

## Bioengineered Mussel Protein-Based Functional Adhesive Platform for Dental Implant Applications

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Dental implants have been widely used as a common treatment modality for replacing missing teeth, and implant survival is now highly reliable. Despite the favorable clinical results, insufficient osseointegration and unexpected marginal bone loss remain as challenges. To address these issues, we proposed a functional adhesive platform for dental implants by utilizing bioengineered MAPs as a core material for exhibiting superior adhesive ability and biocompatibility, as well as the desired bioactivity. The R5-MAP-based silica nanostructure coating and MAP-RGD-based bone tissue adhesive can be practically applied to accelerate osseointegration of dental implants. The MAP-VEGF-based porous microspheres can be utilized as excellent source of stem cell therapy for reconstruction of peri-implant bone defects. The MAP-Ag4-based silver nanoparticle coating has a great potential to be used to prevent bacterial infection of dental implants. We expect that the MAP-based adhesive platform could be applied in combination, thereby reducing premature implant failures and also extending overall implant lifetimes.