

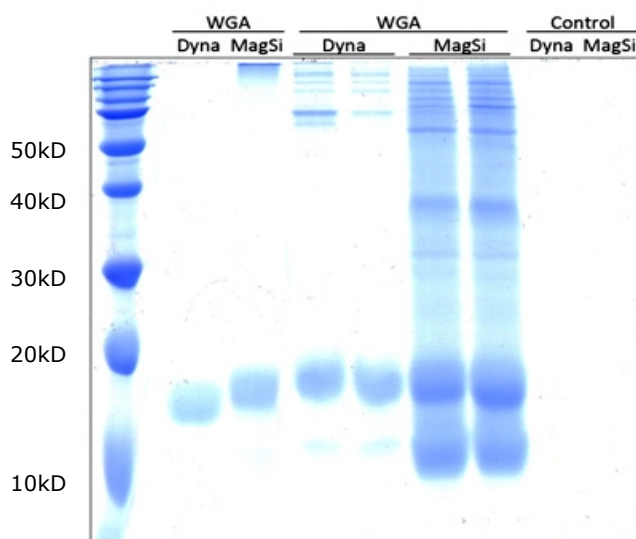
MagSi particles coated with lectins for glycoproteomics studies

Alterations in protein glycosylation occur during development and progression of many diseases including cancer, inflammation and autoimmune disease. Glycomics and glycoproteomics have emerged as important tools in glycobiomarker discovery.

The most prominent lectin for capture of glycosylated proteins is Concanavalin A (Con A). However, in total there exist a pool of apr. 20 different lectins with individual selectivity towards glycosylated structures, complementing each other. Therefore it is necessary for a representative glycoproteomics study, to include not a single (e.g. ConA) but multiple lectins for glycoprotein pullout.

Here we present a pilot study using MagSi-S NH2 1.0 magnetic particles as generic particle for covalent attachment of any kind of lectin. The wheat germ agglutinin (WGA), has been used as lectin example. Covalent attachment of WGA to tosylated Dynabeads (Dynabeads M280 Tosylactivated) and aminated MagSi-S NH2 1.0 beads have been compared. The coupling itself has been performed according to the manufactures protocols. Equal amounts of serum (50 µg serum proteins) have been applied to 5 µl of aminated MagSi beads and tosylated Dynabeads and have been incubated for 30 min. at 4°C. The binding efficiency of serum glycoproteins has been analyzed by an SDS-PAGE study (Fig. 1). The results can be summarized as following:

- 1) The WGA lectin was coupled succesfully in high yield to the MagSi-S NH2 and tosylated Dynabeads (blanc: lane 2,3).
- 2) No unspecific binding of non-glycosylated serum proteins could be detected in the controls (lane: 8,9).
- 3) The total amount of glycosylated proteins pulled out with the WGA coated MagSi beads was apr. 5 times higher compared to the tosylated Dynabeads.
- 4) Coating and blocking of the tosylated Dynabeads take apr. 40 hrs., where as the coating and blocking takes about 1.5 h using the MagSi-S NH2 coupling chemistry.
- 5) Using MagSi-S NH2 particles, it could be demonstrated that further lectins like ConA and JAC (Jacalin from *Artocarpus integrifolia*, results not shown) could be coupled sufficiently as well.



Conclusions: It could be demonstrated that the MagSi-S NH2 beads provide an effective tool for any kind of lectin based glycoproteomics study. Efficient coupling of three widely used lectins (WGA, ConA and JAC) strongly indicate that the MagSi-S NH2 particles are an superior tool for glycoproteomics studies.

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