Co-electrospinning of silk fibroin and mussel adhesive proteins for advanced nanofiber scaffold

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Brand-new ideas with silk materials have enabled to widen applications. However, relatively poor biodegradation and cell adhesive ability have hindered its wide range of application for cell and tissue engineering. Here, we attempted to improve characteristics of silk fibroin by introduction of recombinant mussel adhesive proteins (MAPs). Mussel can strongly affix to the wet surfaces and maintain its adhesive force and flexibility even under harsh conditions. Previously, we successfully mass-produced recombinant MAP in *E.coli* system and constructed RGD peptide-fused recombinant MAP as a new cell adhesive which leads better cell attachment, spreading, proliferation, and even differentiation. By co-electrospinning of MAP-RGD with silk fibroin, we fabricated nanofiber sheet as tissue engineering scaffold and investigated cell behaviors on the constructed nanofibrous scaffold. Above all, the constructed nanofibrous scaffold of silk fibroin/MAP has a lot of potentials for functionalization of biomolecules without complicate modification of scaffold surface.