

Seminar

“On the biophysical properties of microtubules, their technological potential and importance in health and disease ”

Jack Tuszynski

*DIMEAS, Politecnico di Torino, Torino, Italy and
Department of Physics and Department of Oncology
University of Alberta, Edmonton, Alberta, Canada*

Monday DECEMBER 10th at 12.00 room 17

Abstract – The talk will provide an overview of the many interesting biophysical and biochemical properties of microtubules. The building block of microtubules, the heterodimer of alpha and beta tubulin has been well characterized and is a target for drug discovery, which will be mentioned briefly in this talk. This will be followed by a discussion of the unique polymerization and depolymerization properties of microtubules. With the knowledge of the crystallographic structure of tubulin it has been possible to analyze at atomistic-level detail, its electrostatic properties, molecular mechanics, stability, hydrogen-bond interactions as well as conductive properties in ionic solutions. An insight into the technological and biomedical potential of microtubules and nano-engineered constructs involving microtubules and motor proteins will also be provided. Finally, the talk will discuss how microtubules play a role in health and disease. Examples of their importance in neurodegenerative diseases and cancer will be illustrated with therapeutic interventions targeting tubulin and microtubules.

Prof. Jack Tuszynski – Jack Tuszynski is presently Professore Ordinario, DIMEAS, Politecnico di Torino and Fellow of the National Institute for Nanotechnology of Canada. He is an Allard Chair and Professor in Experimental Oncology in the Department of Oncology at the University of Alberta's Cross Cancer Institute and a Professor in the Department of Physics. Professor Jack Tuszynski received his M.Sc. with distinction in Physics from the University of Poznan (Poland) in 1980. He received his PhD in Condensed Matter Physics from the University of Calgary in 1983. He was a Post-Doctoral Fellow at the University of Calgary's Chemistry Department in 1983. He was an Assistant Professor at the Department of Physics of the Memorial University of Newfoundland from 1983 to 1988, and at the University of Alberta's Physics Department from 1988 to 1990. He became an Associate Professor from 1990 to 1993 and a Full Professor in 1993. He joined the Division of Experimental Oncology at the Cross Cancer Institute as the Allard Chair in 2005. He is on the editorial board of a number of international journals including the Journal of Biological Physics, Journal of Biophysics and Structural Biology (JBSB), Quantum Biosystems, Research Letters in Physics, Water: a Multidisciplinary Research Journal and Interdisciplinary Sciences-Computational Life Sciences. He is an Associate Editor of The Frontiers Collection, Springer-Verlag, Heidelberg. He had visiting professorships in Germany, Denmark, France, Belgium, Israel and China. He has published almost 475 peer-reviewed papers, over 50 conference proceedings, 23 book chapters and 12 books; delivered over 400 scientific talks (including 150+ invited talks) on five continents. His research has been supported by numerous research grants from Canadian, US and European funding agencies. In 2005 he was appointed to the prestigious Allard Research Chair in Oncology at the University of Alberta. The \$3 million Chair is supported by the Alberta Cancer Foundation and the Allard Foundation.

The seminar is organized by the Course in Nanotechnology Engineering

Contact:

Francesca Apollonio and Micaela Liberti, 0644585374, 0644585353
francesca.apollonio@uniroma1.it, micaela.liberti@uniroma1.it

