Lectins on Beads: Selection of Glycopeptide Ligands for Galectin 1 Using OBOC Libraries

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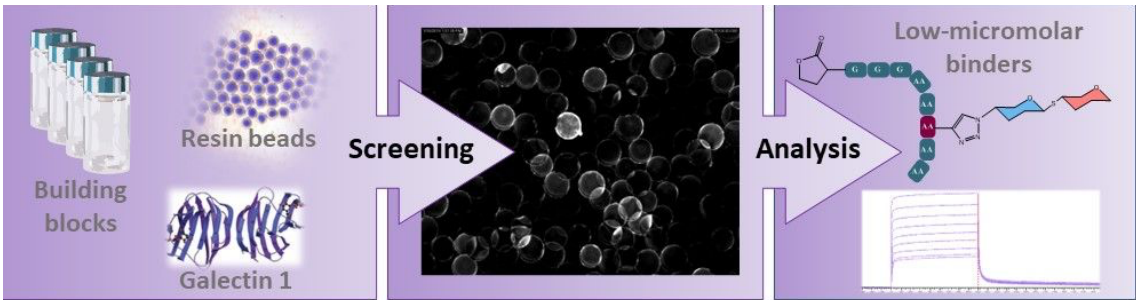
Combinatorial chemistry is an elegant concept, based on a combination of simple motifs to provide complex mixtures of target compounds – combinatorial libraries. We exploited diversity present in those libraries to create a very simplified, fractioned version of cell surface. By a combination of two powerful methods – SPPS and CuAAC [1,2] - we prepared libraries of glycosylated peptides and used them as a tool to study behavior of protein Galectin 1.

Galectin 1 is a small lectin (25 KDa) with many functions in human body [3]. Among others, Galectin 1 is expressed in cancer cells to help the tumor grow and escape our immune system, its expression is also correlated with obesity and diabetes [4]. A member of the Galectin family, Galectin 1 is a soluble protein known to bind both saccharides (Galβ1, lactose, Galβ1-4GlcNAc on cell surface glycoconjugates) and proteins.

Glycopeptide library consisting of peptides modified with S-Lactose (Galβ1-S-4Glc) was designed and screened against recombinant Galectin 1. The two-phase screening process and subsequent control experiments selected two low-micromolar binders of Galectin 1. The fact that their affinity to Galectin 1 is higher than that of S-Lactose alone confirms the role of the underlying peptide in the binding interaction.



Acknowledgements

This work was supported by the ERC under the European Union's Horizon 2020 research and innovation program (grants agreement No 677465).

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