

Dr. Paolo Vicini
Research Fellow
Pfizer Worldwide Research & Development

Title: "Describing, Interpreting and Predicting Biology: The Evolving Role of Modeling and Simulation in Translational Research"

Abstract: Biomedical modeling and simulation has a long and distinguished history. Earlier approaches focused on mechanistic descriptions of integrative physiology and biology systems, most often emphasizing specific segments of the complex cells-to-human multiscale functional continuum. In parallel with a revolution in computer hardware and software, and alongside with the availability of advanced bioanalytical techniques, biologically motivated modeling and simulation has become increasingly sophisticated. Its reach broadened from describing biological and biomedical observations to aiding in their interpretation. The next step, forward prediction, is a very important role for computer models to maximize their usefulness and impact. One of the activities where this is most significant is during the discovery and development of novel therapeutics. Model-based drug development began with the analysis of population pharmacokinetics and pharmacodynamics in clinical trials, but its basic tenets are being applied earlier in drug discovery – witness the emerging discipline of systems pharmacology, which uses multiscale models to inform how complex systems may respond to drugs. This seminar will provide a current perspective on modern modeling and simulation approaches to translational research, with particular, but not exclusive, focus on oncology drug discovery and development. Examples will be discussed to provide practical applications.