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Multimerization of DNA Origami Structures in Two Dimensions[1]

DANIEL SCHIFFELS, Ludwig-Maximilians-Universität München, DEBORAH FYGENSON, University of California Santa Barbara, TIM LIEDL, Ludwig-Maximilians-Universität München — DNA nanotechnology, here in particular DNA origami, is based on self-assembly and can be used to construct arbitrary three-dimensional structures with nanometer precision. The dimensions of such DNA origami structures are typically on the order of a hundred nanometers or smaller. To achieve large-scale two-dimensional lattices that could be employed as scaffolds for crystalline arrangement of biomolecules and proteins, individual DNA origami tiles need to be assembled hierarchically. We work on the multimerization of DNA origami structures into extended one- and two- dimensional lattices that can cover areas of several square micrometers. This is achieved by complementary single stranded DNAs (sticky ends) at specific positions on the DNA origami objects that we intend to grow into periodic structures. We study the effect of varying multimerization conditions such as annealing temperatures, length of sticky ends and salt concentration on the quality and size of the resulting lattice.

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