UNIVERSITY OF WARSAW | CeNT CENTRE OF NEW TECHNOLOGIES

invites to a seminar by

Dr. Łukasz Szatkowski,
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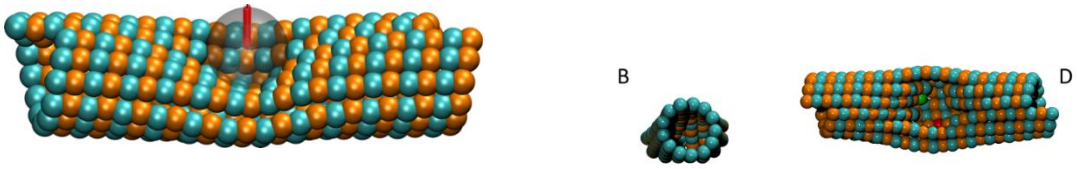
“ Mechanical stability of microtubule lattices - molecular dynamic indentation studies“

Date: January 14th, 2019 at 12 p.m.

Venue: Centre of New Technologies, Banacha 2C,
Lecture Hall 0142 (Ground floor)

Host: dr hab. Joanna Sułkowska



Abstract:

Microtubules (MTs) are made of tubulin heterodimers joined longitudinally into protofilaments (PFs). Typically, in cells 13 PFs associate laterally to form the hollow cylinder of an MT called the B-lattice. The MT filament is not a perfect cylinder as it contains one A-lattice lateral interface called the seam. During cellular processes such as mitosis, MT breakage is induced by microtubule-severing enzymes. Due to the high complexity of MTs, experimental techniques are not able to differentiate which of the A/B lattices is the "sweet spot" for the binding of these enzymes.

We probed the mechanical stability of the various MT lattice interfaces using coarse-grained indenting molecular dynamics simulations. For both lattices we found that the computationally predicted breaking forces, bending angles distributions, and MTs length factors are comparable with experimental data obtained from *in vitro* severing assays and AFM experiments. Thus, the differences in the behavior of the lattice interfaces revealed by our simulations can address the binding site controversy.

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