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Liquid Supramolecular NanoStamping (LiSuNS) ARUM AMY YU, Massachusetts General Hospital, FRANCESCO STELLACCI, MIT — The development of high resolution bio-devices has generated a demand for the development of novel printing techniques able to minimize fabrication time and labor. Supramolecular NanoStamping (SuNS) is a stamping method that can copy single-stranded DNA features in a sequence specific way in only three steps: a master containing single stranded DNA features is immersed in a solution of complementary DNA (cDNA) molecules modified with a chemical group at the end (Hybridization). Another substrate is placed onto the hybridized master so that a chemical bond can form between cDNA and the secondary substrate (Contact). The two substrates are then separated by heating or mechanical force and a copy composed of cDNA is left on the secondary substrate (Dehybridization). However, like all other contact printing techniques, SuNS' efficiency highly depends on the roughness of the substrates used. Here, we present an extension of SuNS, Liquid Supramolecular NanoStamping (LiSuNS). LiSuNS eliminates the need of contact between two solid substrates by introducing a liquid prepolymer that is cured after contact. Using LiSuNS, we achieved large coverage >10cm^2. Moreover, because LiSuNS prints 3-D physical information as well as 1-D chemical information (i.e DNA sequences), it can be used to generate a complete DNA-based bio-device with 3-D physical shape (e.g. channels) and chemically modified patterns.

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