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Functionalised dextran nanoparticles for drug delivery to the brain

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One of the major problems in drug delivery to the brain is the difficulty of transporting therapeutic entities across the blood-brain barrier (BBB). Consequently, the treatment of many brain-associated disorders through conventional delivery strategies is of limited value. It has been suggested that nanoparticles of poly (alkyl cyanoacrylate) (PACA) with dextran may be capable of transporting actives across the BBB. Poly (butyl cyanoacrylate) nanoparticles coated with Polysorbate 80 are biodegradable carriers that have been demonstrated to facilitate the delivery of drugs and peptides across the BBB. This study is aimed towards the formulation of amphiphilic nanocarriers from alkyl cyanoacrylate and a modified dextran for improved therapeutic delivery to the brain. Work to date has involved the derivatisation of dextran with alkyl glycidyl ethers (alkyl glycerol has been shown to aid the transport of particles to the brain) and their subsequent formulation with PACA nanoparticles. To facilitate further evaluation of their therapeutic usefulness, nanoparticles have been tagged with various fluorophores; current work is focusing on *in vitro* studies of the capability of loaded nanoparticles to act as controlled release devices.

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