

Adeno-associated viral gene delivery system for efficient human neural stem cell infection by bioinspired catecholamines

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The development of gene delivery systems is a critical issue for the advancement of therapeutic techniques in the fields of gene therapy and tissue engineering. Substrate mediated gene delivery system is utilized to enhance gene delivery efficiency by localization of bioactive materials on the substrates. It promotes retained gene transfer effectively and induces enhanced gene delivery efficiency. In this study, we employed catecholamine polymers, poly(norepinephrine)(pNE) and poly(dopamine)(pDA) for immobilizing AAV vectors on solid surfaces. The catechol group of pNE or pDA is mimicked of adhesive functional groups from marine foot muscle proteins, since it is capable of surface modification with sticky property. The adeno-associated virus (AAV) is considered promising as a therapeutic vector because it is relatively safe and has the ability to target genes in stem cells. Therefore the development of surface mediated AAV vector delivery system by catecholamine materials has a great potential to apply and formation newly interface science including gene therapy engineering.