

A3: Statistical Physics of Biological Systems

J. Franke, N. Riedel, A. Nourmohammad

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Aim of the workshop is to present some of the many interesting applications of theoretical physics and in particular statistical mechanics in biological systems.

After a very brief introduction to the underlying molecular mechanisms, three areas of application will be discussed. These include (i) distinguishing different cell type activities (e.g. cancer vs. healthy cells), (ii) the application of information theory in genomics (e.g., immune system) and (iii) functional understanding of molecular motors, i.e. motors made up of very few molecules, acting on sub-cellular scales and performing complicated tasks.

The tentative schedule is

15:00-15:20 Introduction to the molecular machinery (J. Franke)

15:20-16:00 Statistical mechanics of sample deconvolution (N. Riedel)

16:30-17:00 Application of information theory in genomics (A. Nourmohammad)

17:00-17:45 Single molecule analysis and molecular motors (B. Maier)