

Detailed Proteomic Analysis of Protein Corona on Mannose Based Glycopolymers and Their Response in Tumour Microenvironment

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It has been well studied now that tumours endure changes in their cellular metabolism¹. Tumours require excessive glucose in order to satisfy their vulnerable growth needs.² During the past few years as a family of sugars, mannose is gaining more and more interest because of its tumour suppressing capabilities³. However, nanoparticles with mannose can target cells, but they are also prone to protein corona formation. Therefore, the content of mannose needs to be carefully finetuned. Here we prepared PManMA₄₇-PS₅₁-co-PEO₄₄-PS₄₀ micelles with PManMA₄₇-PS₅₁ ranges from 0% to 100% and observed that micelles size decreases with increasing mannose content (~84 nm- 29 nm from 0%-100%). We are interested in if protein profiles changes with changing mannose content in PManMA₄₇-PS₅₁-co-PEO₄₄-PS₄₀ glycopolymers and if there is a relationship between adsorbed proteins on the cellular uptake of healthy (macrophages) and tumour cells with high mannose receptors, and what kind of proteins are adsorbing on these glycopolymers. We found out that although there is no significant difference quantitatively on the number of adsorbed proteins but there are few proteins which are specific to certain mannose ratio.

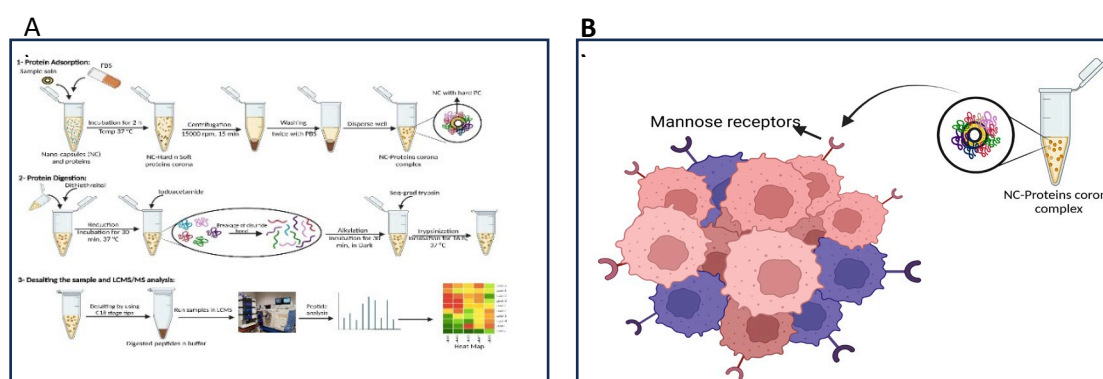


Figure 1 : Schematic Illustration of A) detailed proteomic analysis of micelles by LCMS², B) Targeting overexpressed mannose receptors in tumours

References:

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- (3) Nan, F.; Sun, Y.; Liang, H.; Zhou, J.; Ma, X.; Zhang, D. Mannose: A Sweet Option in the Treatment of Cancer and Inflammation. *Front Pharmacol* **2022**, *13*, 877543. DOI: 10.3389/fphar.2022.877543 From NLM.