

## Facile and Various Fabrication of Robust Superhydrophobic Surfaces Utilizing Mussel Adhesive Protein and its Biomedical Applications

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By combining the characteristics of three natural species, biocompatible and robust superhydrophobic surface was synthesized by various strategies combining the the characteristics of three natural species, including Lotus leaf, mussel, and sandcastle worm. Synergistic effects of intrinsic material properties of MAP, underwater adhesion and positive charge, and physiochemical properties of sandcastle worm, water-immiscibility, were feasible to coat thin and uniform layer by dipping immiscible MAP adhesive into the dissolved nanoparticles of SiO<sub>2</sub> and TiO<sub>2</sub> using electrostatic attraction. Using these properties, a robust superhydrophobic (SH) SiO<sub>2</sub>(TiO<sub>2</sub>/SiO<sub>2</sub>)<sub>n</sub> thin coating which represent anti-thrombotic property when applied to the catheter was formed without substrate restriction. Furthermore, the robust SH/MAP patch which possesses anti-biofouling and biocompatible tissue closure characteristics was prepared by simply spraying the hydrophobic SiO<sub>2</sub> nanoparticles onto the MAP-covered patch. Also it was actually attached to a human hand to confirm the blood-repellency.