

ABSTRACT:

Functional Surfaces by Combining Composite Soft Membranes with Biomolecules and Catalytic Nanocapsules

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Smart functional surfaces based on flexible membranes combined with active assemblies are in the limelight because they offer the potential to develop solutions for biosensing or advancement of catalytic reactions on surfaces with time and space precision at the nanoscale. Here we present two approaches to generate functional surfaces based on composite soft membranes. In the first approach, we generate nano-textured surfaces in a controlled manner, by developing fully synthetic soft planar membranes from binary mixtures of amphiphilic block copolymers [1]. The fine tuning of the domains supports specific combination with antimicrobial peptides resulting in efficient surfaces to fight bacteria growth [2]. In the second approach, we introduce hybrid membranes based on the insertion of resocinarene monomers, that are self-assembling in situ into functional capsules, into synthetic flexible membranes [3]. We adjusted the conditions to allow the resocinarene monomers to avoid the polar environment of the hydrophilic domain of the planar membrane and to self-assemble into capsules. Such hybrid membranes have the ability of specific small molecule uptake, storage, and potential for cross-membrane transport.

References

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