INTERACTIONS OF DNA ORIGAMI STRUCTURES WITH SOLID SUBSTRATES – THE BASIS FOR NANOINTEGRATION AND BIOMANIPULATION

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The precise immobilization of DNA nanostructures on a surface is a key step for the integration of DNA-based material in nanotechnology for electronic or sensorical applications. Thereby the arrangement and distribution at the substrate surface is of growing interest. This issue can be addressed by top-down approaches such as lithography, but they show certain limitations regarding costs and/or throughput. So self-assembly processes are in the focus, because they have the potential to overcome these limitations.

First we present a self-assembly effect observed when already immobilized and dried origami preparations were again rehydrated under certain conditions, resulting in a certain ordering of densely packed origami structures. We investigate the influence of different parameters in order to reveal the underlying mechanisms.

Furthermore we study the ratio between intramolecular and surface-attachment interactions while executing DNA manipulation experiments by AFM.

Understanding the involved parameters allow us to control the process of interest. This knowledge opens the door for an additional DNA integration tool.

**Keywords:** DNA Origami, immobilization, self assembly

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