PhD Position in Theoretical Biophysics

Computer simulations of mRNA and lipid nanoparticles

The Max Planck Institute of Biophysics, Department of Theoretical Biophysics has one open PhD position within the Emmy Noether Research group (Schwierz-Neumann). The work focuses on computer simulations of mRNA and lipid nanoparticles.

Lipid nanoparticles are smart multifunctional carriers that can be used to transport RNA based drugs in medical applications. Characterization of the structure of the nanoparticles and the RNA molecules is essential to understand their interactions and therapeutic function. In order to gain detailed insight, we combine computational methods and SANS/SAXS measurements (performed by our collaborators in Munich and Sweden).

In the PhD project, a consistent bottom-up modeling approach will be developed. Hence, secondary structure prediction tools, all-atom and coarse-grained molecular dynamics simulations are used to gain atomistic insight into secondary structure formation of mRNA at cationic lipid surfaces. Subsequently, the dependence of secondary structure formation of mRNA on the electrostatic environment, the membrane composition, the salt concentration and the pH is investigated.

Candidates with background in statistical and soft matter physics and expertise in methods such as all-atom molecular dynamics simulations, high performance computing, advanced sampling techniques, and programming are highly encouraged to apply.

Applications including CV, cover letter, and one letter of reference should be send electronically to:

Dr. Nadine Schwierz-Neumann
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Additional information:
www.biophys.mpg.de/schwierz

The Max Planck Society is an equal opportunity employer, and particularly encourages female applicants. It also tries to increase the proportion of scientists with physical disabilities. Respective applications are welcome.