**DNA-Powered Microactuation of Self-Folding Thin Film**

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DNA conjugated gold nanoparticles (DNA-GNP) self-assemble to form aggregates by sequence-specific DNA hybridization. These aggregates can change their form by stretching, shrinking, folding or melting of DNA duplexes, offering great opportunities for designing functional materials. Here, I report the formation of micro-patterned, multi-layered DNA-GNP devices made by Layer-by-Layer (LbL) deposition. Freestanding DNA-GNP films are released from the substrate, and mechanically actuated by reversible DNA hybridization of each layers, respectively. DNA-GNP microstructure is actuated by active DNA-GNP layer whose volume can be reversibly modulated by DNA hybridization of a single stranded gap domain bridging between particles. As a result, bilayer DNA-GNP microstructure with active and passive layers shows reversible folding by DNA hybridization. Finally, dual active DNA-GNP microstructure show programmed folding by independently addressable DNA hybridizations.