# Heparin-coated superparamagnetic nanoparticle-mediated adeno-associated virus delivery for decreasing the time of cellular transduction

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Gene delivery vectors based on adeno-associated virus (AAV) are highly promising due to several desirable features of this virus thatissuitablefor the delivery of foreign genes into both dividing and non-dividing cells. This study describes a new method involving adsorption of AAV to heparin-coated superparamagnetic nanoparticles (HpNP) to infection. AAV-HpNPs were employed to transduce cells on the magnetic field.Infectivity was changed by Magnetic exposure time and AAV with varying ratios of HpNP. This system enables to transduce the cells by similar gene expression level of the typical bolus method even in very short time, 1/8 of bolus. The magnetofection using AAV-HpNPs showed the transduction efficiency increase without compromising the cell viability. Neurite outgrowth in PC12 cells is significantly increased by AAV that encode NGF production-HpNP. AAV-HpNP using limited magnetic field area resulted in site-specific localization of transgene expression. AAV-HpNP suggested that the efficiency of therapeutic vector strategies is improved.