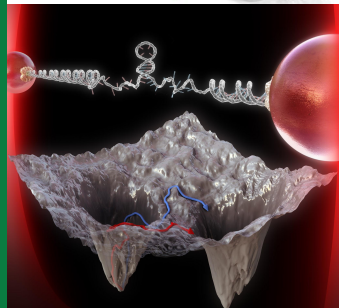
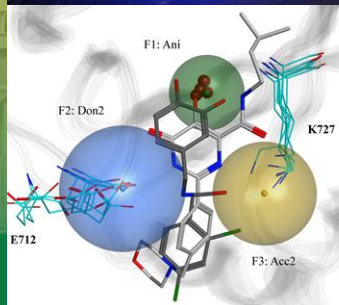
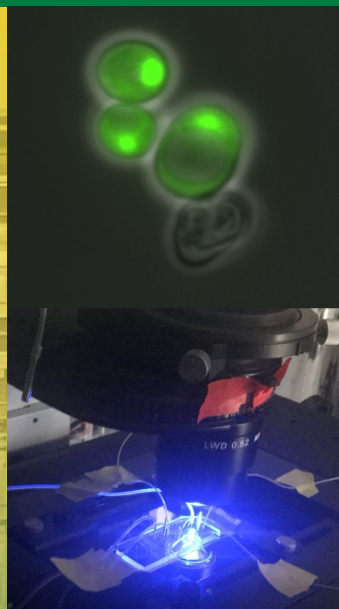


BIOPHYSICS



UALBERTA
PHYSICS

probing the physical basis of life

Biological physics uses the concepts and tools of physics to elucidate the principles and mechanisms underlying living systems, from the behaviour of biological molecules like proteins to the functioning of cells and organisms.

Research in Biophysics at the University of Alberta explores a range of theoretical, computational, and experimental problems, including how protein and RNA structures fold, mechanisms of neurodegeneration and cancer, function and evolution of gene networks, the role of quantum effects in biology, and improved methods discovering new drugs and mitigating drug resistance. These studies take advantage of tools like advanced single-molecule force spectroscopy, flow cytometry, live-cell imaging and microfluidic devices, THz laser sources, and high-performance computing facilities. Group members also collaborate extensively with colleagues in the life sciences and medicine.



Daniel Charlebois, Assistant Professor
Computational & Experimental Biophysics

Dr. Charlebois' lab is part of a cutting-edge research program that combines computation and experiment at the interface of physics and biology. He is developing spatial cell population simulation algorithms, investigating the effects of the physico-chemical environment on synthetic gene networks, and mitigating drug resistance in pathogens.

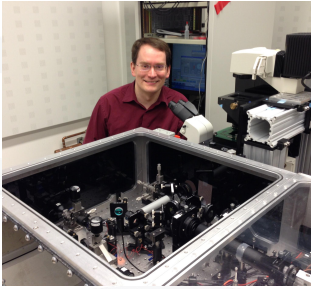
dcharleb@ualberta.ca |
www.ualberta.ca/~dcharleb

Jack Tuszyński, Professor
Theoretical & Computational Biophysics

Dr. Tuszyński studies diverse theoretical and computational problems in biophysics, from drug design and discovery in cancer and neurodegeneration to electrical signaling in cells and quantum biology.



jackt@ualberta.ca |
www.pharmamatrix.com



Michael Woodside, Professor
Experimental Biophysics

Dr. Woodside explores how the folding of proteins, and DNA/RNA relates to biological function and disease. Using state-of-the-art laser tweezers and fluorescence assays combined with ensemble biophysical and biochemical approaches, his lab explores the fundamental physics of folding and test theory, how evolution shapes folding via *de novo* protein design and ancestral protein reconstruction, probes viral RNA structures that recode gene expression, and studies misfolding mechanisms in neurodegeneration and tests possible drugs.

michael.woodside@ualberta.ca |
spaces.facsci.ualberta.ca/woodside



Additional researchers in Biophysics include:

- **Frank Hegmann, Professor**
Experimental Biophysics
Ultrafast terahertz science and nanophysics
hegmann@ualberta.ca
www.hegmannthz.wordpress.com



**UALBERTA
PHYSICS**

BIOPHYSICS

Office of Graduate Studies - Physics
physgradprogram@ualberta.ca
(780) 492-5286