

Combination of Layer-by-Layer Microcarriers and DNA Origami

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Structured drug delivery systems may offer new and promising approaches for specific transport and release of active agents. In our investigations, two different approaches will be combined: Layer-by-Layer (LbL) particles and DNA origami nanostructures. The LbL technique uses microparticles which are alternately coated with biopolymers to produce a multifunctional layer structure. Core, layers and surface can be independently equipped with different functional molecules or nanoparticles [1]. Alternatively, nano-sized DNA Origami structures such as hollow cubes or tubes provide the opportunity to encapsulate active agents and trigger their release by a controlled opening of an attached lid [2]. Combining both, the DNA Origami and the LbL technique, is therefore promising for the development of even more sophisticated drug delivery systems. Here we illustrate the successful integration of DNA origami cage structures onto biopolymer LbL carrier microparticles. We demonstrate a very high coating yield of the carriers with the DNA nanostructure. Furthermore, we provide evidence that the origami cage preserves its structural integrity after the coating procedure.

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[2] R.M. Zadegan, M. D. E. Jepsen, K. E. Thomsen et al., *ACS Nano*, **2012**, 6 (11), 10050-10053