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Host: Dr. Niels C. Reichardt

Glycoengineering of Extracellular Vesicles

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Exosomes and Extracellular Vesicles (EVs) in general are attracting interest as natural, biocompatible drug delivery vectors. These lipidic entities are secreted by practically all cells in culture and in a physiological context mediate intercellular communication for an incredibly broad range of functions.

In collaboration with the Exosome Laboratory of CIC bioGUNE, we have been exploring methods to alter EV glycosylation with the hypothesis that this will alter the cellular tropism of EVs and target different organs. Specifically, we utilised glycosidase enzyme treatment, small molecule inhibitors of the glycosylation pathways and the click chemistry addition of a synthetic glycodendron molecule.

Experimental proofs for successful glycoengineering were established by lectin microarray assays established by the Glycotechnology group and a suite of vesicle characterisation techniques. A range of in vitro uptake assays demonstrated the truth of our original hypothesis and gave sufficient justification to move to in vivo animal models of biodistribution. These results were at turns interesting and surprising and we are now moving to protect IP and explore the potential for commercialisation.