Multivalent peptide functionalized nanoparticles for treatment of Medulloblastoma

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Medulloblastoma targeting and penetrating the blood brain barrier is a key bottle neck in the use of nanoparticles *in vivo*. Improving the selectivity of the nanoparticles can promote targeted drug delivery to the cancer and prevent majority of the side effects caused due to non-specific uptake. Ellipsoidal polymersomes with high density of peptide functionalization were shown to have improved selectivity and permeability up to a functionalization threshold and the stealth properties of the polymersomes were unaffected after functionlization.¹ Multivalent interactions in drug delivery systems have been studied to have enhanced cell targeting and receptor clustering.² Cancer is a disease caused by the accumulation of genetic mutations and creates a gene regulation networks specific for the growth and proliferation of cancer cells. Hence, targeting these genes using RNAi to silence genes and promote tumor regression could prove to be an effective alternate for the current treatment regimen.³ The study will also provide a deeper insight into the effects of dual functionalization on the uptake of different nanoparticles and provide valuable information on the efficient synthesis of RNAi therapeutics.



Figure 1: Functionalized nanoparticles for medulloblastoma and TEM images of siRNA-loaded ellipsoidal polymersomes

References

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