Structure-reactivity relationships in glycosylation chemistry

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List of Publications

Mapping the reactivity of 2,3-di-N-acetyl glucuronic acid and 2,4-di-*N*-acetyl bacillosamine building blocks in the synthesis of a highly *N*-acetylated Acinetobacter Baumannii LUH5554 tetrasaccharide
van Hengst JMA, Verhoeks V, de Bra D, Vlaming JCG, Schoenmakers J, Overkleeft HS, van der Marel GA, Codée JDC
Manuscript in preparation

Selective peroxygenase-catalysed oxidation of toluene derivates to benzaldehydes
Wang Y, Teetz N, Holtmann D, Alcalde M, van Hengst JMA, Liu X, Wang M, Qi W, Zhang W, Hollmann F.
ChemCatChem 2023, 15, e202300645

Peroxygenase-Catalysed Selective Oxidation of Silanes to Silanols
van Hengst JMA[#], Xu X[#], Mao Y, Martinez M, Roda S, Floor M, Guallar V, Paul CE, Alcalde M, Hollmann F.
Angew. Chem. Int. Ed. 2023, **62**, e202302844

Mapping the effect of configuration and protecting group pattern on glycosyl acceptor reactivity
van Hengst JMA, Hellemons RJC, Remmerswaal WA, van de Vrande KNA, Hansen T, van der Vorm S, Overkleeft HS, van der Marel GA, Codée JCD. *Chem. Sci.*, 2023,**14**, 1532-1542

Characterization of glycosyl dioxolenium ions and their role in glycosylation reactions.
Hansen T[#], Elferink H[#], van Hengst JMA, Houthuijs KJ, Remmerswaal WA, Kromm A, Berden G, van der Vorm S, Rijs AM, Overkleeft HS, Filippov DV, Rutjes FPJT, van der Marel GA, Martens J, Oomens J, Codée JDC, Boltje TJ; *Nat Commun* **11**, 2664 (2020).

Structure Kinetics Relationships and Molecular Dynamics Show Crucial Role for Heterocycle Leaving Group in Irreversible Diacylglycerol Lipase Inhibitors
Janssen APA, van Hengst JMA, Béquignon OJM, Deng H, van Westen GJP, van der Stelt M.
J. Med. Chem. 2019, **62**, 17, 7910–7922

Acceptor reactivity in glycosylation reactions
van der Vorm S , Hansen T , van Hengst JMA , Overkleeft HS , van der Marel GA , Codée JDC.
Chem. Soc. Rev., 2019,**48**, 4688-4706

Mapping the Relationship between Glycosyl Acceptor Reactivity and Glycosylation Stereoselectivity
van der Vorm S, van Hengst JMA, Bakker M, Overkleeft HS, van der Marel GA, Codée JDC.
Angew. Chem. Int. Ed. 2018, ***57***, 8240

Surface PEG Grafting Density Determines Magnetic Relaxation Properties of Gd-Loaded Porous Nanoparticles for MR Imaging Applications
Zhang W, Martinelli J, Peters JA, van Hengst JMA, Bouwmeester H, Kramer E, Bonnet CS, Szeremeta F, Tóth É, Djanashvili K.
ACS Appl. Mater. Interfaces 2017, **9**, 28, 23458–23465

# means equal contribution

Academic CV

Jacob van Hengst was born on 28 July 1993 in Rotterdam, the Netherlands. From 2005 to 2011 he attended the Johan de Witt Gymnasium in Dordrecht, where he obtained his secondary education degree (VWO) *cum laude* with a specialisation in science and technology (NG/NT). He competed in the National Chemistry Olympiad in 2010 and 2011, were he reached the top 20 and the 1st place respectively. In 2011 Jacob started with his bachelor Molecular Science and Technology at Leiden University and Delft University of Technology. As part of his bachelor, he worked on the PEGylation of Gd-loaded zeolite nanoparticles for MRI purposes under supervision of Wuyuan Zhang and Kristina Djanashvili at the TU Delft. In 2014 he obtained his BSc Degree *cum laude***.** In that same year, he started with his master's degree in chemistry at Leiden University with a specialisation in chemical biology. During his master's Jacob worked a year in the molecular physiology group under supervision of Anthe Janssen and Mario van der Stelt. He worked on the synthesis and *in vitro* evaluation of covalent inhibitors for serine hydrolase DAGLα. A large part of this internship was the optimisation of the synthesis of a key intermediate over 10 steps. His master's degree was obtained in 2017. In the same year Jacob started with his PhD in the group of Jeroen Codée and Gijs van der Marel at Leiden University. His work focussed on mechanistic research and method development within carbohydrate chemistry. Key findings are the way that substituents on the donor influence the S_N1 and S_N2 side of the reaction, how the nucleophilicity of the acceptor influences the glycosylation mechanism, how the reactivity of the acceptor is dependent on configuration and protecting group pattern and how this acquired knowledge can be applied in the total synthesis of complex oligosaccharide. Parts of his work are published in *Angewandte Chemie, Chemical Science* and *Nature communications* and presented at the CHAINS 2021 conference. Since September 2022 Jacob works as a postdoc in the group of Frank Hollmann at the TU Delft on enzymatic oxidations using environmentally benign oxidants like oxygen or hydrogen peroxide.

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