

Gradient Droplet Arrays Created by Dip-Coating

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Project description:

Creating arrays of chemicals, proteins, and cells is of great interest as it allows for simultaneous monitoring of several reactions. Previously, the pipetting technique has been widely used to create such arrays, but recently more sophisticated methods for rapid array creation have been developed. The general tendency has been to break the sequential process of the pipetting technique in favor of a parallel approach in order to save time and effort. This has been achieved by making spatial variance in both surface chemistry and structures, so that some superhydrophobic regions are shedding water, while other hydrophilic regions are pinning. The pinning regions get wetted, while the shedding regions stay dry, leaving behind the desired array pattern.

Content:

Fabrication of biphilic surfaces: Using UV lithography and Molecular Vapor Deposition, the water adhering regions are defined on a water repellent background. Cleanroom experience is preferred but not required. **Characterization of droplet arrays:** A first version of a dip-coating setup has already been build using LEGO Mindstorm. The Mindstorm is to be programmed to perform the dip-coating experiments. The droplet array will be characterized as a function of dip-coating and array parameters, which is done using weighing or optical methods. Furthermore, demonstrations of various applications will be performed.

The successful project will result in a publication.

