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Cover Profile

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Alex H. de Vries


Elmatine Douma-de Vries


Renze J. L. Sneep


Marthe T. C. Walvoort

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Invited for the cover of this issue is the group of Marthe Walvoort at the University of Groningen. The image depicts a cyclodextrin ring as a dartboard, which is hit with fucose darts at specific positions to give a di-fucosylated product. Read the full text of the article at 10.1002/chem.201806090.

What was the inspiration for this cover design?

With multiple positions available to attach a fucose residue, we decided to depict our cyclodextrin ring as a dartboard. We 'hit' it with fucose darts at specific positions (in this case, triple 20 and triple 17) to give a di-fucosylated product, and a high score. We meticulously built this cover picture from scratch using illustration software, and learned a lot about the darts game along the way, just as we did about cyclodextrin in this research project.

Did serendipity play a part in this work?

Yes, it did! Because there is so little known about direct glycosylation of the secondary rim, we initially set out to fully glycosylate all seven available hydroxyl groups in our cyclodextrin. However, even under forcing conditions this could not be accomplished. Instead, we observed the nonasaccharide with fucosides at the A and D positions as the main product. This is an intriguing example of regioselectivity that we are currently investigating further, both with glycosylation experiments and MD simulations.

What other topics are you working on at the moment?

In our group, we are intrigued by complex carbohydrates with beneficial properties, such as human milk oligosaccharides, non-digestible carbohydrates and probiotic exopolysaccharides. These sugars help shape an infant's microbiome and ward off infections, for instance. Because of their structural complexity, it is a challenge to isolate or synthesize pure samples for structure-function studies. We are developing novel chemical and enzymatic methods to easily generate certain sugar patterns, and collaborate with microbiologists and immunologists to explore the minimal structural requirements for these health effects.

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