of the personal, public, and planetary health continuum is becoming a remarkable asset. It has the potential to, at once, truly personalize healthcare, and at the same time undo the untenable status quo that otherwise maintains grotesque social inequities and the global spread of products that are unhealthy for person, place, and planet. So, the need for ecologic perspectives in medicine is now obvious. It's time to (re)claim the vital term ***clinical ecology*** (rooting from PPM-based ecosystems) - a label that once represented a fringe field focused on sick building syndrome.

Because of technological advances, particularly PPM-based healthcare services, digitization increasingly influences health-related business models. And PPM is considered to be an emergent and complex phenomenon that encompasses several industries, has the potential to impact both private and public organizations as well as citizens worldwide but surprisingly has not yet been studied from an ecosystem perspective. So, PPM whilst playing a crucial role in the modern healthcare services, it is already an important topic in public and private health care debates with clear importance in the future. It presents a huge potential for the improvement in diseases' diagnostics, treatment and prevention!

We would introduce a new concept, ***precision toxicology*** as a mode of action of drug-induced toxicity to be sensitively and specifically investigated by isolating a single cell with typical phenotype of interest being followed by a single cell sequencing-based analysis. Now, canonical toxicology is being transformed by new scientific approaches and modern ideas at establishing causation between chemicals and their adverse health effects.
The aims of the professional communities today to promote precision toxicology is to promote alternative methods to animal testing and to build a novel scientific approach establishing causation between chemicals and their adverse health effects. The approach mentioned focuses on human cell lines and a diverse suite of biomedical model organisms, i.e. fruit flies, water fleas, round worms and embryos of zebrafish and frogs, which share many genes with humans by evolution. These cost-effective testing models enable the mapping of origins of toxicity pathways on the branches of the animal evolutionary tree to predict health risks to humans. By providing data where the toxicity of substances is unknown, we will ultimately translate into regulatory and industrial practices that better protect human health and the environment.
Meanwhile, the global aim of the professional communities is to accelerate discoveries that are useful at protecting

the health of populations and the environment by using a mix of genomics, metabolomics, evolutionary theory, quantitative genetics, data science, toxicology, and law. So, precision toxicology can contribute to the better detection of subtle intracellular changes in response to exogenous substrates, and thus help researchers find solutions to control or relieve the toxicological effects that are serious threats to human health and wellness, finally.

Precision Toxicology - that identifies ***molecular key event biomarkers (MKEB)*** predictive of chemically induced adverse health effects in humans and facilitates their uptake into regulatory and industry practice.
Genes account for only a small percentage of pathological phenotypes, while the environment remains the main explanatory factor. And thus PPM uses methods of molecular analysis, especially genetic sequencing and transcription, in order to simultaneously identify genetic mutations (***genomic biomarkers***) to evaluate each individual's risk of contracting a given disease.

Establishing the list of mutations present in a person's genome is not enough to be able to predict that person's future health. In fact, in many cases, it is impossible to measure the effects of genetic mutations in an isolated way, without taking into account the context, meaning the rest of the genome as well as the environment, both of which modify the effect this mutation has on the person's health, and therefore the risk of developing a given disease. But the methodology which is now proposed clearly shows that not only are these elements crucial for understanding individual gene expression, but it also shows that analysis at the level of the individual is possible! Meanwhile efforts to identify and characterize the environmental factors are today brought together under a new label, the ***exposomic*** to follow two directions. One leads to an industrial vision, oriented towards the search for targets susceptible of technical intervention. The other aims towards a critique of political and social choices in public health.

For instance, risk and progression of common, noncommunicable diseases, such as asthma, diabetes, cancer or cardiovascular diseases, crucially depend on environmental and behavioral factors rather than genetic ones! For effective risk identification, we will actually need to integrate genetic effects with environmental exposures. Meanwhile, the prevailing focus on an individual's genes and biology insufficiently incorporates the important role of environmental factors in disease etiology and health. Including these factors in our approach to PPM and population health should bring that theory closer to reality.So, a broader understanding of disease that includes gene-environment interactions would enable individuals and healthcare providers to realistically see genetics as just one of a suite of personalized and precision tools to achieve healthier living, rather than an all-powerful method to reliably predict future disease!

The expanded framework for PPM being proposed would also be applicable beyond the individual for population- or community-level interventions. Those innovative analytical frameworks are required to capture the complex gene-environment interactions and their assessments *via* IT-technologies and software.

It would be extremely useful to integrate data harvesting from different databanks for applications such as prediction and personalization of further treatment to thus provide more tailored measures for the patients resulting in improved patient outcomes, reduced adverse events, and more cost-effective use of the latest health care resources including diagnostic, preventive and therapeutic ones.

For preventive and prophylactic purposes, we would have to secure: (i) stakeholder integration; (ii) comparative toxicology, utilizing high-throughput testing methods across to observe toxic response and molecular data production, applying metabolomics and transcriptomics to comparative toxicology samples to trace adverse outcomes via the molecular key events preceding them; (iii) quantitative susceptibility, applying quantitative genetics and gene expression profiling to understand variation in individual susceptibility and develop empirical exposure thresholds; (iv) biomarker discovery, using machine learning to identify biomarkers for molecular key events and creating the dissemination and translation products for their use; and (v) regulatory analysis and application, partnering with regulatory agencies to identify opportunities for applying the trend and its resources within existing regulatory structures and develop draft guidance for industry use and reporting.

The social and behavioral sciences as well as precision toxicology would play a dual role in PPM to get integrated with the environmental factors in one and the new entity. The first is integrating information on lifestyle and exposures – demographics, environment, social support, sleep, exercise habits and the like – into a comprehensive picture of each individual's health. The second role is studying how patients and practitioners interact with emerging PPM approaches and technologies, to gain understanding that will lead to better policies and best practices.

This knowledge can, in turn, improve individuals' understanding of their health, empower them to make behavioral changes that prevent disease, and improve their compliance with therapies.

With insights into how well individuals understand their health and illnesses, patients' ability to comply with treatment plans and their willingness to share data, practitioners can devise policies and best practices to enable the largest number of people to contribute to and benefit from PPM-related resources.

Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia.

From 1989 through 1995, Dr Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004 - a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). In 1993-1996, Dr Suchkov was a Secretary-in-Chief of the Editorial Board, ***Biomedical Science,*** an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK.

Beyond Toxicology - Safe and Sustainable by Design Chemicals

Blaž Likozar, Filipa A. Vicente, Uroš Novak

SSbD4CheM and PROPLANET projects are introducing a testing phase (TRL 3-5) for safe- and sustainable material development in multiple relevant demonstrators: textile, packaging, glass coating, automotive and cosmetics industries. The demonstrators are the starting point for further implementation and standardisation of the new methods. The materials/chemicals of the demonstrators include PFAS-free textile coatings and natural fibres in different composite materials. Both projects tackle the problem from an industrial perspective and sustainable business use cases, enabling overcoming the barrier to environmental protection, safety, chemical improvements, and circular value chains. In TOXBOX project, a device will be built to provide end-users with a complete system to test chemicals and materials in a SSbD approach. TOXBOX system is based on a smart combination between in vitro testing based on organ models and in silico modelling to better predict human and environmental safety. This device will support decision-making at different life-cycle stages, namely at the production or degradation at the end-of-life, and select the most relevant associated biological models, including human health and environmental assessment.

Recent Advances of Magnetic Gold Hybrids and Nanocomposites, and Their Potential Biological Applications

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Abstract
Magnetic gold nanoparticles (mGNP) have become a great interest of research for nanomaterial scientists because of their significant magnetic and plasmonic properties applicable in biomedical applications. Various synthetic approaches and surface modification techniques have been used for mGNP including the most common being the coprecipitation, thermal decomposition, and microemulsion methods in addition to the Brust Schiffrin technique, which involves the reduction of metal precursors in a two-phase system (water and toluene) in the presence of alkanethiol. The hybrid magnetic–plasmonic nanoparticles based on iron core and gold shell are being considered as potential theragnostic agents. Herein, in addition to future works, we will discuss recent developments for synthesis and surface modification of mGNP with their applications in modern biomedical science such as drug and gene delivery, bioimaging, biosensing, and neuro-regenerative disorders. I shall also discuss the techniques based on my research related to the biological applications of mGNP.

Keywords
Nanohybrids; Magnetic Gold Nanoparticles; Nanocomposites; Surface Functionalization; Core-Shell Nanocomposites; Magnetic-Plasmonic Nanoparticles; Biological Applications

Biography
My research work mainly focuses on the construction and function of DNA nanomachines, which are cutting-edge and challenging topics. I designed and constructed unique DNA motifs using a short circular DNA nanotechnology technique and functionalized these probes with fluorophores, gold nanoparticles, small molecular drugs, and peptide ligands. To achieve plasmon resonance effects, I achieved nano-specific precision in organizing plasmonic nanoparticles on the nano DNA frameworks. My work on the DNA nanomachines provided an efficient fluorescence resonance energy transfer mechanism that realizes the bio-imaging, detection of biological events, and functions of the biomolecules. I have also been working on multilayered hybrid magnetic nanoparticles for applications in nanomedicine for the last three years.

Transcription Factor-targeting Decoy Peptides: A Novel Strategy for Cancer Treatment

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Abstract
Transcription factors ATF5, CEBPB and CEBPD were identified as targets for the treatment of brain, skin, and other cancers. However, until now, there were no drugs targeting all three at once. Here we report the design and development of cell-penetrating dominant-negative decoy peptides as a new strategy for cancer treatment. These peptides could pass through tissue barriers and get into cells, and then exploit the leucine zipper properties of ATF5 and/or CEBPB and CEBPD, thus selectively suppressing the growth and survival of tumor cells from various origins. In addition, these peptides were active in mouse tumor xenograft models in which they promoted apoptotic tumor cell death, inhibited tumor growth and significantly prolonged animal survival. We also identified multiple drug combinations that synergized with these peptides in treating cancers and/or reverse resistance to them. Our results suggested the use of a cell-penetrating sequence has enabled the successful design of peptide drugs that show significant promise for clinical application. Mechanically, these peptides exerted their anti-cancer efficacy through the dysregulation of cell pro- and anti-apoptotic proteins BCL2, MCL1, survivin and BMF, as well as interference with glycolysis in cancer cells.

Keywords
Cell-Penetrating Peptide; Transcription Factors; Cancer Treatment

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Clinical Pharmacokinetics Evaluation of Optimized Liquisolid Tablets as Potential Therapy for Male Sexual Dysfunction

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The study aimed at developing a liquisolid tablet (LST) containing tadalafil (TDL) and dapoxetine (DPX) with improved bioavailability as a potential therapy for male sexual dysfunction. A mixture of nonvolatile solvents, namely PEG 200 and Labrasol®, was utilized to prepare LSTs that were assessed for their quality characteristics. The Box Behnken design (BBD) was employed to statistically explore the effect of the formulation factors on the quality attributes of LSTs. Furthermore, an in vivo pharmacokinetic study was carried out for the optimized LST in comparison with the marketed tablets on healthy human volunteers. The optimized LST revealed acceptable quality limits with enhanced dissolution for both APIs. The pharmacokinetic parameters after oral administration of the optimized LST indicated that the Cmax of TDL in LSTs was 122.61 ng/mL within 2h compared to the marketed tablets, which reached 91.72 ng/mL after 3 h, indicating the faster onset of action. The AUC was improved for TDL in LST (4484 vs. 2994 ng/mL h in the marketed tablet) and DPX in LST (919.633 vs. 794.699 ng/mL h in the marketed tablet). This enhancement in bioavailability potentially minimizes the associated side effects and improves the treatment of male sexual dysfunction, particularly for diabetic patients.

Keywords
Box-Behnken Design; Dapoxetine; in vitro Dissolution; Liquisolid Tablet; Male Sexual Dysfunction; Pharmacokinetics; Tadalafil

Biography
Dr. Fayez Alotaibi has completed his MSc at the age of 40 years from King Abdul Aziz University at Jeddah, Saudi Arabia and He completed his Mpharm at age of 35 years from Bradford University, United Kingdom. He is the director for pharmaceutical Services at King Fahd Jeddah General, Saudi Arabia. He has published more than 3 papers in reputed journals. He is a member of pharmacy and therapeutic committee. He is a member of morbidity and mortality committee. He is a member of Quality and Patient Safety Council.

Impacts of Pesticides on Food Safety and Environmental Toxicology

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Abstract
Industrial development has resulted in an increased release of chemical pollutants and other agents into the environment, causing damage to the environment and increasing the risk of negative impacts on human health through the application and the contamination of various pesticides in agriculture internally or externally found in the food and crop production under unlimited monetarization. Pesticides and toxicants have an important role in the treatment and prevention of disease in animals (including humans) and in plants. But because of their nature and effects on the biosphere, their side-effects on the health of biosphere they are usually investigated in thorough safety and toxicology monitoring, the environmental impacts of the manufacture and use of them are less well understood and have only recently become a topic of research interest. Some pesticides can effect on microbiomes as well as the fauna including the insects and some animals well below the concentrations that are usually used in safety and efficacy examinations. In addition, breakdown products and the combination of different biologically active compounds may have unanticipated effects on the environment. Although it may be safe to assume that these substances do not substantially harm humans, we have only recently begun to research whether and how they affect a wide range of living organisms in the environment and what this means for environmental health.

Keywords
Pesticides; Food and Crop Production; Human Health; Microbiomes