conferenceseries.com

J Bioengineer & Biomedical Sci 2016, 6:5 (Suppl)
http://dx.doi.org/10.4172/2155-9538.C1.015

3rd International Conference on

Medical Physics & Biomedical Engineering

November 07-08, 2016 Barcelona, Spain

Functionally designed scaffolds for biomedical applications

Henrique de Amorim Almeida
Polytechnic Institute of Leiria, Portugal

Tissue engineering represents a new, emerging interdisciplinary field involving combined efforts of biologists, engineers, material scientists and mathematicians towards the development of biological substitutes to restore, maintain, or improve tissue functions. Most strategies in tissue engineering have focused on using biomaterials as scaffolds to direct specific cell types to organize into three-dimensional structures and perform differentiated functions. The three most common strategies which have been adopted for the creation of new tissues are: Self-assembly cells, acellular scaffolds and cell-seeded temporary scaffolds. Scaffolds provide temporary mechanical and vascular support for tissue regeneration while shaping tri-dimensional in-growth tissues. Therefore, scaffolds should be biocompatible, biodegradable with appropriate porosity, pore structure, pore distribution, optimal mechanical and vascular behavior and optimal cell mechano-biological stimulation. The design of optimized scaffolds based on the fundamental knowledge of its macro and microstructure is a relevant topic of current research works. Besides presenting a general overview of current numerical scaffold design methodologies, this presentation also explores the use of biomimetic based designs combined with topological optimization schemes. A brief overview of other numerical research works in the field of scaffold design will also be presented such as the mechanical and vascular prediction of polymer degrading scaffolds.

henrique.almeida@ipleiria.pt

Advanced technology and innovation in radiation oncology

Kiki Theodorou
University of Thessaly, Greece

Radiation therapy has advanced dramatically in the past few decades and the rate of change is increasing rapidly. Innovations as a result of engineering and computer advances along with conceptual advances are making a dramatic difference. Some of the new technologies include improved computer assisted treatment planning (smarter and faster and has more capability like auto-contouring, smart segmentation and improved algorithms), continuous imaging guidance (fluoroscopic, stereoscopic, and cone beam CT), robotics, more precision, higher dose rates, gating of the beam to track moving targets, stereotactic treatments and hypo-fractionation (or giving much larger doses fewer times)- all with the goal of greater efficacy, less side effects and less time under treatment. The main purpose of this presentation is to discuss the principal areas of development of radiation therapy taking into account the whole chain from imaging to dose delivery. Multi-parametric imaging, including advanced MRI techniques, 4D treatment delivery, adaptive radiotherapy techniques and solutions, dose enhancement, including the use of nanoparticles, radiobiological optimization and advanced in hadron therapy are some of the fields that will be presented. Finally, key parameters such as cost/time/efficiency as well as QA for patient safety will be discussed.

ktheodor@med.uth.gr