

Tuning Biomaterial Interfaces for Controlled AAV Delivery Systems

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Biomaterials based gene delivery systems have the crucial potential to enhance the therapeutic with satisfying efficacy and safety issues (i.e. minimum off-target). For loading of gene delivery vectors into biomaterials, however, the previous systems (i.e. anti-body immobilization) showed the limitations to apply general gene delivery vectors (i.e. limited vehicles). Herein, we developed the tuning interface technique to induce specific interactions with adeno-associated virus (AAV) on any biomaterial's surfaces. Universal AAV binding recombinant protein was manufactured and purified including thiol-malimide based "click" chemical linker. This novel functional protein based tuning interfaces were showed the in vitro sustained release profiles and in vivo localized delivery of universal AAV serotypes without off-target gene expression. This tuning biomaterials platform technique for AAV delivery systems could be used to next-generation gene-cell therapy (i.e. targeted/localized in vivo genome editing).