

International Conference and Exhibition on

Pediatric Oncology and Clinical Pediatrics

August 11-13, 2016 Toronto, Canada



Georgios Stamatakos

National Technical University of Athens, Greece

The onco simulator - Combining clinically driven and clinically oriented multi-scale cancer modeling with information technology in the *in-silico* oncology context

In silico medicine, an emergent scientific and technological discipline based on clinically driven and oriented multi-scale bio-modeling, appears to be one of the latest trends regarding the translation of mathematical and computational biological science to clinical practice through massive exploitation of information technology. *In silico* (i.e. on the computer) experimentation for each individual patient using their own multi-scale biomedical data (molecular, histological, imaging etc.) is expected to significantly improve the effectiveness of treatment since reliable computer predictions could suggest the optimal treatment scheme(s) and schedules(s) for each separate case. The Onco-simulator is an information technology system simulating *in vivo* tumor response to therapeutic modalities within the clinical trial context. The major components, the mathematical approaches and techniques and the function of the technologically Integrated Onco-simulator (IOS) and the Hyper-model based Onco-simulator (HOS) developed within then the framework of several large scale European Commission co-funded projects including ACGT, p-medicine and the EU-US project CHIC are outlined. The technology modules include inter alia multi-scale data handling, image processing and execution of the code on the grid/cloud and visualization of the predictions. IOS and HOS appear to be the first worldwide efforts of their kind. In the pediatric oncology context a nephroblastoma, a glioblastoma and acute lymphocyte leukemia onco-simulators are currently undergoing clinical validation within the framework of real clinical trials. Indicative results demonstrating various aspects of the clinical adaptation and validation process are presented. Completion of these processes is expected to pave the way for the ultimate clinical translation of the systems.

Biography

Georgios Stamatakos received the Diploma degree in Electrical Engineering from the National Technical University of Athens (NTUA), Greece, the MSc degree in Bioengineering from the University of Strathclyde, Glasgow, UK and the PhD degree in Physics from NTUA. He is a Research Professor at the Institute of Communication and Computer Systems (ICCS), NTUA. He is the Founder and Director of the *in Silico* Oncology and *In Silico* Medicine Group. He is the coordinator of the EU-US large scale integrating research project "CHIC: Computational Horizons in Cancer: Developing Meta- and Hyper-Multiscale Models and Repositories for *In Silico* Oncology" FP7-ICT-2011-9, (600841).

gestam@mail.ntua.gr