

Student projects: To bind or not to bind?

Construction of multivalent proteins via DNA nanostars

We want to study the binding behaviour of multivalent proteins by using an inert protein that is connected to a DNA nanostar. With this technique we can precisely control the number of DNA strands per protein. The project will consist of the design and production of the nanostars and attachment to the green fluorescent protein (GFP).



Figure 1 Nanostars with three or four arms, respectively [1].

[1] Phase behaviour and critical activated dynamics of limited-valence DNA nanostars, S. Biffi, R. Cerbino, F. Bomboi, E. M. Paraboschi, R. Asselta, F. Sciortino and T. Bellini, PNAS 110 (39) 15633-15637, 2013.

We look for a motivated student who is interested in biophysics and who would like to work on multidisciplinary experimental research combining knowledge from Chemistry, Biology and Physics. Besides sample preparation (lipid membrane, DNA, flow channel), you will get experience in fluorescence microscopy (spinning disk, TIRF) and image analysis (ImageJ, Python).

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