Direct Synthesis of Functional Materials *via* Chemical Contrast *In Situ* Growth

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ABSTRACT:

Nanostructured surface engineering holds incredible potential to provide new solutions for efficient optical and communication devices, long-lasting batteries, and ultrasensitive diagnostic devices. Many of these technological advances are rooted in a tight control of the physicochemical environment at the nanoscale, including specific crystallographic habits, precise 3-dimensional position of various components, orientation of coating (bio)molecules on the surface, and the presence of complementary chemical functionalities.[1–3] In this talk, I will introduce the concept of Chemical Contrast *in Situ* Growth, a site-directed growth approach based on a reductant chemical ink and a sacrificial stencil capable of producing nanscaled ordered plasmonic arrays over hundreds of microns squared in a single step and within minutes.[4,5] Taking advantage of the capability of soft-lithography to fabricate almost unlimited complex growth patterns with advanced plasmonic properties, we demonstrated the preparation of plasmonic square arrays of different lattice parameters capable of sustaining collective lattice plasmon resonances. Overall, our work opens the door to the rational design of addressable nanostructures in a time-efficient and scalable manner, avoiding colloidal pre-synthesis, self-assembly, top-down lithography, and clean-room processing, fostering the creation of new architectures and functionalities for photoelectrocatalysis, non-linear optics, energy production and storage, and cellular biology.

References:

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