MPIDS Colloquium

MAX-PLANCK-GESELLSCHAFT

How to build a biological nanomachine

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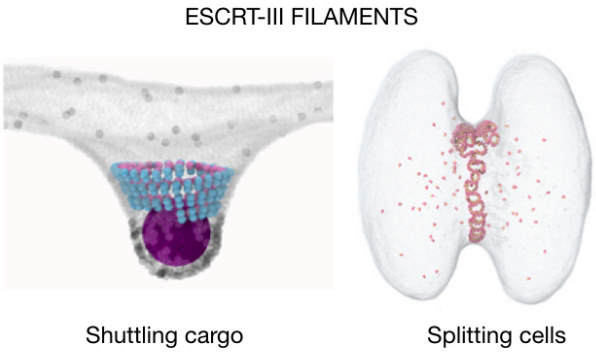
The molecular machinery of life is largely created via self-organisation of individual molecules into larger-scaled functional structures. Such processes are multiscale in nature and constantly driven far from thermodynamic equilibrium. Our group develops minimal coarse-grained computer models to help understand how the assembly of a large number of macromolecules results in a functional nanomachine, as well as how such processes can go wrong, leading to diseases.

Here I will discuss the physical mechanisms behind a key biological nanomachine that operates via protein assembly – active elastic ESCRT-III filaments that remodel and cut cell membranes and split cells in two. I will discuss the development of the model via observing nature, the simulation results, and the mapping of the simulation data to *in vivo* experiments. Then I will discuss an inverse problem — using artificial intelligence to agnostically design nanostructures for desired functions. Beyond their biological context, our findings can guide the design of artificial structures that are able to manipulate cell membranes and perform work at the nanoscale.



Wednesday, April 22nd, 2020 at 2:15 pm

MPIDS, video conference

www.zoom.us Meeting ID: 924 0678 3981, Password: 564072

https://zoom.us/j/92406783981?pwd=ZXlmSG5OeFZPeEV-ZdDdFSlFsTU4zZz09

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