

Surface modification with adhesive materials for substrate-mediated adeno-associated viral(AAV) gene delivery

김은미, 박민아, 이슬기림, 김민희, 진규형, 박국인, 장재형*
연세대학교
(j-jang@yonsei.ac.kr*)

Gene delivery system has been developed to satisfy the delivery efficiency criteria for gene therapy and tissue engineering applications. One of the universal gene delivery system is substrate mediated gene delivery. Because this system not only reduces viral quantities compared with solution mediated gene delivery system but also enhances cell viability. Recently, AAV is widely used for the viral gene therapy in numerous treatments due to their safety and high efficiency compared with non-viral vector. However, it has limitations dealing with the stimulation of stem cells because of its low transfection efficiency and difficulty in altering cell tropism.

In this study, we developed substrate-mediated viral gene delivery system with adhesive materials on a variety of substrates. Since AAV adsorb efficiently and it is capable of localized gene delivery to cells we modified surfaces with the virus and catecholamine polymer with its sticky properties. Therefore, this system induced spatially controlled gene delivery for stem cell application. Development of gene delivery system to stem cells has an importance in the gene therapy and tissue engineering applications, due to its enormous potential to treat many incurable diseases.