Multivalent peptide functionalized nanoparticles for treatment of Medulloblastoma

Keerthana Nakka [1,2,3,] *Chelsea R. Forest*[1,2] *Kristel C. Tjandra*[1,2], *Chin Ken Wong*[1,2], *Joshua A. McCarroll*[2,3,4], *Maria Kavallaris*[2,3,4], *Pall Thordarson*[1,2,3*]

[1]School of Chemistry, UNSW Australia, Sydney, NSW 2052, Australia,

[2]Australian Centre for Nanomedicine, The University of New South Wales, Sydney, NSW 2052, Australia

[3]UNSW RNA Institute, The University of New South Wales, Sydney, NSW 2052, Australia

[4] Children's Cancer Institute for Medical Research, Randwick, NSW 2031

k.nakka@unsw.edu.au¸ *p.thordarson@unsw.edu.au*

One major obstacle to the treatment of medulloblastoma is the inability of drugs and small molecules to cross the blood-brain-barrier. The use of nanoparticles can help overcome this owing to their small size and potential stealth properties. Increasing the nanoparticles' selectivity can help deliver drugs to cancer cells in a targeted manner and avoid most negative effects brought on by non-specific absorption. Up to a functionalization threshold, ellipsoidal polymersomes with high densities of peptide functionalization were demonstrated to have enhanced selectivity and permeability. The polymersomes maintained robust stealth characteristics post-functionalization.[1] Additionally, lipid-based nanoparticles have been investigated as possible carriers for several forms of brain cancer.[2] It has been shown that multivalent interactions improve receptor clustering and cell targeting in drug delivery systems.[3] Accumulation of genetic mutations leads to cancer, a disease that produces gene control networks tailored to the development and spread of cancer cells. Therefore, employing RNA interference (RNAi) to target these genes in order to silence them and promote tumour regression had been studied to be an efficient treatment strategy.[4] In addition, the research will shed light on how dual functionalization affects the uptake and ability of two different nanoparticles to cross the blood-brain-barrier and offer important insights into the effective production of RNAi therapeutics.

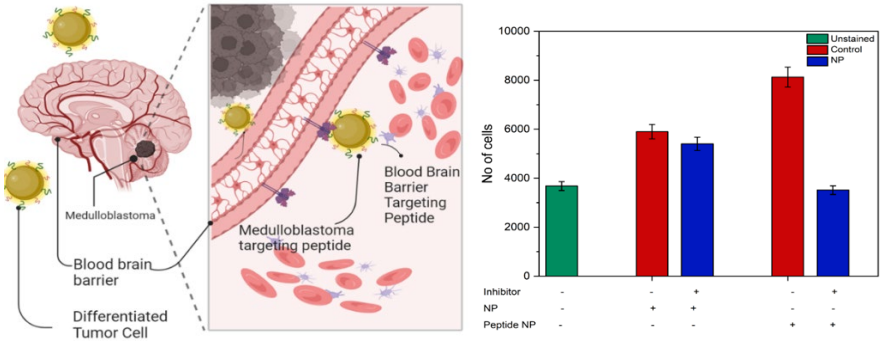

Figure 1: Functionalized nanoparticles for medulloblastoma and uptake of peptide functionalized polymersomes

References

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