Cell adhesion and gene delivery using poly(e-caprolactone) microparticles modified with catecholamines

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

Cell injection is widely used for regeneration of tissue. There are several limitations of direct cell injection to be used as an effective therapeutic tool, including severe immunoreaction and low survival rate of the injected cells. To overcome, many alternatives have been researched including cell encapsulating hydrogel. Herein we developed biodegradable poly(e-caprolactone) microparti-cles as cell carriers whose surface were modified with catecholamine derivatives(i.e. poly(norepinephrine) and poly (dopamine)) for mechanical support for effective adhesion of cells and viral vectors. Adeno-associated virus(AAV), known as non-pathogenic, safe, and efficient in human neural therapy, was employed as gene vector. AAV is adhered on the surface of catecholamine-coated microparticles. After the particles are coated with the viral vectors, cells are attached on the particle by the "stickiness" and then the viral gene can be delivered. Combinatorial utility of catecholamine-coated cell carriers, viral vectors and human neural stem cells can have a great potential for treatment of Parkinson's diseases, stroke, or other ischemic brain diseases.