



XII Latin-American Congress of Artificial Organs and Biomaterials

"Integrating and strengthening the Latin-American Biomaterials' Community"

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ROUND TABLE

"What new challenges is tissue engineering facing?"

Coordinator

Dr. Sara Felman

LABOATEM, National University of Rosario, Argentina.

Expositors

Dr. Ângela Maria Moraes

School of Chemical Engineering University of Campinas, Brazil

"Addressing Technical Challenges in Stem Cell Culture to Improve the Accessibility of Regenerative Medicine"

The cultivation of stem cells may result in multiple cell types relevant to regenerative medicine applications. These cells may be successfully combined with biomaterials of different types and geometries and also with specific signaling molecules, increasing their applicability in regenerative medicine. However, the effective translation of the use of stem cells to the clinic is limited by several technical issues. For example, two-dimensional methodologies, often employed for cell culture in bench-scale research and initial *in vivo* and clinical studies, may not be sufficient to provide the required number of cells for larger scale application, becoming technically and economically unfeasible for more advanced clinical trials and product commercialization. Some of the issues related to cell culture on a larger scale will be discussed, with a view to increasing

patients' access to regenerative medicine approaches involving cellularized biomaterials.

Dr. Alicia S. Lorenti

Jefe Terapias de Avanzada, Laboratorio Pablo Cassará, Buenos Aires, Argentina

Desafíos de la Medicina Regenerativa/Ingeniería de Tejidos (MR/IT)

Los objetivos de las nuevas tecnologías de MR/IT tienen como pilares fundamentales las células y los biomateriales, y constituyen el centro de atención de numerosas investigaciones. Sin embargo, cuando el objetivo de la investigación es la translación de un producto conteniendo células y biomateriales a su aplicación clínica (“bench to bedside”), es fundamental identificar y tener en cuenta aspectos clave, que exceden los desarrollos in vitro, y que incluyen temas técnicos (relacionados con la obtención, manipulación y bioseguridad en el uso de células y tejidos, como también la obtención, toxicidad y compatibilidad de los materiales en consideración), éticos (relacionados con el origen y utilización de las células, la necesidad el consentimiento informado, entre otros), y regulatorios (particulares de cada país, definen desde las condiciones del espacio físico de trabajo, hasta los atributos de calidad del producto). Son quizás, los temas menos “atractivos” pero muy importantes para asegurar un verdadero compromiso en la búsqueda de la seguridad y eficacia de los productos, en beneficio de los pacientes.

Dr. Paulo Henrique de Souza Picciani

Instituto de Macromoléculas Professora Eloisa Mano – Universidade Federal do Rio de Janeiro (IMA/IFRJ), Brazil

“When nanotechnology meets Tissue Engineering: potentialities and perspectives”

Nanotechnology is currently a multidisciplinary and interdisciplinary branch of science that can produce and manipulate a variety of materials down to the nanoscale, i.e. below 100 nm. Nanomaterials are applied for a diversity of purposes and many of them have no related properties compared the bulk, macroscopic, materials. In the field of tissue engendering, nanomaterials can be applied to cell adhesion, morphology, viability, genetic regulation, apoptosis, and motility. New nanofabrication techniques can also control the local cellular microenvironment, produce nano-to-micro interconnectivity, and deliver drugs or bioactive agents to control cellular behavior. However, many relevant questions can be raised on the use of nanomaterials for tissue engineering, including scale-up possibilities, cost-effective processes regulatory issues, and environmental impacts. In this presentation, some of these relevant questions will be presented and discussed.

Dr. Joaquim Vives

Blood and Tissue Bank, Musculoskeletal Tissue Engineering Group, Vall d'Hebron Research Institute (VHIR), Barcelona, Spain.

"Towards a cell and tissue engineering platform to ensure rapid and sustainable patient access to innovative treatments"

Blood, tissue and cell establishments (BTCs) stand out in the management of donor selection, procurement and processing of all types of substances of human origin (SoHO). In the last decades, the framework created around BTCs, including hospitals and national health system networks, and their links to research, development and innovation organizations and agencies have spurred their involvement in the study of groundbreaking advanced therapy medicinal products (ATMP), including Tissue Engineering Products. To further improve strategic synergies in the development of ATMPs, it will be required to create an international network involving BTCs and major stakeholders (i.e., research organizations, hospitals, universities, patient associations, public agencies). We will present our ethically responsible management model based on the values and missions of BTCs and their commitment to health equity, patient access and education (based on voluntary donation of SoHO to address unmet clinical needs, while contributing to training professionals).