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Title: Bioinspired Functional Surfaces for Technological Applications

Abstract: Biological surfaces are the important active interfaces between biological matters and the environment, and have been evolving over time to a higher state of intelligent functionality. Bioinspired surfaces with special functionalities (eg. wettability, unique morphology) have grabbed attention in materials research in the recent times. The microstructures and mechanisms behind these functional biological surfaces with interesting properties have inspired scientists to create artificial materials and surfaces which possess the properties equivalent to their counterparts. In our work, we have described the interplay between unique multiscale (micro- and nano-scale) structures of biological surfaces with intrinsic material properties which can be used to achieve the desired functionalities. We have made use of the natural leaf surfaces by employing advanced fixation techniques for surface preservation and also replicated these surfaces by soft lithographic methods. These strategies collectively enabled functional surfaces to be utilized in different applications such as fog harvesting, surface enhanced Raman spectroscopy (SERS), catalysis, sensing and heat transfer applications, where material science and engineering have merged by taking inspiration from the natural systems.