Synthesis of a potential decasaccharide vaccine-candidate against Cryptococcus neoformans infections

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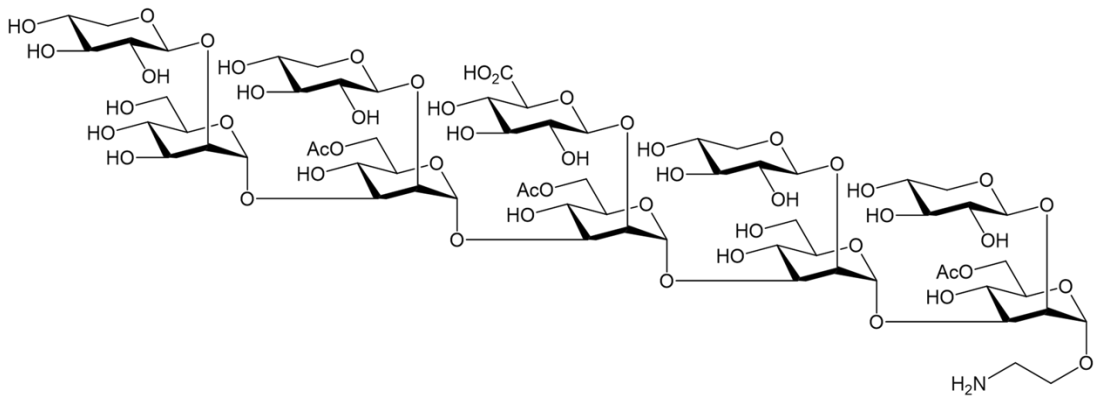
Cryptococcus neoformans causes around a million infections yearly resulting in death for more than half of the patients. [1,2] This environmental yeast is particularly deadly to immunosuppressed patients and current therapies are confronted by the emergence of resistance mechanisms. Therefore, new tools such as an efficient vaccine against the prevalent serotypes, that are type A and D, are needed. Synthetic carbohydrate-based vaccines have shown a rise of interest these past decades after the success of the *Haemophilus influenza type b* vaccine based on the use of capsular polysaccharide (CPS) conjugated to a protein carrier in 2003 (QuimiHib).[3]

Recently, Oscarson and co-workers screened 26 synthetic mono- to octodecasaccharides mimicking capsular glucuronoxylomannan (GXM) of all four serotypes of *C. neoformans* against anti-GXM monoclonal antibodies (mAbs).[4,5] It interestingly showed serotype A decasaccharide and bigger motives being of interest for vaccine development. However, it has been reported that some mAbs were protective while others were not. Same study suggested the acetylation pattern could be of importance regarding the efficiency of recognition by mAbs.

In that respect, we're developing a robust and efficient synthetic pathway towards the desired decasaccharide. The latter is aimed to be printed on microarrays for further mAbs recognition screening. Also, crystallisation and co-crystallisation with specific anti-GXM mAbs studies are underway. It may allow us to decipher the link between GXM structures and protective and unprotective properties of anti-GXM mAbs.



Targeted serotype A GXM decasaccharide motif bearing an amino linker allowing further conjugation

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