

Publication

A Secondary Structural Element in a Wide Range of Fucosylated Glycoepitopes

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4156338**Author(s)** Aeschbacher, Thomas; Zierke, Mirko; Smieško, Martin; Collot, Mayeul; Mallet, Jean-Maurice; Ernst, Beat; Allain, Frédéric H.-T.; Schubert, Mario**Author(s) at UniBasel** [Ernst, Beat](#) ; [Zierke, Mirko](#) ; [Smiesko, Martin](#) ;**Year** 2017**Title** A Secondary Structural Element in a Wide Range of Fucosylated Glycoepitopes**Journal** Chemistry - A European Journal**Volume** 23**Number** 48**Pages / Article-Number** 11598-11610

The increasing understanding of the essential role of carbohydrates in development, and in a wide range of diseases fuels a rapidly growing interest in the basic principles governing carbohydrate-protein interactions. A still heavily debated issue regarding the recognition process is the degree of flexibility or rigidity of oligosaccharides. Combining NMR structure determination based on extensive experimental data with DFT and database searches, we have identified a set of trisaccharide motifs with a similar conformation that is characterized by a non-conventional C-H...O hydrogen bond. These motifs are present in numerous classes of oligosaccharides, found in everything from bacteria to mammals, including Lewis blood group antigens but also unusual motifs from amphibians and marine invertebrates. The set of trisaccharide motifs can be summarized with the consensus motifs X- β 1,4-[Fuc α 1,3]-Y and X- β 1,3-[Fuc α 1,4]-Y-a secondary structure we name [3,4]F-branch. The wide spectrum of possible modifications of this scaffold points toward a large variety of glycoepitopes, which nature generated using the same underlying architecture.

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