Journal Club on 'Nanoscale rotary apparatus from tight-fitting 3D DNA components'[3]

Holger Flechsig

2016/05/27

Abstract:

The importance of DNA molecules as carrier of genetic information is known to everyone. On the other side their intrinsic properties to self-organize and assemble into stable structures provides interesting applications in nanotechnology. In the last decade remarkable progress has been achieved by using DNA as building blocks to fabricate custom-shaped nanoscale objects, employing techniques known as DNA origami (introduced in the pioneering work [1]). The Dietz lab at TU Munich [2], Germany, has made major contributions in the field. Recently they have reported the design of a nanoscale rotary device built from DNA [3], which was inspired by the F1-ATPase molecular motor. The fabricated prototype machine performs rotary Brownian motion and indeed reveals some rough similarities with dynamical properties of the F1 motor. I will briefly explain the concept of DNA origami and then proceed to discuss the recent findings.

References:

1. Rothemund PWK (2006) Folding DNA to create nanoscale shapes and pattern. Nature 440: 297

2. http://bionano.physik.tu-muenchen.de/

3. Ketterer P, Willner E, Dietz H (2016) Nanoscale rotary apparatus formed from tight-fitting 3D DNA components. Science Advances 2: e1501209