

The process of RNA interference (RNAi) is a natural phenomenon posttranscriptionally controlling gene expression by means of small double-stranded RNA molecules (dsRNA). Small interfering RNA (siRNA) is a small dsRNA that can be used for targeted gene silencing as an alternative therapeutic treatment of genetic diseases. For in vivo administration, siRNA must be protected against degradation to ensure its efficient delivery to target cells using sophisticated vectors. This work is focused on description of non-viral vectors based on cationic polymers, forming polyelectrolyte complexes with siRNA (polyplexes), and surface-modifying hydrophilic polymers enabling protection of the vector during its transport in the bloodstream.