Curriculum Vitae
September 2017

Geert-Jan Boons

Professor and Chair

Utrecht University
Chemical Biology and Drug Discovery
Utrecht Institute for Pharmaceutical Sciences
Bijvoet Center for Biomolecular Research
David de Wied building, Office 5.72
Universiteitsweg 99, 3584 CG Utrecht (Netherlands)

Phone: (030) 253 73 96
E-mail: G.J.P.H.Boons@uu.nl
Websites: http://www.uu.nl/medewerkers/GJPHBoons and
https://www.uu.nl/en/research/chemical-biology-and-drug-discovery

Date of Birth April 7, 1962 (Oisterwijk, The Netherlands)

Education

1987	First Degree (equivalent to M.Sc.), Chemistry, State University of Leiden (Netherlands)
1991	Ph.D., Synthetic Carbohydrate Chemistry, State University of Leiden (Netherlands), advisor Prof. J.H. van Boom Thesis title: An approach towards the development of a synthetic vaccine against *Neisseria meningitidis*
1991-1992	Postdoctoral Research Assistant, with Prof. S.V. Ley, Imperial College, London (United Kingdom)
1992-1993	Postdoctoral Research Assistant, with Prof. S.V. Ley University of Cambridge (United Kingdom)

Professional Experience

1987-1988	Research Scientist, Department of Research and Development, N.V. Organon, Oss (Netherlands)
1993-1997	Lecturer, Bioorganic Chemistry, University of Birmingham (United Kingdom)
1997-1998	Professor, Bioorganic Chemistry, University of Birmingham (United Kingdom)
1998-present	Professor, Complex Carbohydrate Research Center and Department of Chemistry, University of Georgia, Athens (USA)
2004-2013	Appointed *Franklin Professor of Chemistry*, Franklin College of Arts and Sciences, University of Georgia
2006	Visiting Professor, Université de Picardie Jules Verne, Amiens (France)
2013-present	Appointed *UGA Foundation Distinguished Professor in Biochemical Sciences*, Franklin College of Arts and Sciences, University of Georgia
2015-present	Professor and Chair, Chemical Biology and Drug Discovery, Departments of Pharmaceutical Sciences and Chemistry, Faculty of Sciences, Utrecht University (Netherlands)

Honors and Awards

1991-1993	Ramsay Memorial Fellowship

2001	Elected co-chair, 2003 Gordon Research Conference on Carbohydrate
2003	Carbohydrate Research Award for Creativity in Carbohydrate Science, European Carbohydrate Organisation at EuroCarb 2003
2003	Elected chair, 2005 Gordon Research Conference on Carbohydrate
2004	Northeast Georgia American Chemical Society (NEGACS) Chemist of the Year Award for Research
2004	Horace S. Isbell Award, Division of Carbohydrate Chemistry, American Chemical Society
2004	Appointed *Franklin Professor of Chemistry*, Franklin College of Arts and Sciences, University of Georgia
2012	Creative Research Inventor's Award, University of Georgia Research Foundation
2013	Appointed *UGA Foundation Distinguished Professor in Biochemical Sciences*, Franklin College of Arts and Sciences, University of Georgia
2014	Roy L. Whistler International Award in Carbohydrate Chemistry, International Carbohydrate Organization (ICO)
2015	Lamar Dodd Creative Research Award, University of Georgia Research Foundation
2015	Claude S. Hudson Award, Division of Carbohydrate Chemistry, American Chemical Society
2016	Arthur C. Cope Mid Career Scholars Award, Arthur C. Cope Fund, American Chemical Society

Professional Service

1994-1998	Member of the Safety Committee of the School of Chemistry, University of Birmingham (United Kingdom)
1995-1998	Member of the Biotechnology Executive Group of the University of Birmingham (United Kingdom)
1997-1999	Member of the Engineering and Physical Sciences Research Council (EPSRC), College for Synthetic and Biological Research (United Kingdom)
1999-2009	Editorial Board Member, *Carbohydrate Research*
2001-present	Editorial Board Member, *Journal of Carbohydrate Chemistry*
2001	Search Committee for Pharmacy Department Head, University of Georgia
2001-2005	Ad Hoc NIH Study Sections: Med Chem A, Bioorganic and Natural Products Chemistry, Innate Immunity and Inflammation, Immunity and Host Defense, Drug Development & Delivery, Synthetic and Biological Chemistry-A
2003-present	Executive Committee Member, Carbohydrate Division of American Chemical Society
2004-present	Member of the Center for Drug Discovery, College of Pharmacy, University of Georgia
2004	Chair of Search Committee for Assistant Professor of Chemistry, Chemistry Department, University of Georgia
2004	Chair of Search Committee for Assistant Professor, Complex Carbohydrate Research Center, University of Georgia
2004-present	Editorial Board Member, *Advances in Carbohydrate Chemistry and Biochemistry*
2005-2008	Permanent Member, Synthetic and Biological Chemistry A NIH Study Section
2007-present	Member of the University of Georgia Cancer Center
2007-2012	Steering Committee Member, Consortium for Functional Glycomics (CFG)
2008-present	Member of the Nanoscale Science and Engineering Center (NanoSEC), University of Georgia
2008-present	Editorial Board Member, *Glycoconjugate Journal*
2008-present	Executive Committee Member, Complex Carbohydrate Research Center, University of Georgia
2008-2010	Member of the Lamar Dodd Creative Research Award Selection Committee, University of Georgia

2010-2011 Member of National Academies of Science (NAS) Task Group on Assessing the Importance of Glycomics and Glycosciences
2011-2014 International Advisory Board Member, *European Journal of Organic Chemistry*
2011-present Scientific Advisory Board Member, Alberta Ingenuity Centre for Carbohydrate Science (AICCS)
2011-2012 Member of National Academies of Science (NAS) Committee on Assessing the Importance and Impact of Glycomics and Glycosciences (Report: *Transforming Glycoscience: A Roadmap for the Future*; http://www.nap.edu/catalog.php?record_id=13446)
2011-present Founder of ViaMune, Inc
2012-2014 Scientific Advisor, SCYNEXIS, Inc
2012-present Leader of the Subgroup 'Glycan Synthesis and Microarrays' of the Consortium for Functional Glycomics (CFG) and CFG Steering Committee member
2012-present Associate Director of External Affair, Complex Carbohydrate Research Center, University of Georgia
2013-present Scientific Advisory Board Member, Institute for Chemical Immunology (ICI) (Netherlands)
2013-2015 Editorial Board Member, *Carbohydrate Research*
2014 & 2016 Member of the PE5–Synthetic Chemistry and Materials Starting Grant Evaluation Panel of the European Research Council (ERC)
2014-2018 Treasurer of the American Chemical Society (ACS) Carbohydrate (CARB) Division
2015-present Advisory Board Member, Amphastar Pharmaceuticals, Inc
2015-present Scientific Advisory Board Member, Kaleido Biosciences
2015-present Program Leader, Utrecht Institute of Pharmaceutical Sciences, Utrecht University
2015-present Executive Board Member, Bijvoet Center for Biomolecular Research, Utrecht University
2017-present Scientific Advisory Board Member, Multidisciplinary European Joint Doctorate in the Design and Development of Glyco Drugs (PhD4GlycoDrug consortium)

Conferences/Symposia Organized

RSC Symposium, New Directions in Organic and Bioorganic Chemistry, School of Chemistry, University of Birmingham (United Kingdom) December 10, 1996: Chair

RSC Spring Meeting of the Carbohydrate Group: Synthesis, Structure and Function, School of Chemistry, University of Birmingham (United Kingdom) March 29-April 1, 1998: Chair

Gordon Research Conference on Carbohydrates, Tilton School, NH (USA) June 19-24, 2005: Chair

Symposium 'Carbohydrate Recognition Mechanisms and Applications' at the 231st National Meeting of the American Chemical Society, Chemistry Division of Carbohydrates, Atlanta, GA (USA) March 26-27, 2006: Co-organizer

Georgia Glycoscience Symposia, Complex Carbohydrate Research Center, University of Georgia, Athens, GA (USA) May 12, 2005; May 18, 2006; May 8, 2007; May 16, 2008; April 28, 2015: Co-organizer

Symposium 'Synthetic Oligosaccharides and Glycoconjugates for Preventing and Combating Disease' at the 240th National Meeting & Exposition of the American Chemical Society, Boston, MA (USA) August 23, 2010: Co-organizer

Symposium 'Carbohydrate Recognition in Health and Disease' at the 2010 Pacifichem Conference, Honolulu, HI (USA) December 15-20, 2010: Co-organizer

Georgia Glycoscience Symposium and CFG Workshop, Paradigms for Glycan Action in Development and Disease, Complex Carbohydrate Research Center, University of Georgia, Athens, GA (USA) March 14-15, 2011: Co-organizer

Symposium 'Glycoscience at the Crossroad of Health, Materials, and Energy' at the 244th ACS National Meeting, Philadelphia, PA (USA) August 21-22, 2012: Co-organizer

2013 International Symposium on Chemical Glycobiology, Consortium for Functional Glycomics (CFG) and the Chinese Academy of Sciences (CAS), Shanghai (China) June 29-July 1, 2013: Co-organizer

The 27th International Carbohydrate Symposium, Indian Institute of Science, Bangalore (India) January 12-17, 2014: Scientific Programme Committee member

CFG Workshop in Molecular and Cellular Glycoscience, 'Exploring the Frontiers of Chemical Glycoscience', Bethesda, MD (USA) May 19-20, 2014: Co-organizer

Symposium 'Carbohydrate Recognition in Health and Disease' at Pacifichem 2015, Honolulu, HI (USA) December 15-20, 2015: Co-organizer

Symposium 'Synthesis of Carbohydrates, Glycoconjugates & Glycan-Based Biomaterials' at the XXVIII International Carbohydrate Symposium (ICS 2016), New Orleans, LA (USA) July 18-19, 2016: Co-organizer

Eurocarb Biennial Symposium 20, Leiden (Netherlands) 2019: Local Organising Committee member

Professional Societies

1986-present Royal Dutch Society of Chemistry (KNCV)
2000-present American Chemical Society (ACS)
2001-present American Association for the Advancement of Science (AAAS)
2002-present Society for Glycobiology
2006-2016 American Society for Microbiology (ASM)

Publications (in reverse chronological order)

263 Capicciotti, C.J., C. Zong, M.O. Sheikh, T. Sun, L. Wells, and G.J. Boons. 2017. Cell-surface glyco-engineering by exogenous enzymatic transfer using a bifunctional CMP-Neu5Ac derivative. *J. Am. Chem. Soc.* In press (DOI: 10.1021/jacs.7b05358).

262 Aizpurua-Olaizola O., J. Sastre Toraño, A.V. Pukin, O. Fu, G.J. Boons, G.J. de Jong, and R.J. Pieters. 2017. Affinity capillary electrophoresis for the assessment of binding affinity of carbohydrate-based cholera toxin inhibitors. *Electrophoresis* In press (DOI: 10.1002/elps.201700207).

261 Agyekum, I., C. Zong, G.J. Boons, J, and I.J. Amster. 2017. Single stage tandem mass spectrometry assignment of the C-5 uronic acid stereochemistry in heparan sulfate tetrasaccharides using electron detachment dissociation. *J. Am. Soc. Mass Spectrom.* **28**(9): 1741-1750.

260 Ding, N., X. Li, Z.S. Chinoy, and G.J. Boons. 2017. Synthesis of a glycosylphosphatidylinositol anchor derived from *Leishmania donovani* that can be functionalization by Cu-catalyzed azide-alkyne cycloadditions. *Org. Lett.* **19**(14): 3827-3830.

259 Zong, C., A. Venot, X. Li, W. Lu, W. Xiao, J.L. Wilkes, C.L. Salanga, T.M. Handel, L. Wang, M.A. Wolfert, and G.J. Boons. 2017. Heparan sulfate microarray reveals that heparan sulfate-protein binding exhibits different ligand requirements. *J. Am. Chem. Soc.* **139**(28): 9534-9543.

258 Lin, A.E., C.A. Autran, A. Szyszka, T. Escajadillo, M. Huang, K. Godula, A.R. Prudden, G.J. Boons, A.L. Lewis, K.S. Doran, V. Nizet, and L. Bode. 2017. Human milk oligosaccharides inhibit growth of group B *Streptococcus. J. Biol. Chem.* **292**(27): 11243-11249.

257 Prudden, A.R., L. Liu, C.J. Capicciotti, M.A. Wolfert, S. Wang, Z. Gao, L. Meng, K.W. Moremen, and G.J. Boons. 2017. Synthesis of asymmetrical multiantennary human milk oligosaccharides. *Proc. Natl. Acad. Sci. U. S. A.* **114**(27): 6954-6959.

256 Movahedin, M., T.M. Brooks, N.T. Supekar, N. Gokanapudi, G.J. Boons, and C.L. Brooks. 2017. Glycosylation of MUC1 influences the binding of a therapeutic antibody by altering the conformational equilibrium of the antigen. *Glycobiology* **27**(7): 677-687.

255 Dhamale, O., R.E. Lawrence, E.M. Wiegmann, B.A. Shah, K. al-Mafraji, W.C. Lamanna, T.

Lübke, T. Dierks, G.J. Boons, and J.D. Esko. 2017. Arylsulfatase K is the lysosomal 2-sulfogluronate sulfatase. *ACS Chem. Biol.* **12**(2): 367-373.

254 Halmo, S.M., D. Singh, S. Patel, S. Wang, M. Edlin, G.J. Boons, K.W. Moremen, D. Live, and L. Wells. 2017. Protein O-linked mannose β-1,4-N-acetylglucosaminyltransferase 2 (POMGNT2) is a gatekeeper enzyme for functional glycosylation of α-dystroglycan. *J. Biol. Chem.* **292**(6): 2101-2109.

253 Gagarinov, I.A., T. Li, J. Sastre Toraño, T. Caval, A.D. Srivastava, J.A.W. Kruijtzer, A.J.R. Heck, and G.J. Boons. 2017. Chemoenzymatic approach for the preparation of asymmetric bi-, tri- and tetra-antennary *N*-glycans from a common precursor. *J. Am. Chem. Soc.* **139**(2): 1011–1018.

252 Zhao, Y., A. Singh, Y. Xu, C. Zong, F. Zhang, G.J. Boons, J. Liu, R.J. Linhardt, R.J. Woods, and I.J. Amster. 2017. Gas-phase analysis of the complex of fibroblast growth factor 1 with heparan sulfate: a traveling wave ion mobility spectrometry (TWIMS) and molecular modeling study. *J. Am. Soc. Mass Spectrom.* **28**(1): 96-109.

251 Li, T., M. Huang, L. Liu, S. Wang, K.W. Moremen, and G.J. Boons. 2016. Divergent chemoenzymatic synthesis of asymmetrical core fucosylated and core-unmodified *N*-glycans. *Chem. Eur. J.* **22**(52): 18742-18746.

250 Gao, Q., C.-Y. Chen, C. Zong, S. Wang, A. Ramiah, P. Prabhakar, L. Morris, G.J. Boons, K. Moremen, and J. Prestegard. 2016. Structural aspects of heparan sulfate binding to Robo1-Ig1-2. *ACS Chem. Biol*. **11**(11): 3106-3113.

249 Singh, A., M.B. Tessier, K. Pederson, X. Wang, A.P. Venot, G.J. Boons, J.H. Prestegard, and R.J Woods. 2016. Extension and validation of the GLYCAM force field parameters for modeling glycosaminoglycans. *Can. J. Chem.* **94**(11): 927-935.

248 Zong, C., R. Huang, E. Condac, Y. Chiu, W. Xiao, X. Li, W. Lu, M. Ishahara, S. Wang, A. Ramiah, M. Stickney, P. Azadi, I.J. Amster, K.W. Moremen, L. Wang, J.S. Sharp, and G.J. Boons. 2016. Integrated approach to identify heparan sulfate ligand requirements of Robo1. *J. Am. Chem. Soc.* **138**(39): 13059**–**13067.

247 Bode, L., N. Contractor, D. Barile, N. Pohl, A. Prudden, G.J. Boons, Y.-S. Jin, and S. Jennewein. 2016. Overcoming the limited availability of human milk oligosaccharides: challenges and opportunities for research and application. *Nutr. Rev.* **74**(10): 635-644.

246 Sun, T., S.-H. Yu, P. Zhao, L. Meng, K.W. Moremen, L. Wells, R. Steet, and G.J. Boons. 2016. One-step selective exoenzymatic labeling (SEEL) strategy for the biotinylation and identification of glycoproteins of living cells. *J. Am. Chem. Soc.* **138**(36): 11575-11582.

245 Li, X., S.J.H. Martin, Z.S. Chinoy, L. Liu, B. Rittgers, R.A. Dluhy, and G.J. Boons. 2016. Label-free detection of glycan-protein interactions for array development by surface enhanced Raman spectroscopy (SERS). *Chem. Eur. J.* **22**(32): 11180-11185.

244 Bakkers, M.J.G., Q. Zeng, L.J. Feitsma, R.J.G. Hulswit, Z. Li, A. Westerbeke, F.J.M. van Kuppeveld, G.J. Boons, M.A. Langereis, E.G. Huizinga, and R.J. de Groot. 2016. Coronavirus receptor switch explained from the stereochemistry of protein-carbohydrate interactions and a single mutation. *Proc. Natl. Acad. Sci. U. S. A.* **113**(22): E3111-E3119.

243 Huang, R., C. Zong, A. Venot, Y. Chiu, D. Zhou, G.J. Boons, and J.S. Sharp. 2016. De novo sequencing of complex mixtures of heparan sulfate oligosaccharides. *Anal. Chem.* **88**(10): 5299-5307.

242 Wang, K., F. Friscourt, C. Dai, L. Wang, Y. Zheng, G.J. Boons, S. Wang, and B. Wang. 2016. A metal-free turn-on fluorescent probe for the fast and sensitive detection of inorganic azides. *Bioorg. Medicinal Chem. Lett.* **26**(7): 1651-1654.

Coverage in Synform*: Synform* 2016/09: A131–A134.

241 Fang, T., Y. Gu, W. Huang, and G.J. Boons. 2016. Mechanism of glycosylation of anomeric sulfonium ions. *J. Am. Chem. Soc*. **138**(9): 3002-3011.

240 Ríos, P., T.S. Carter, T.J. Mooibroek, M.P. Crump, M. Lisbjerg, M. Pittelkow, N.T. Supekar, G.J.

Boons, and A.P. Davis. 2016. Synthetic receptors for high-affinity recognition of *O*-GlcNAc derivatives. *Angew. Chem. Int. Ed.* **55**(10): 3387-3392.

239 Martínez-Sáez, N., N.T. Supekar, M.A. Wolfert, I.A. Bermejo, R. Hurtado-Guerrero, J.L. Asensio, J. Jiménez-Barbero, J.H. Busto, A. Avenoza, G.J. Boons, J.M. Peregrina, and F. Corzana. 2016. Mucin architecture behind the immune response: design and evaluation and conformational analysis of an antitumor vaccine derived from an unnatural MUC1 fragment. *Chem. Sc*. **7**(3): 2294-2301.

238 Yu, S.-H., P. Zhao, T. Sun, Z. Gao, K.W. Moremen, G.J. Boons, L. Wells, R. Steet. 2016. Selective exo-enzymatic labeling detects increased cell surface sialoglycoprotein expression upon megakaryocytic differentiation. *J. Biol. Chem.* **291**(8): 3982-3989.

237 Hudlikar, M.S., X. Li, I.A. Gagarinov, N. Kolishetti, M.A. Wolfert, and G.J. Boons. 2016. Controlled multi-functionalization facilitates targeted delivery of nanoparticles to cancer cells. *Chem. Eur. J.* **22**(4): 1415-1423.

236 Lakshminarayanan V., N.T. Supekar, J. Wei, D.B. McCurry, A.C. Dueck, H.E. Kosiorek, P.P. Trivedi, J.M. Bradley, C.S. Madsen, L.B. Pathangey, D. Hoelzinger, M.A. Wolfert, G.J. Boons, P.A. Cohen, and S.J. Gendler. 2016. MUC1 vaccines, comprised of glycosylated or non-glycosylated peptides or tumor-derived MUC1, can circumvent immunoediting to control tumor growth in MUC1 transgenic mice. *PLoS ONE* **11**(1): e0145920.

235 van der Beek, S.L., Y. Le Breton, A.T. Ferenbach, R.N. Chapman, D.M.F. van Aalten, I. Navratilova, G.J. Boons, K.S. McIver, N.M. van Sorge, and H.C. Dorfmueller. 2015. GacA is essential for Group A *Streptococcus* and defines a new class of monomeric dTDP-4-dehydrorhamnose reductases (RmlD). *Mol. Microbiol*. **98**(5): 946-962.

234 Agyekum, I., A.B. Patel, C.L. Zong, G.J. Boons, and I.J. Amster. 2015. Assignment of hexuronic acid stereochemistry in synthetic heparan sulfate tetrasaccharides with 2-*O*-sulfo uronic acids using electron detachment dissociation. *Int. J. Mass Spectrom.* **390:** 163-169.

233 Friscourt, F., C.J. Fahrni, and G.J. Boons. 2015. Fluorogenic strain-promoted alkyne-diazo cycloadditions. *Chem. Eur. J.* **21**(40): 13996-14001.

232 Huang, W., Q. Gao, and G.J. Boons. 2015. Assembly of a complex branched oligosaccharide by combining fluorous-supported synthesis and stereoselective glycosylations using anomeric sulfonium ions. *Chem. Eur. J.* **21**(37): 12920-12926. ***Selected for frontispiece.***

231 Liu, L., J. Zha, A. DiGiandomenico, D. McAllister, C.K. Stover, Q. Wang, and G.J. Boons. 2015. Synthetic enterobacterial common antigen (ECA) for the development of a universal immunotherapy for drug-resistant *Enterobacteriaceae*. *Angew. Chem. Int. Ed.* **54**(37): 10953-10957.

Press release by Angew. Chem. Int. Ed. News Room (Juli 31, 2015): Sugar Antigen Lost its Resistance. Successful chemical synthesis of enterobacterial common antigen relevant for immunotherapy. ***Highlighted in C&EN:*** Borman, S. A. 2015. Enterobacterial antigen analogs synthesized. Carbohydrate chemistry: Protein conjugates of the antigen could serve as vaccines for pathogenic bacteria. *Chemical & Engineering News*, **93**(32): 50.

230 Chinoy, Z.S., C.M. Schafer, C.M. West, and G.J. Boons. 2015. Chemical synthesis of a glycopeptide derived from Skp1 for probing protein specific glycosylation. *Chem. Eur. J.* **21**(33): 11779–11787.

229 Ledin, P.A., W. Xu, F. Friscourt, G.J. Boons, and V. Tsukruk. 2015. Branched polyhedral oligomeric silsesquioxane nanoparticles prepared via strain-promoted 1,3-dipolar cycloadditions. *Langmuir* **31**(29): 8146–8155.

228 Thompson, P., V. Lakshminarayanan N.T. Supekar, J.M. Bradley, P.A. Cohen, M.A. Wolfert, S.J. Gendler, and G.J. Boons. 2015. Linear synthesis and immunological properties of a fully synthetic vaccine containing a sialylated MUC1 glycopeptide. *Chem. Commun.* **51**(50): 10214-10217.

227 Gagarinov, I.A., T. Fang, L. Liu, A,D. Srivastava, and G.J. Boons. 2015. Synthesis of

Staphylococcus aureus Type 5 trisaccharide repeating unit: solving the problem of lactamization. *Org. Lett.* **17**(4): 928-931.

226 Forestier, C.L. Q. Gao, and G.J. Boons. 2015. *Leishmania* lipophosphoglycan: how to establish structure-activity relationships for this highly complex and multifunctional glycoconjugate? *Front. Cell. Infect. Microbiol*. **4** (Article 193): 1-7.

225 Huang, Y., Y. Mao, C. Zhong, C. Lin, G.J. Boons, and J. Zaia. 2015. Discovery of a heparan sulfate 3-O-sulfation specific peeling reaction. *Anal. Chem*. **87**(1): 592-600.

224 Praissman, J.L., D.H. Live, S. Wang, A. Ramiah, Z.S. Chinoy, G.J. Boons, K.W. Moremen, and L. Wells. 2014. B4GAT1 is the priming enzyme for the LARGE-dependent functional glycosylation of α-dystroglycan*. eLife* **3**: e03943.

223 Hu, H., Y. Huang, Y. Mao, X. Yu, Y. Xu, J. Liu, C. Zong, G.J. Boons, C. Lin, Y. Xia, and J. Zaia. 2014. A computational framework for heparan sulfate sequencing using high-resolution tandem mass spectra. *Mol. Cell. Proteomics* **13**(9): 2490-2502.

222 Prudden, A.R., Z.S. Chinoy, M.A. Wolfert, and G.J. Boons. 2014. A multifunctional anomeric linker for the chemoenzymatic synthesis of complex oligosaccharides. *Chem. Commun.* **50**(54): 7132-7135.

221 Li, X., T. Fang, and G.J. Boons. 2014. Preparation of well-defined antibody–drug conjugates through glycan remodeling and strain-promoted azide–alkyne cycloadditions. *Angew. Chem. Int. Ed*. **53**(28): 7179-7182.

220 Abdel Aal, A.M., V. Lakshminarayanan, P. Thompson, N. Supekar, J.M. Bradley, M.A. Wolfert, P.A. Cohen, S.J. Gendler, and G.J. Boons. 2014. Immune and anticancer responses elicited by fully synthetic aberrantly glycosylated MUC1 tripartite vaccines modified by a TLR2 or TLR9 agonist. *ChemBioChem* **15**(10): 1508-1513.

219 Ledin, P.A., N. Kolishetti, M.S. Hudlikar, and G.J. Boons. 2014. Exploring strain-promoted 1,3-dipolar cycloadditions on end functionalized polymers. *Chem.-Eur. J.* **20**(28): 8753-8760.

218 Arumugam, S., J. Guo, N.E. Mbua, F. Friscourt, N. Lin, E. Nekongo, G.J. Boons, and V.V. Popik. 2014. Selective and reversible photochemical derivatization of cysteine residues in peptides and proteins. *Chem. Sci*. **5**(4): 1591-1598.

217 Dhamale, O.P., C. Zhong, K. Al-Mafraji, and G.J. Boons. 2014. New glucuronic acid donors for the modular synthesis of heparan sulfate oligosaccharides. *Org. Biomol. Chem.* (12): 2087-2098.

216 Kailemia M.J., M. Park, D.A. Kaplan, A. Venot, G.J. Boons, L. Li, R.J Linhardt, and I.J. Amster. 2014. High-field asymmetric-waveform ion mobility spectrometry and electron detachment dissociation for isobaric mixtures of glycosaminoglycans. *J. Am. Soc. Mass Spectrom.* **25**(2): 258-268.

215 Li, H., K. Mo, Q. Wang, C.K. Stover, A. DiGiandomenico, and G.J. Boons. 2013. Epitope mapping of monoclonal antibodies using synthetic oligosaccharides uncovers novel aspects of immune recognition of the Psl exopolysaccharide of *Pseudomonas aeruginosa. Chem.-Eur. J*. **19**(51): 17425-17431.

214 Live, D., L. Wells, and G.J. Boons. 2013. Dissecting the molecular basis for the role of the *O*-mannosylation pathway in disease: α-dystroglycan and forms of muscular dystrophy. *ChemBioChem* **14**(18): 2392-2402.

213 Mbua, N.E., X. Li, H. Flanagan-Steet, L. Meng, K. Aoki, K.W. Moremen, M.A. Wolfert, R. Steet, and G.J. Boons. 2013. Selective exo-enzymatic labeling of *N*-glycans of living cells by recombinant ST6Gal I. *Angew. Chem. Int. Ed*. **52**(49): 13012-13015. ***Selected as "Hot Paper".***

212 Wolfert, M.A. and G.J. Boons. 2013. Adaptive immune activation: glycosylation does matter. *Nat. Chem. Biol.* **9**(12): 776-784.

211 Ledin, P.A., N. Kolishetti, and G.J. Boons. 2013. Multifunctionalization of polymers by strain-promoted cycloadditions. *Macromolecules* **46**(19): 7759-7768.

210 Heimburg-Molinaro J., J.W. Priest, D. Live, G.J. Boons, X. Song, R.D. Cummings, and J.R. Mead. 2013. Microarray analysis of the human antibody response to synthetic *Cryptosporidium* glycopeptides. *Int. J. Parasitol*. **43**(11): 901-907.

209 Kaeothip, S. and G.J. Boons. 2013. Chemical synthesis of β-arabinofuranosyl containing oligosaccharides derived from plant cell wall extensins. *Org. Biomol. Chem.* **11**(31): 5136-5146.

208 Wang, Z., Z. Chinoy, S. Ambre, W. Peng, R. McBride, R.P. de Vries, J. Glushka, J.C. Paulson, and G.J. Boons. 2013. A general strategy for the chemoenzymatic synthesis of asymmetrically branched *N*-glycans. *Science* **341**(6144): 379-383.

Highlighted in Science; C&EN; Nature News; Nature Methods*:* Kiessling, L. L. and M.B. Kraft. 2013. A path to complex carbohydrates. *Science* **341**(6144): 357-358; Arnaud, C.H. 2013. Branching out in different ways. Carbohydrate chemistry: New synthetic strategy leads to asymmetrically branched *N*-glycans. *Chem. Eng. News* **91**(30): 9; Johnston, R. 2013. Asymmetrical glycans synthesized in lab. *Nature*, doi:10.1038/nature. 2013.13454; Eisenstein, M. 2013. Constructing complicated carbohydrates. *Nat. Methods* **10**(10): 932.

207 Arumugam, S., S.V. Orski, N.E. Mbua, C. McNitt, G.J. Boons, J. Locklin, and V.V. Popik. 2013. Photo-click chemistry strategies for spatiotemporal control of metal-free ligation, labeling, and surface derivatization. *Pure Appl. Chem.* **85**(7): 1499-1513.

206 Mbua, N.E., H. Flanagan-Steet, S. Johnson, M.A. Wolfert, G.J. Boons, and R. Steet. 2013. Abnormal accumulation of sialylated glycoproteins visualized in Niemann-Pick Type C cells using the chemical reporter strategy. *Proc. Natl. Acad. Sci. U. S. A*. **110**(25): 10207-10212.

205 Zong, C., A. Venot, O. Dhamale, and G.J. Boons. 2013. Fluorous supported modular synthesis of heparin sulfate oligosaccharides. *Org. Lett.* **15(**2): 342-345.

204 Talabnin, K., K. Aoki, P. Saichua, S. Wongkham, S. Kaewkes, G.J. Boons, B. Sripa, and M. Tiemeyer. 2013. Stage-specific expression and antigenicity of glycoprotein glycans isolated from the human liver fluke, *Opisthorchis viverrini*. *Int. J. Parasitol.* **43**(1): 37-50.

203 Leach III, F.E., S. Arungundram, K. Al-Mafraji, A. Venot, G.J. Boons, and I.J. Amster. 2012. Electron detachment dissociation of synthetic heparan sulfate glycosaminoglycan tetrasaccharides varying in degree of sulfation and hexuronic acid stereochemistry. *Int. J. Mass Spectrom.* **330-332***:* 152-159.

202 Friscourt, F., C.J. Fahrni, and G.J. Boons. 2012. A fluorogenic probe for the catalyst-free detection of azide-tagged molecules. *J. Am. Chem. Soc.* **134**(45): 18809-18815.

201 Mo, K.F., X. Li, H. Li, L.Y. Low, C.P. Quinn, and G.J. Boons. 2012. Endolysins of *Bacillus anthracis* bacteriophages recognize unique carbohydrate epitopes of vegetative cell wall polysaccharides with high affinity and selectivity. *J. Am. Chem. Soc*. **134**(37): 15556–15562.

200 Boltje, T.J., W. Zhong, J. Park, M.A. Wolfert, W. Chen, and G.J. Boons. 2012. Chemical synthesis and immunological evaluation of the inner-core oligosaccharide of *Francisella tularensis. J. Am. Chem. Soc*. **134**(34): 14255-14262.

199 Fang, T., K.F. Mo, and G.J. Boons. 2012. Stereoselective assembly of complex oligosaccharides using anomeric sulfonium ions as glycosyl donors. *J. Am. Chem. Soc.* **134**(17): 7545-7552.

198 Guo, J., G. Chen, X. Ning, X. Li, J. Zhou, A. Jagielska, B. Xu, and G.J. Boons. 2012. A chemo-mechanical tweezer for single molecular characterization of soft materials. *Chem.-Eur. J.* **18**(15): 4568-4574.

197 Friscourt, F., P.A. Ledin, N.E. Mbua, H.R Flanagan-Steet, M.A. Wolfert, R. Steet, and G.J. Boons. 2012. Polar dibenzocyclooctynes for selective labeling of extracellular glycoconjugates of living cells. *J. Am. Chem. Soc.* **134**(11): 5381-5389.

196 Lawrence, R., J.R. Brown, K. Al-Mafraji, W.C. Lamanna, J.R. Beitel, G.J. Boons, J.D. Esko, and B.E. Crawford. 2012**.** Disease-specific non-reducing end carbohydrate biomarkers for mucopolysaccharidoses. *Nat. Chem. Biol*. **8**(2): 197-204.

195 Nguyen T.K., S. Arungundram, V.M. Tran, K. Raman, K. Al-Mafraji, A. Venot , G.J. Boons, and

B. Kuberan. 2012. A synthetic heparan sulfate oligosaccharide library reveals the novel enzymatic action of D-glucosaminyl 3-*O*-sulfotransferase-3a. *Mol. BioSyst.* **8**: 609-614.

194 van der Linden, W.A., N. Li, S. Hoogendoorn, M. Ruben, M. Verdoes, J. Guo, G.J. Boons, G.A. van der Marel, B.I. Florea, H.S. Overkleeft. 2012. Two-step bioorthogonal activity-based proteasome profiling using copper-free click reagents: a comparative study. 2011. *Bioorg. Med. Chem.* **20**(2): 662-666.

193 Lakshminarayanan, V., P. Thompson, M.A. Wolfert, T. Buskas, J.M. Bradley, L.B. Pathangey, C.S. Madsen, P.A. Cohen, S.J. Gendler, and G.J. Boons. 2012. Immune recognition of tumor-associated mucin MUC1 is achieved by a fully synthetic aberrantly glycosylated MUC1 tripartite vaccine. *Proc. Natl. Acad. Sci. U. S. A*. **109**(1): 261-266.

192 Akimoto, Y., Y. Miura, T. Toda, M.A. Wolfert, L. Wells, G.J. Boons, G.W. Hart, T. Endo, and H. Kawakami. 2011. Morphological changes in diabetic kidney are associated with increased *O*-GlcNAcylation of cytoskeletal proteins including α-actinin 4. *Clin. Proteomics* **8**: 15.

191 Mo, K., T. Fang, S. Stalnaker, P.S. Kirby, M. Liu, L. Wells, M. Pierce, D.H. Live and G.J. Boons. 2011. Synthetic, structural and biosynthetic studies of an unusual phospho-glycopeptide derived from α-dystroglycan. *J. Am. Chem. Soc.* **133**(36): 14418-14430.

190 Zhao, P., R. Viner, C.F. Teo, G.J. Boons, D. Horn, and L. Wells. 2011. Combining high-energy C-trap dissociation and electron transfer dissociation for protein O-GlcNAc modification site assignment. *J. Proteome Res.* **10**(9): 4088-4104.

189 Mbua, N.E., J. Guo, M.A. Wolfert, R. Steet, and G.J. Boons. 2011. Strain-promoted alkyne-azide cycloadditions (SPAAC) reveal new features of glycoconjugate biosynthesis. *ChemBioChem* **12**(12): 1912-1921.

188 Mir, M., J. Asong, X. Li, J. Cardot, G.J. Boons, and R.N. Husson. 2011. The extracytoplasmic domain of the *Mycobacterium tuberculosis* Ser/Thr kinase PknB binds specific muropeptides and is required for PknB localization. *PLoS Pathog.* **7**(7): e1002182.

187 Li, X., J. Guo, J. Asong, M.A. Wolfert, and G.J. Boons. 2011. Multifunctional surface modification of gold-stabilized nanoparticles by bioorthogonal reactions. *J. Am. Chem. Soc.* **133**(29): 11147-11153.

Highlighted in ChemViews Magazine*:* News. 2011. Modular modification of gold nanoparticles. *ChemViews Magazine of ChemPubSoc Europe,* news 1236817.

186 Kashyap, D.R., M. Wang, L.H. Liu, G.J. Boons, D. Gupta, and R. Dziarski. 2011. Peptidoglycan recognition proteins kill bacteria by inducing suicide through protein-sensing two-component systems. *Nat. Med.* **17**(6): 676-683.

185 Leach III, F.E., J.J. Wolff, Z. Xiao, M. Ly, T.N. Laremore, S. Arungundram, K. Al-Mafraji, A. Venot, G.J. Boons, R.J. Linhardt, I.J. Amster. 2011. Negative electron transfer dissociation Fourier transform mass spectrometry of glycosaminoglycan carbohydrates. *Eur. J. Mass Spectrom*. **17**(2): 167-176.

184 Saile, E., G.J. Boons, T. Buskas, R.W. Carlson, E.L. Kannenberg, J.R. Barr, A.E. Boyer, M. Gallegos-Candela, and C.P. Quinn. 2011. Antibody responses to a spore carbohydrate antigen as a marker of non-fatal inhalation anthrax in rhesus macaques. *Clin. Vaccine Immunol.* **18**(5): 743-748.

183 van der Wel, H., J.M. Johnson, Y. Xu, C.V. Karunaratne, K.D. Wilson, Y. Vohra, G.J. Boons, C.M. Taylor, B. Bendiak, and C.M. West. 2011. Requirements for Skp1 processing by cytosolic prolyl 4(*trans*)-hydroxylase and α-N-acetylglucosaminyltransferase enzymes involved in O_2-signaling in *Dictyostelium*. *Biochemistry* **50**(10): 1700-1713.

182 Oh H.B., F.E. Leach III, S. Arungundram, K. Al-Mafraji, A. Venot, G.J. Boons, and I.J. Amster. 2011. Multivariate analysis of electron detachment dissociation and infrared multiphoton dissociation mass spectra of heparan sulfate tetrasaccharides differing only in hexuronic acid stereochemistry. *J. Am. Soc. Mass Spectrom.* **22**(3): 582-590.

181 Sanders, B.C., F. Friscourt, P.A. Ledin, N.E. Mbua, S. Arumugam, J. Guo, T.J. Boltje, V.V. Popik, and G.J. Boons. 2011. Metal-free sequential [3+2]-dipolar cycloadditions using cyclooctynes

and 1,3-dipoles of different reactivity. *J. Am. Chem. Soc.* **133**(4): 949-957.

Highlighted in JACS Beta: *JACS* Select #18, 2012. The Chemistry-Glycobiology Frontier (B. Imperiali, Guest Editor).

180 Boltje, T.J., J.H. Kim, J. Park, and G.J. Boons. 2011. Stereoelectronic effects determine oxacarbenium vs β-sulfonium ion mediated glycosylations. *Org. Lett.* **13**(2): 284-287.

179 Ledin, P.A., F. Friscourt, J. Guo, and G.J. Boons. 2011. Convergent assembly and surface modification of multifunctional dendrimers by three consecutive click reactions. *Chem.-Eur. J.* **17**(3): 839-846.

178 Guo, J., G. Chen, X. Ning, M.A. Wolfert, X. Li, B. Xu, and G.J. Boons. 2010. Surface modification of polymeric micelles by strain-promoted alkyne-azide cycloadditions. *Chem.-Eur. J.* **16**(45): 13360-13366. ***Selected for frontispiece.***

Highlighted in Angew. Chem. Int. Ed.: Manova R., T.A. van Beek, and H. Zuilhof. 2011. Surface functionalization by strain-promoted alkyne-azide click reactions. *Angew. Chem. Int. Ed*. **50**(24): 5428-5430.

177 Friscourt, F. and G.J. Boons. 2010. One-pot three-step synthesis of 1,2,3-triazoles by copper-catalyzed cycloaddition of azides with alkynes formed by a Sonogashira cross-coupling and desilylation. *Org. Lett.* **12**(21): 4936-4939.

176 Boons G.J. 2010. Liposomes modified by carbohydrate ligands can target B-cells for the treatment of B-cell lymphomas. *Expert Rev. Vaccines.* **9**(11): 1251-1256.

175 Boltje, T.J., C. Li, and G.J. Boons. 2010. Versatile set of orthogonal protecting groups for the preparation of highly branched oligosaccharides. *Org. Lett.* **12**(20): 4636-4639.

174 Gaekwad J., Y. Zhang, W. Zhang, J, Reeves, M.A. Wolfert, and G.J. Boons. 2010. Differential induction of innate immune responses by synthetic lipid A derivatives. *J. Biol. Chem.* **285**(38): 29375-29386.

173 Berghaus L.J., J.N. Moore, D.J. Hurley, M.L. Vandenplas, B.P. Fortes, M.A. Wolfert, and G.J. Boons. 2010. Innate immune responses of primary murine macrophage-lineage cells and RAW 264.7 cells to ligands of Toll-like receptors 2, 3, and 4. *Comp. Immunol. Microbiol. Infect. Dis*. **33**(5): 443-454.

172 Boltje, T.J., J.H. Kim, J. Park, and G.J. Boons. 2010. Chiral-auxiliary-mediated 1,2-*cis*-glycosylations for the solid-supported synthesis of a biologically important branched α-glucan. *Nat. Chem.* **2**(7): 552-557.

171 Teo C.F., S. Ingale, M.A. Wolfert, G.A. Elsayed, L.G. Nöt, J.C. Chatham, L. Wells, and G.J. Boons. 2010. Glycopeptide-specific monoclonal antibodies suggest new roles for *O*-GlcNAc. *Nat. Chem. Biol.* **6**(5): 338-343.

170 Ning X., R.P. Temming, J. Dommerholt, J. Guo, D.B. Ania, M.F. Debets, M.A. Wolfert, G.J. Boons, and F.L. van Delft. 2010. Protein modification by strain-promoted alkyne–nitrone cycloaddition. *Angew. Chem. Int. Ed.* **49**(17): 3065-3068. ***Selected as "Hot Paper".***

169 Maiti, K.K., M. DeCastro, A.M. Abdel-Aal El-Sayed, M.I. Foote, M.A. Wolfert, and G.J. Boons. 2010. Chemical synthesis and proinflammatory responses of monophosphoryl lipid A adjuvant candidates. *Eur. J. Org. Chem.* (1): 80-91.

168 Arungundram, S., K. Al-Mafraji, J. Asong, F.E. Leach III, I.J. Amster, A. Venot, J.E. Turnbull, and G.J. Boons. 2009. Modular synthesis of heparan sulfate oligosaccharides for structure-activity relationship studies. *J. Am. Chem. Soc.* **131**(47): 17394-17405.

Highlighted in C&EN: Borman, S.A. 2009. Giant leap for obstinate targets. Sugar chemistry: Parallel combinatorial synthesis yields 12 hard-to-make oligosaccharides. *Chemical & Engineering News*, **87**(47): 10.

167 Poloukhtine, A.A., N.E. Mbua, M.A. Wolfert, G.J. Boons, and V.V. Popik. 2009. Selective labeling of living cells by a photo-triggered click reaction *J. Am. Chem. Soc.* **131**(43): 15769-15776.

166 Boltje, T.J., T. Buskas, and G.J. Boons. 2009. Opportunities and challenges in synthetic oligosaccharide and glycoconjugate research. *Nat. Chem.* **1**(8): 611-622.

165 Wang, Z.A., H. van der Wel, Y. Vohra, T. Buskas, G.J. Boons, and C.M. West. 2009. Role of a cytoplasmic dual-function glycosyltransferase in O_2 regulation of development in *Dictyostelium*. *J. Biol. Chem*. **284**(42): 28896-28904.

164 Buskas, T., P. Thompson, and G.J. Boons. 2009. Immunotherapy for cancer: Synthetic carbohydrate-based vaccines. *Chem. Commun.* (36): 5335-5349.

163 Vohra, Y., T. Buskas, and G.J. Boons. 2009. Rapid assembly of oligosaccharides: a highly convergent strategy for the assembly of a glycosylated amino acid derived from PSGL-1. *J. Org. Chem*. **74**(16): 6064-6071.

162 Leoff C., E. Saile, J. Rauvolfova, C.P. Quinn, A.R. Hoffmaster, W. Zhong, A.S. Mehta, G.J. Boons, R.W. Carlson, and E.L. Kannenberg. 2009. Secondary cell wall polysaccharides of *Bacillus anthracis* are antigens that contain specific epitopes which cross-react with three pathogenic *Bacillus cereus* strains that caused severe disease, and other epitopes common to all the *Bacillus cereus* strains tested. *Glycobiology* **19**(6): 665-673.

161 Marina-García N., L. Franchi, Y.G. Kim, Y. Hu, D.E. Smith, G.J. Boons, and G. Nunez. 2009. Clathrin- and dynamin-dependent endocytic pathway regulates muramyl dipeptide internalization and NOD2 activation. *J. Immunol.* **182**(7): 4321-4327.

160 Asong, J., M.A. Wolfert, K. Maiti, D. Miller, and G.J. Boons. 2009. Binding and cellular activation studies reveal that Toll-like receptor 2 can differentially recognize peptidoglycan from Gram-positive and Gram-negative bacteria. *J. Biol. Chem*. **284**(13): 8643-8653.

159 Chen, G., X. Ning, B. Park, G.J. Boons, and B. Xu. 2009. Simple, clickable protocol for atomic force microscopy tip modification and its application for trace ricin detection by recognition imaging. *Langmuir* **25**(5): 2860-2864.

158 Ferrand, Y., E. Klein, N.P. Barwell, M.P. Crump, J. Jimenez-Barbera, C. Vicent, G.J. Boons, S. Ingale, and A.P. Davis. 2009. A synthetic lectin for *O*-linked β-*N*-acetylglucosamine. *Angew. Chem. Int. Ed*. **48**(10): 1775-1779. ***Selected for inside cover picture.***

157 Ingale, S., M.A. Wolfert, T. Buskas, and G.J. Boons. 2009. Increasing the antigenicity of synthetic tumor-associated carbohydrate antigens by targeting Toll-like receptors. *ChemBioChem* **10**(3): 455-463.

156 Kuntz, D.A., W. Zhong, J. Guo, D.R. Rose, and G.J. Boons. 2009. The molecular basis of inhibition of Golgi α-mannosidase II by mannostatin A. *ChemBioChem* **10**(2): 268-277.

155 Park, J., T.J. Boltje, and G.J. Boons. 2008. Direct and stereoselective synthesis of α-linked 2-deoxyglycosides. *Org. Lett.* **10**(19): 4367-4370.

154 Zhang, Y., J. Gaekwad, M.A. Wolfert, and G.J. Boons. 2008. Synthetic tetra-acylated derivatives of lipid A from *Porphyromonas gingivalis* are antagonists of human TLR4. *Org. Biomol. Chem.* **6**(18): 3371-3381.

153 Vohra, Y., M. Vasan, A. Venot, and G.J. Boons. 2008. One-pot synthesis of oligosaccharides by combining reductive openings of benzylidene acetals and glycosylations. *Org. Lett.* **10**(15): 3247-3250.

152 Rauvolfova, J., A. Venot, and G.J. Boons. 2008. Chemo-enzymatic synthesis of C-9 acetylated sialosides. *Carbohydr. Res.* **343**(10-11): 1605-1611.

151 Vasan M., J. Rauvolfova, M.A. Wolfert, C. Leoff, E.L. Kannenberg, C.P. Quinn, R.W. Carlson, and G.J. Boons. 2008. Chemical synthesis and immunological properties of oligosaccharides derived from the vegetative cell wall of *Bacillus anthracis*. *ChemBioChem* **9**(11): 1716-1720.

150 Zhong W., D.A. Kuntz, B. Ember, H. Singh, K.W. Moremen, D.R. Rose, and G.J. Boons. 2008. Probing the substrate specificity of Golgi β-mannosidase II by use of synthetic oligosaccharides and a catalytic nucleophile mutant. *J. Am. Chem. Soc.* **130**(28): 8975-8983.

149 Marina-Garcia, N., L. Franchi, Y.G. Kim, D. Miller, C. McDonald, G.J. Boons, and G. Nunez. 2008. Pannexin-1-mediated intracellular delivery of muramyl dipeptide induces caspase-1 activation via Cryopyrin/NLRP3 independently of Nod2. *J. Immunol.* **180**(6): 4050-4057.

148 Ning, X., J. Guo, M.A. Wolfert, and G.J. Boons. 2008. Visualizing metabolically labeled glycoconjugates of living cells by copper-free and fast Huisgen cycloadditions. *Angew. Chem.*

Int. Ed. **47**(12): 2253-2255. ***Selected as a VIP paper.***

147 Rao, Y., T. Buskas, A. Albert, M.A. O'Neill, M.G. Hahn, and G.J. Boons. 2008. Synthesis and immunological properties of a tetrasaccharide portion of the B side chain of rhamnogalacturonan II (RG-II). *ChemBioChem* **9**(3): 381-388.

146 Zhang, Y., J. Gaekwad, M.A. Wolfert, and G.J. Boons. 2008. Innate immune responses of synthetic lipid A derivatives of *Neisseria meningitidis*. *Chem.-Eur. J.* **14**(2): 558-569.

145 Ingale, S., M.A. Wolfert, J. Gaekwad, T. Buskas, and G.J. Boons. 2007. Robust immune responses elicited by a fully synthetic three-component vaccine. *Nat. Chem. Biol*. **3**(10): 663-667.

Highlighted in Nat. Chem. Biol.: Bundle, D.R. 2007. A carbohydrate vaccine exceeds the sum of its parts. *Nat. Chem. Biol.* **3**(10): 605-606.

144 Li, X., S. Wang, J. Qi, S.F. Echtenkamp, R. Chatterjee, M. Wang, G.J. Boons, R. Dziarski, and D. Gupta. 2007. Zebrafish peptidoglycan recognition proteins are bactericidal amidases essential for defense against bacterial infections. *Immunity*. **27**(3): 518-529.

143 Rao, Y. and G.J. Boons. 2007. A highly convergent chemical synthesis of conformational epitopes of rhamnogalacturonan II. *Angew. Chem. Int. Ed*. **46**(32): 6148-6151.

142 Zhang, Y., M.A. Wolfert, and G.J. Boons. 2007. The influence of the long chain fatty acid on the antagonistic activities of *Rhizobium sin*-1 lipid A. *Bioorg. Med. Chem.* **15**(14): 4800-4812.

141 Vasan M., M.A. Wolfert, and G.J. Boons. 2007. Agonistic and antagonistic properties of a *Rhizobium sin*-1 lipid A modified by an ether-linked lipid. *Org. Biomol. Chem.* **5**(13): 2087-2097.

140 Cho, S., Q. Wang, C.P. Swaminathan, D. Hesek, M. Lee, G.J. Boons, S. Mobashery, and R.A. Mariuzza. 2007. Structural insights into the bacterial mechanism of human peptidoglycan recognition proteins. *Proc. Natl. Acad. Sci. U. S. A.* **104**(21): 8761-8766.

139 Park, J., S. Kawatkar, J.H. Kim, and G.J. Boons. 2007. Stereoselective glycosylations of 2-azido-2-deoxy-glucosides using intermediate sulfonium ions. *Org. Lett.* **9**(10): 1959-1962.

138 Zhang, Y., J. Gaekwad, M.A. Wolfert, and G.J. Boons. 2007. Modulation of innate immune responses with synthetic lipid A derivatives. *J. Am. Chem. Soc.* **129**(16): 5200-5216.

137 Liu, S., A. Venot, L. Meng, F. Tian, K.W. Moremen, G.J. Boons, and J.H. Prestegard. 2007. Spin-labeled analogs of CMP-NeuAc as NMR probes of the α-2,6-sialyltransferase ST6Gal I. *Chem. Biol.* **14**(4): 409-418.

136 Wolfert, M.A., A. Roychowdhury, and G.J. Boons. 2007. Modifications of the structure of peptidoglycan is a strategy to avoid detection by nucleotide-binding oligomerization domain protein 1. *Infect. Immun.* **75**(2): 706-713. ***Selected for IAI Spotlight.***

135 Mehta, A., E. Saile, W. Zhong, T. Buskas, R. Carlson, E. Kannenberg, Y. Reed, C.P. Quinn, and G.J. Boons. 2006. Synthesis and antigenic analysis of the Bc1A glycoprotein oligosaccharide from the *Bacillus anthracis* exosporium. *Chem.-Eur. J.* **12**(36): 9136-9149. ***Selected for frontispiece.***

134 Ingale, S., T. Buskas, and G.J. Boons. 2006. Synthesis of glyco(lipo)peptides by liposome-mediated native chemical ligation *Org. Lett.* **8**(25): 5785-5788.

133 Kim, J.H., H. Yang, V. Khot, D. Whitfield, and G.J. Boons. 2006. Stereoselective glycosylations using (*R*)- or (*S*)-(ethoxycarbonyl)benzyl chiral auxiliaries at C-2 of glycopyranosyl donors. *Eur. J. Org. Chem.* (22): 5007-5028. ***Selected for cover picture.***

132 Zhu, X., S. Kawatkar, Y. Rao, and G.J. Boons. 2006. Practical approach for the stereoselective introduction of β-arabinofuranosides. *J. Am. Chem. Soc.* **128**(36): 11948-11957.

Highlighted in C&EN: Borman, S.A. 2007. Bacterial wall component made. *Chemical & Engineering News* **85**(32): 6.

131 Alphey, M.S., A. Burton, M.D. Urbaniak, G.J. Boons, M.A. Ferguson, and W.N. Hunter. 2006. *Tyrpanosoma brucei* UDP-galactose-4'-epimerase in ternary complex with NAD^+ and the substrate analogue UDP-4-deoxy-4-fluoro-α-D-galactose. *Acta Crystallograph. Sect. F Struct. Biol. Cryst. Commun.* **62**(9): 829-834.

130 Guo, J., J. Asong, and G.J. Boons. 2006. Selective inhibition of glycosidases by feedback prodrugs. *Angew. Chem. Int. Ed*. **45**(32): 5345-5348.

129 Buskas, T., S. Ingale, and G.J. Boons. 2006. Glycopeptides as versatile tools for glycobiology. *Glycobiology* **16**(8): 113R-136R.

128 Kawatkar, S., D.A. Kuntz, R.J. Woods, D.R. Rose, and G.J. Boons. 2006. Structural basis of the inhibition of Golgi α-mannosidase II by mannostatin A and the role of the thiomethyl moiety in protein-ligand interactions. *J. Am. Chem. Soc.* **128**(25): 8310-8319.

127 Buts, L., A. Garcia-Pino, A. Imberty, N. Amiot, G.J. Boons, S. Beeckmans, W. Versees, L. Wyns, and R. Loris. 2006. Structural basis for the recognition of complex-type biantennary oligosaccharides by *Pterocarpus angolensis* lectin. *FEBS J.* **273**(11): 2407-2420.

126 Guan, R., P.H. Brown, C.P. Swaminathan, A. Roychowdhury, G.J. Boons, and R.A. Mariuzza. 2006. Crystal structure of human peptidoglycan recognition protein Iα bound to a muramyl pentapeptide from Gram-positive bacteria. *Protein Science* **15**(5): 1199-1206.

125 Rao, Y., A. Venot, E.E. Swayze, R.H. Griffey, and G.J. Boons. 2006. Trisaccharide mimetics of the aminoglycoside antibiotic neomycin. *Org. Biomol. Chem*. **4**(7): 1328-1337.

124 Swaminathan, C.P., P.H. Brown, A. Roychowdhury, Q. Wang, R. Guan, N. Silverman, W.E. Goldman, G.J. Boons, and R.A. Mariuzza. 2006. Dual strategies for peptidoglycan discrimination by peptidoglycan recognition proteins (PGRPs). *Proc. Natl. Acad. Sci. U. S. A.* **103**(3): 684-689.

123 Lee, H.S., M.A. Wolfert, Y. Zhang, and G.J. Boons. 2006. The 2-aminogluconate isomer of *Rhizobium sin*-1 lipid A can antagonize TNF-α production induced by enteric LPS. *ChemBioChem* **7**(1): 140-148.

122 Kumar, S., A. Roychowdhury, B. Ember, Q. Wang, R. Guan, R.A. Mariuzza, and G.J. Boons. 2005. Selective recognition of synthetic lysine and *meso*-diaminopimelic acid-type peptidoglycan fragments by human peptidoglycan recognition protein Iα and S. *J. Biol. Chem.* **280**(44): 37005-37012.

121 Roychowdhury, A., M.A. Wolfert, and G.J. Boons. 2005. Synthesis and pro-inflammatory properties of muramyl tripeptides containing lysine and diaminopimelic acid moieties. *ChemBioChem* **6**(11): 2088-2097.

120 Buskas, T., S. Ingale, and G.J. Boons. 2005. Towards a fully synthetic carbohydrate-based anticancer vaccine: Synthesis and immunological evaluation of a lipidated glycopeptide containing the tumor-associated Tn-antigen. *Angew. Chem. Int. Ed*. **44**(37): 5985-5988. ***Selected as a VIP paper.***

Highlighted in C&EN: Borman, S.A. 2005. Cancer vaccine is best in class: Three-part carbohydrate vaccine elicits strong anticancer response. *Chemical & Engineering News* **83**(37): 10.

119 Buskas, T., Y. Li, and G.J. Boons. 2005. Synthesis of a dimeric Lewis antigen and the evaluation of the epitope specificity of antibodies elicited in mice. *Chem.-Eur. J.* **11**(18): 5457-5467.

118 Kim, J.H., H. Yang, J. Park, and G.J. Boons. 2005. A general strategy for stereoselective glycosylations. *J. Am. Chem. Soc.* **127**(34): 12090-12097.

Highlighted in C&EN and in Nature: Borman, S.A. 2005. New approach to glycosylation: Technique could facilitate one-pot and automated syntheses of carbohydrates. *Chemical & Engineering News* **83**(34): 11; Flitsch, S.L. 2005. Synthetic chemistry: Glycosylation with a twist. *Nature* **437**: 201-202.

117 Cato, D., T. Buskas, and G.J. Boons. 2005. Highly efficient stereospecific preparation of Tn and TF building blocks using thioglycosyl donors and the Ph_2SO/Tf_2O promoter system. *J. Carbohydr. Chem*. **24**: 503-516.

116 Siriwardena, A., H. Strachan, S. El-Daher, G. Way, B. Winchester, J. Glushka, K. Moremen, and G.J. Boons. 2005. Potent and selective inhibition of class II α-D-mannosidase activity by a bicyclic sulfonium salt. *ChemBioChem* **6**(5): 845-848.

115 Roychowdhury, A. and G.J. Boons. 2005. The synthesis of diaminopimelic acid containing peptidoglycan fragments using metathesis cross couplings. *Tetrahedron Lett*. **46**(10): 1675-1678.

114 Majumdar, D., G.A. Elsayed, T. Buskas, and G.J. Boons. 2005. Synthesis of proteophosphoglycans of *Leishmania major* and *Leishmania mexicana*. *J. Org. Chem*. **70**(5): 1691-1697.

113 Guan, R., A. Roychowdhury, B. Ember, S. Kumar, G.J. Boons, and R.A. Mariuzza. 2005. Crystal structure of a peptidoglycan recognition protein (PGRP) in complex with a muramyl tripeptide from Gram-positive bacteria. *J. Endotoxin Res*. **11**(1): 41-46.

112 Kim, J.H., H. Yang, and G.J. Boons. 2005. Stereoselective glycosylations with chiral auxiliaries. *Angew. Chem. Int. Ed.* **44**(6): 947-949.

Highlighted in Nature: Research Highlights. 2005 *Nature* **436**: 757.

111 Guan, R., A. Roychowdhury, B. Ember, S. Kumar, G.J. Boons, and R.A. Mariuzza. 2004. Structural basis for peptidoglycan binding by peptidoglycan recognition proteins. *Proc. Natl. Acad. Sci. U. S. A.* **101**(49): 17168-17173.

110 Santhanam, B., M.A. Wolfert, J.N. Moore, and G.J. Boons. 2004. Synthesis and biological evaluation of a lipid A derivative that contains an aminogluconate moiety. *Chem.-Eur. J.* **10**(19): 4798-4807.

109 Santhanam, B. and G.J. Boons. 2004. Preparation of a lipid A derivative that contains a 27-hydroxyoctacosanoic acid moiety. *Org. Lett.* **6**(19): 3333-3336.

108 Li, B., S.P. Kawatkar, S. George, H. Strachan, R.J. Woods, A. Siriwardena, K.W. Moremen, and G.J. Boons. 2004. Inhibition of Golgi mannosidase II with mannostatin A analogs: Synthesis, biological evaluation and structure activity relationship studies. *ChemBioChem* **5**(9): 1220-1227.

107 Venot, A., E.E. Swayze, R.H. Griffey, and G.J. Boons. 2004. Disaccharide mimetics of the aminoglycoside antibiotic neamine. *ChemBioChem* **5**(9): 1228-1236.

106 Buskas, T., Y.H. Li, and G.J. Boons. 2004. The immunogenicity of the tumor-associated antigen Lewis^y may be suppressed by a bifunctional cross-linker required for coupling to a carrier protein. *Chem.-Eur. J.* **10**(14): 3517-3524.

105 Galan, M.C., A.P. Venot, and G.J.Boons. 2004. The design and synthesis of a selective inhibitor of fucosyltransferase VI. *Org. & Biomol. Chem*. **2(**9): 1376-1380.

104 Galan, M.C., C.S. Dodsen, A.P. Venot, and G.J. Boons. 2004. Glycosyltransferase activity can be selectively modulated by chemical modificiations of acceptor substrates. *Biorg. Med. Chem. Lett.* **14**(9): 2205-2208.

103 Narendran P., K. Elsegood, N.J. Leech, W.M. Macindoe, G.J. Boons, and C.M. Dayan. 2004. Dendritic cell-based assays, but not mannosylation of antigen, improves detection of T-cell responses to proinsulin in type 1 diabetes. *Immunology*. **111**(4): 422-429.

102 Watt, G. and G.J. Boons. 2004. A convergent strategy for the preparation of *N*-glycan core di, tri- and pentasaccharide thioaldoses for the site-specific glycosylation of peptides and proteins bearing free cysteines. *Carbohydr. Res.* **339**(2): 181-193. ***Selected for cover picture.***

101 Prabhu, A., A.P. Venot, and G.J. Boons. 2003. A new set of orthogonal protecting groups for the modular synthesis of heparan sulfate fragments. *Org. Lett*. **5**(26): 4975-4978.

100 Galan, M.C., A.P. Venot, J. Glushka, A. Imberty, and G.J. Boons. 2003. Chemo-enzymatic synthesis of conformationally constrained oligosaccharides. *Org. & Biomol. Chem*. **1**(22): 3891-3899.

99 Majumdar, D., T. Zhu, and G.J. Boons. 2003. Synthesis of oligosaccharides on soluble high-molecular-weight branched polymers in combination with purification by nanofiltration. *Org. Lett*. **5**(20): 3591-3594.

98 Watt, G., J. Lund, M. Levens, V.S.K. Kolli, R. Jefferis, and G.J. Boons. 2003. Site-specific glycosylation of an aglycosylated human IgG1-Fc antibody protein generates

neoglycoproteins with enhanced function. *Chem. & Biol*. **10**(9): 807-814.

97 Elsayed, G.A. and G.J. Boons. 2003. Chemical synthesis of α-D-mannosylphosphate serine derivatives: A new class of synthetic glycopeptides. *Synlett.* (9): 1373-1375.

96 Pinhal-Enfield, G., M. Ramanathan, G. Hasko, S.N. Vogel, A.L. Salzman, G.J. Boons, and S.J. Leibovich. 2003. An angiogenic switch in macrophages involving synergy between Toll-like receptors 2, 4, 7, and 9, and adenosine A_{2A} receptors. *Am. J. Path*. **163(**2): 711-721.

95 Galan, M.C., A.P. Venot, and G.J. Boons. 2003. Glycosyltransferase activity can be modulated by small conformational changes of acceptor substrates. *Biochemistry* **42**(28): 8522-8529.

94 Thobhani, S., B. Ember, A. Siriwardena, and G.J. Boons. 2003. Multivalency and the mode of action of bacterial sialidases. *J. Am. Chem. Soc.* **125(**24): 7154-7155.

Highlighted in C&EN: Science Concentrates. 2003. Polyvalent ligand inhibits cholera enzyme. *Chemical & Engineering News* **81**(25): 38.

93 Demchenko, A.V, M.A. Wolfert, B. Santhanam, J.N. Moore, and G.J. Boons. 2003. Synthesis and biological evaluation of *Rhizobium sin*-1 lipid A derivatives. *J. Am. Chem. Soc.* **125(**20): 6103-6112.

92 Geurtsen, R. and G.J. Boons. 2002. Chemoselective glycosylations of sterically hindered glycosyl acceptors. *Tetrahedron Lett*. **43**(55): 9429-9431.

91 Arranz-Plaza, E., A.S. Tracy, A. Siriwardena, J.M. Pierce, and G.J. Boons. 2002. High-avidity, low-affinity multivalent interactions and the block to polyspermy in *Xenopus laevis*. *J. Am. Chem. Soc*. **124(**44): 13035-13046.

90 Roychowdhury, A., A. Siriwardena, and G.J. Boons. 2002. A highly convergent approach for the synthesis of disaccharide repeating units of peptidoglycan. *Tetrahedron Lett.* **43**(43): 7805-7807.

89 Wolfert, M.A., T.F. Murray, G.J. Boons, and J.N. Moore. 2002. The origin of the synergistic effect of muramyl dipeptide with endotoxin and peptidoglycan. *J. Biol. Chem*. **277**(42): 39179-39186.

88 Haller, M.F. and G.J. Boons. 2002. Selectively protected disaccharide building blocks for modular synthesis of heparin fragments. *Eur. J. Org. Chem.* (13): 2033-2038.

87 Elsayed, G.A., T. Zhu, and G.J. Boons. 2002. Demixing libraries of saccharides using a multi-linker approach in combination with a soluble polymeric support. *Tetrahedron Lett*. **43**(26): 4691-4694.

86 Galan, M.C., A.P. Venot, J. Glushka, A. Imberty, and G.J. Boons. 2002. α-(2,6)-Sialyltransferase-catalyzed sialylations of conformationally constrained oligosaccharides. *J. Am. Chem. Soc.* **124**(21): 5964-5973.

85 Geurtsen, R. and G.J. Boons. 2002. Regioselective glycosylations in solution and on soluble and insoluble polymeric support. *Eur. J. Org. Chem.* (9): 1473-1477.

84 De Meo, C., A.V. Demchenko, and G.J. Boons. 2002. Triflouroacetamido substituted sialyl donors for the preparation of sialyl galactosides. *Aus. J. Chem*. **55(**1-2): 131-134.

83 Zhu, T. and G.J. Boons. 2001. Thioglycosides protected as trans-2,3-cyclic carbonates in chemoselective glycosylations. *Org. Lett.* **3(**26): 4201-4203.

82 Clarke, C., R.J. Woods, J. Glushka, A. Cooper, M.A. Nutley, and G.J. Boons. 2001. Involvement of water in carbohydrate-protein binding. *J. Am. Chem. Soc*. **123(**49): 12238-12247.

81 Kearns, D.B., A. Venot, P.J. Bonner, B. Stevens, G.J. Boons, and L.J. Shimkets. 2001. Identification of a developmental chemoattractant in *Myxococcus xanthus* through metabolic engineering. *Proc. Natl. Acad. Sci. U. S. A*. **98(**24): 13990-13994.

80 Arranz, E. and G.J. Boons. 2001. The 2-(allyloxy) phenyl acetyl ester as a new relay protecting group for oligosaccharide synthesis. *Tetrahedron Lett*. **42(**37): 6469-6471.

79 Siriwardena, A., M.R. Jørgensen, M.A. Wolfert, M.L. Vandenplas, J.N. Moore, and G.J. Boons. 2001. Synthesis and proinflammatory effects of peptidoglycan-derived neoglycopeptide polymers. *J. Am. Chem. Soc.* **123(**33): 8145-8146.

78 De Meo, C., A.V. Demchenko, and G.J. Boons. 2001. A stereoselective approach for the

synthesis of α-sialosides. *J. Org. Chem*. **66**(16): 5490-5497.
77 McWatt, M. and G.J. Boons. 2001. Parallel combinatorial synthesis of glycodendrimers and their hydrogelation properties. *Eur. J. Org. Chem.* (13): 2535-2545.
76 Zhu, T. and G.J. Boons. 2001. A highly efficient synthetic strategy for polymeric support synthesis of Le^x, Le^y, and H-type 2 oligosaccharides. *Chem.-Eur. J.* **7**(11): 2382-2389.
75 Demchenko, A.V. and G.J. Boons. 2001. A highly convergent synthesis of a complex oligosaccharide derived from group B type III *Streptococcus*. *J. Org. Chem*. **66**(8): 2547-2554.
74 Haller, M. and G.J. Boons. 2001. Towards a modular approach for heparin synthesis. *J. Chem. Soc., Perkin Trans. 1* (8): 814-822.
73 Boons, G.J. and A.V. Demchenko. Recent advances in *O*-sialylation. 2000. *Chem. Rev.* **100(**12): 4539-4565.
72 Zhu, T. and G.J. Boons. 2000. Intermolecular aglycon transfer of ethyl thioglycosides can be prevented by judicious choice of protecting groups. *Carbohydr. Res.* **329**(4): 709-715.
71 Zhu, T. and G.J. Boons. 2000. A novel and efficient synthesis of a dimeric Le^x oligosaccharide on polymeric support. *J. Am. Chem. Soc*. **122**(41): 10222-10223.
70 Bai, Y., G.J. Boons, A. Burton, M. Johnson, and M. Haller. 2000. Vinyl glycosides in oligosaccharide synthesis . 6. 3-Buten-2-yl 2-azido-2-deoxy glycosides and 3-buten-2-yl-phthalimido-2-deoxy glycosides as novel glycosyl donors. *J. Carbohydr. Chem.* **19**(7): 939-958.
69 Belogi, G., T. Zhu, and G.J. Boons. 2000. Polymer-supported oligosaccharide synthesis by a loading-release-reloading strategy. *Tetrahedron Lett.* **41**(36): 6969-6972.
68 Belogi, G., T. Zhu, and G.J. Boons. 2000. Polystyrylboronic acid as a reusable polymeric support for oligosaccharide synthesis. *Tetrahedron Lett.* **41**(36): 6965-6968.
67 Reichel, F., A.M. Roelofsen, H.P.M. Geurts, S.J. van der Gaast, M.C. Feiters, and G.J. Boons. 2000. Synthesis and supramolecular characterization of a novel class of glycopyranosyl-containing amphiphiles. *J. Org. Chem*. **65**(11): 3357-3366.
66 Zhu, T. and G.J. Boons. 2000. A new set of orthogonal protecting groups for oligosaccharide synthesis on a polymeric support. *Tetrahedron: Asymmetry* **11**(1): 199-205.
65 Boons, G.J. 1999. Combinatorial approaches in oligosaccharide synthesis. *Carbohydrates in Europe* **27**: 28-32.
64 Zhu, T. and G.J. Boons. 1999. A two directional and highly convergent approach for the synthesis of the tumor-associated antigen Globo-H. *Angew. Chem. Int. Ed.* **38**(23): 3495-3497.
63 Geurtsen, R., F. Côté, M.G. Hahn, and G.J. Boons. 1999. Chemoselective glycosylation strategy for the convergent assembly of phytoalexin-elicitor active oligosaccharides and their photoreactive derivatives. *J. Org. Chem.* **64**(21): 7828-7835.
62 Reichel, F., A.M. Roelofsen, H.P.M. Geurts, T.I. Hämäläinen, M.C. Feiters, and G.J. Boons. 1999. Stereochemical dependence of the self-assembly of the immunoadjuvants Pam_3Cys and Pam_3Cys-Ser. *J. Am. Chem. Soc.* **121**(35): 7989-7997.
61 Demchenko, A.V., E. Rousson, and G.J. Boons. 1999. Stereoselective 1,2-*cis*-galactosylation assisted by remote neighboring group participation and solvent effects. *Tetrahedron Lett.* **40**(36): 6523-6526.
60 Navarre, N., N. Amiot, A. van Oijen, A. Imberty, A. Poveda, J. Jiménez-Barbero, A. Cooper, M.A. Nutley, and G.J. Boons. 1999. Synthesis and conformational analysis of a conformationally constrained trisaccharide, and complexation properties with concanavalin A. *Chem.-Eur. J.* **5**(8): 2281-2294.
59 Demchenko, A.V. and G.J. Boons. 1999. A novel direct glycosylation approach for the synthesis of dimers of *N*-acetylneuraminic acid. *Chem.-Eur. J.* **5**(4): 1278-1283.
58 Johnson, M., C. Arles, and G.J. Boons. 1998. Vinyl glycosides in oligosaccharide synthesis .5. A latent-active glycosylation strategy for the preparation of branched trisaccharide libraries. *Tetrahedron Lett.* **39**(52): 9801-9804.

57 Reichel F. and G.J. Boons. 1998. Sweet promise. *Chemistry in Britain* **34**(9): 43-46.
56 Zhu, T. and G.J. Boons. 1998. A two-directional approach for the solid-phase synthesis of trisaccharide libraries. *Angew. Chem. Int. Ed*. **37**(13-14): 1898-1900.
55 Bowers, S.G., D.M. Coe, and G.J. Boons. 1998. Application of the 2,5-dimethylpyrrole group as a new and orthogonal amine-protecting group in oligosaccharide synthesis*. J. Org. Chem.* **63**(14): 4570-4571.
54 Demchenko, A.V. and G.J. Boons. 1998. A novel and versatile glycosyl donor for the preparation of glycosides of *N*-acetylneuraminic acid. *Tetrahedron Lett*. **39**(19): 3065-3068.
53 Zhu, T. and G.J. Boons. 1998. A two directional glycosylation strategy for the convergent assembly of oligosaccharides. *Tetrahedron Lett*. **39**(15): 2187-2190.
52 Macindoe, W.M., A.H. van Oijen, and G.J. Boons. 1998. A unique and highly facile method for synthesizing disulfide linked neoglycoconjugates: A new approach for remodelling of peptides and proteins. *Chem. Commun*. (7): 847-848.
51 Zhu, T. and G.J. Boons. 1998. Two-directional, convergent synthesis of a pentasaccharide that is involved in the hyperacute rejection response in xenotransplantation from pig to man. *J. Chem. Soc., Perkin Trans. 1* (5): 857-861.
50 Gibson, R.R., R.P. Dickinson, and G.J. Boons. 1997. Vinyl glycosides in oligosaccharide synthesis .4. Glycosidase-catalysed preparation of substituted allyl glycosides. *J. Chem. Soc., Perkin Trans. 1* (22): 3357-3360.
49 Geurtsen, R., D.S. Holmes, and G.J. Boons. 1997. Chemoselective glycosylations .2. Differences in size of anomeric leaving groups can be exploited in chemoselective glycosylations. *J. Org. Chem*. **62**(23): 8145-8154.
48 Reichel, F., P.R. Ashton, and G.J. Boons. 1997. Synthetic carbohydrate-based vaccines: Synthesis of an L-*glycero*-D-*manno*-heptose antigen-T-epitope-lipopeptide conjugate. *Chem. Commun.* (21): 2087-2088.
47 Burton, A., P. Wyatt, and G.J. Boons. 1997. Preparation of fluorinated galactosyl nucleoside diphosphates to study the mechanism of the enzyme galactopyranose mutase. *J. Chem. Soc., Perkin Trans. 1* (16)*:* 2375-2382.
46 Demchenko, A.V., T. Stauch, and G.J. Boons. 1997. Solvent and other effects on the stereoselectivity of thioglycoside glycosidations. *Synlett* (7): 818-820.
45 Boons, G.J. and T. Zhu. 1997. Novel regioselective glycosylations for the convergent and chemoselective assembly of oligosaccharides. *Synlett* (7): 809-811.
44 Boons, G.J., S. Bowers, and D.M. Coe. 1997. Trityl ethers in oligosaccharide synthesis: A novel strategy for the convergent assembly of oligosaccharides. *Tetrahedron Lett.* **38**(21): 3773-3776
43 Navarre, N., A.H. van Oijen, and G.J. Boons. 1997. The design and synthesis of a conformationally constrained trisaccharide for probing carbohydrate-protein interactions. *Tetrahedron Lett.* **38**(11): 2023-2026.
42 Demchenko, A.V. and G.J. Boons. 1997. A highly convergent synthesis of a hexasaccharide derived from the oligosaccharide of group B type III S*treptococcus*. *Tetrahedron Lett.* **38**(9): 1629-1632.
41 Boons, G.J., B. Heskamp, and F. Hout. 1996. Vinyl glycosides in oligosaccharide synthesis: A strategy for the preparation of trisaccharide libraries based on latent-active glycosylation. *Angew. Chem. Int. Ed.* **35**(23-24): 2845-2847.
40 Boons, G.J. and T. Stauch. 1996. Stereoselectivity in glycosidic bond formation: Studies on the anomerisation of thioglycosides. *Synlett* (9): 906-908.
39 Boons, G.J. 1996. Synthetic oligosaccharides: Recent advances. *Drug Discovery Today* **1**(8): 331-342.
38 Boons, G.J. and S. Isles. 1996. Vinyl glycosides in oligosaccharide synthesis .2. The use of allyl and vinyl glocosides in oligosaccharide synthesis. *J. Org. Chem.* **61**(13): 4262-4271.
37 Boons, G.J. 1996. Recent developments in chemical oligosaccharide synthesis. *Contemp. Org.*

Synth. **3**(3): 173-200.

36 Boons, G.J., R. Eveson, S. Smith, and T. Stauch. 1996. A critical evaluation of the cationic coupling of 4-acetoxy-1,3-dioxanes. *Synlett* (6): 536-538.

35 Boons, G.J., A. Burton, and P. Wyatt. 1996. Glycosyl phosphates: A new latent-active anomeric phosphorylation strategy. *Synlett* (4): 310-312.

34 Parsons, N.J., G.J. Boons, P.R. Ashton, P.D. Redfern, P. Quirk, Y. Gao, C. Constantinidou, J. Patel, J. Bramley, J.A. Cole, and H. Smith. 1996. Lactic acid is the factor in blood cell extracts which enhances the ability of CMP-NANA to sialylate gonococcal lipopolysaccharide and induce serum resistance. *Microb. Pathog.* **20**(2): 87-100.

33 Boons, G.J. 1996. Strategies in oligosaccharide synthesis. *Tetrahedron* **52**(4): 1095-1121.

32 Boons, G.J., A. Burton, and S. Isles. 1996. A new procedure for the isomerisation of substituted and unsubstituted allyl ethers of carbohydrates. *Chem. Commun.* (2): 141-142.

31 Boons, G.J., R. Geurtsen, and E. Holmes. 1995. Chemoselective glycosylations .1. Differences in size of anomeric leaving groups can be exploited in chemoselective glycosylations. *Tetrahedron Lett.* **36**(35): 6325-6328.

30 Boons, G.J., S. Isles, and P. Setälä. 1995. An improved procedure for the preparation of 1,6-anhydro sugars. *Synlett* (7): 755-756.

29 Boons, G.J., J.A. Clase, I.C. Lennon, S.V. Ley, and J. Staunton. 1995. Biosynthesis of tetronasin .4. Preparation of deuterium labelled C19-C26, C17-C26, C11-C26 and C3-C26 polyketide fragments as putative bisynthetic precursors of the ionophore antibiotic tetronasin (ICI 139603). *Tetrahedron* **51**(18): 5417-5446.

28 Boons, G.J., R. Downham, K.S. Kim, S.V. Ley, and M. Woods. 1994. Dispiroketals in synthesis .10. Further reactions of dispoke protected lactate and glycolate enolates. *Tetrahedron* **50**(24): 7157-7176.

27 Boons, G.J. and S. Isles. 1994. Vinyl glycosides in oligosaccharide synthesis .1. A new latent-active glycosylation strategy. *Tetrahedron Lett.* **35**(21): 3593-3596.

26 Boons, G.J., I.C. Lennon, S.V. Ley, E.S.E. Owen, J. Staunton, and D.J. Wadsworth. 1994. Novel polyene cyclisation routes to the acyl tetronic acid ionophore tetronasin (ICI M139603). *Tetrahedron Lett.* **35**(2): 323-326.

25 Boons, G.J., D.S. Brown, J.A. Clase, I.C. Lennon, and S.V. Ley. 1994. Two new routes to the C19-C26 tetrahydrofuran fragment of the acyl tetronic acid ionophore tetronasin (ICI M139603). *Tetrahedron Lett.* **35**(2): 319-322.

24 Boons, G.J., P. Grice, R. Leslie, S.V. Ley, and L.L. Yeung. 1993. Dispiroketals in synthesis .5. A new opportunity for oligosaccharide synthesis using differentially activated glycosyl donors and acceptors. *Tetrahedron Lett.* **34**(52): 8523-8526.

23 Boons, G.J., G.H. Castle, J.A. Clase, P. Grice, S.V. Ley, and C. Pinel. 1993. Selective acylation and alkylation reactions of diols using dibutyltin dimethoxide. *Synlett* (12): 913-914.

22 Boons, G.J., D.A. Entwistle, S.V. Ley, and M. Woods. 1993. Dispiroketals in synthesis .4. Enantioselective desymmertrization of glycerol using a C_2-symmetric disubstituted *bis*-dihydropyran. *Tetrahedron Lett.* **34**(35): 5649-5652.

21 Smid, P., F.J.M. Schippers, H.J.G. Broxterman, G.J.P.H. Boons, G.A. van der Marel, and J.H. van Boom. 1993. Use of (chloromethyl)dimethylphenylsilane in sugar chemistry. Stereo-controlled approach to destomic acid and 1-deoxy-nojirimycin. *Recl. Trav. Chim. Pays-Bas* **112**(7-8): 451-456.

20 Ley, S.V., G.J. Boons, R. Leslie, M. Woods, and D.M. Hollinshead. 1993. Dispiroketals in synthesis .3. Selective protection of diequatorial vicinal diols in carbohydrates. *Synthesis* (7): 689-692.

19 Smid, P., W.P.A. Jörning, A.M.G. van Duuren, G.J.P.H. Boons, G. A. van der Marel, and J.H. van Boom. 1992. Stereoselective synthesis of a dimer containing an α-linked 2-acetamido-4-amino-2,4,6-trideoxy-D-galactopyranose (sug_p) unit. *J. Carbohydrate Chem.* **11**(7): 849-865.

18 Noort, D., N.C.R. van Straten, G.J.P.H. Boons, G.A. van der Marel, X. Bossuyt, N. Blanckaert,

G.J. Mulder, and J.H. van Boom. 1992. Synthesis of a potential inhibitor of UDP-glycoronosyltransferase. *Biomed. Chem. Lett.* **2**(6): 583-588.

17 van der Klein, P.A.M., W. Filemon, G.J.P.H. Boons, G.H. Veeneman, G.A. van der Marel, and J.H. van Boom. 1992. Synthesis of a cell wall component of *Haemophilus (Actionobacillus) Pleuropneumoniae* serotype 5. *Tetrahedron* **48**(22): 4649-4658.

16 Boons, G.J.P.H., M. Overhand, G.A. van der Marel, and J.H. van Boom. 1992. Synthesis of two branched heptopyranoside (L,D-Hep*p*)-containing trisaccharides of the inner-core region of *Citrobacter PCM* 1487. *Recl. Trav. Chim. Pays-Bas* **111**(3): 144-148.

15 Boons, G.J.P.H., F.L. van Delft, P.A.M. van der Klein, G.A. van der Marel, and J.H. van Boom. 1992. Synthesis of LD-Hep*p* and KDO containing disaccharide and tetrasaccharide derivatives of *Neisseria meningitidis* inner-core region *via* iodonium ion promoted glycosidations. *Tetrahedron* **48**(5): 885-904.

14 Boons, G.J.P.H., R. Steyger, M. Overhand, G.A. van der Marel, and J.H. van Boom. 1991. Synthesis of naturally occurring LD-Hep*p* containing disaccharides. *J. Carbohydr. Chem.* **10**(6): 995-1007.

13 Verheul, A.F.M., G.J.P.H. Boons, G.A. van der Marel, J.H. van Boom, H.J. Jennings, H. Snippe, J. Verhoef. P. Hoogerhout, and J.T. Poolman. 1991. Minimal oligosaccharide structures required for induction of immune responses against meningococcal immunotype L1, L2, and L3,7,9 lipopolysaccharides determined by using synthetic oligosaccharide-protein conjugates. *Infect. Immun.* **59**(10): 3566-3573.

12 Boons, G.J.P.H., P. Hoogerhout, J.T. Poolman, G.A. van der Marel, and J.H. van Boom. 1991. Preparation of a well-defined sugar-peptide conjugate: A possible approach to a synthetic vaccine against *Neisseria meningitidis*. *Bioorg. Med. Chem. Lett.* **1**(6): 303-308.

11 Verheul, A.F.M., H. Snippe, J. Verhoef, P. Hoogerhout, J.T. Poolman, G.J.P.H. Boons, G.A. van der Marel, and J.H. van Boom. 1991. Immunogenicity of meningococcal LPS derived oligosaccharide-protein conjugates using isolated and synthetic oligosaccharides. *Neisseriae 1990*: 301-306.

10 Boons, G.J.P.H., C.J.J. Elie, G.A. van der Marel, and J.H. van Boom. 1990. Use of (phenyldimethylsilyl)methoxymethyl and (phenyldimethylsilyl)methyl ethers as protecting groups for sugar hydroxyls. *Tetrahedron Lett.* **31**(15): 2197-2200.

9 van der Klein P.A.M., G.J.P.H. Boons, G.H. Veeneman, G.A. van der Marel, and J.H. van Boom. 1990. Iodonium ion promoted cyclization: A convenient approach to glycosyl donors of 3-deoxy-D-*manno*-2-octulosonic acid (KDO). *Synlett* (6): 311-313.

8 Noort, D., G.H. Veeneman, G.J.P.H. Boons, G.A. van der Marel, G.J. Mulder, and J.H. van Boom. 1990. Iodonium ion promoted reactions at the anomeric C-2 centre of 1-methylene sugars. *Synlett* (4): 205-206.

7 Boons, G.J.P.H., P.A.M. van der Klein, G.A. van der Marel, and J.H. van Boom. 1990. A practical route toward the preparation of 4,5:7,8-di-*O*-isopropylidene KDO ethyl ester. *Recl. Trav. Chim. Pays-Bas* **109**(4): 273-276.

6 van der Klein, P.A.M., G.J.P.H. Boons, G.H. Veeneman, G.A. van der Marel, and J. H. van Boom. 1989. An efficient route to 3-deoxy-D-*manno*-2-octulosonic acid (KDO) derivatives *via* a 1,4-cyclic sulfate approach. *Tetrahedron Lett.* **30**(40): 5477-5480.

5 Boons, G.J.P.H., M. Overhand, G.A. van der Marel, and J.H. van Boom. 1989. Application of the dimethyl(phenyl)silyl group as a masked form of the hydroxy group in the synthesis of an L-*glycero*-α-D-*manno*-heptopyranoside-containing trisaccharide from the dephosphorylated inner core region of *Neisseria meningitidis*. *Angew. Chem. Int. Ed.* **28**(11): 1504-1506.

4 Boons, G.J.P.H., M. Overhand, G.A. van der Marel, and J.H. van Boom. 1989. Synthesis of a trisaccharide of the inner core region of *Citrobacter PCM* 187 lipopolysaccharide that contains L-*glycero*-α-D-*manno*-heptopyranosyl units. *Carbohydr. Res.* **192**: c1-c4.

3 Boons, G.J.P.H., G.A. van der Marel, J.T. Poolman, and J.H. van Boom. 1989. Synthesis of L-*glycero*-α-D-*manno*-heptopyranose-containing disaccharide derivatives of the *Neisseria*

meningtitidis dephosphorylated inner-core region. *Recl. Trav. Chim. Pays-Bas* **108**(10): 339-343.

2 Boons, G.J.P.H., G.A. van der Marel, and J. H. van Boom. 1989. A versatile and new highly stereoselective approach to the synthesis of L-*glycero*-D-*manno*-heptopyranosides. *Tetrahedron Lett.* **30**(2): 229-232.

1 Boons, G.J.P.H., P.A.M. van der Klein, G.A. van der Marel, and J. H. van Boom. 1988. Synthesis of L-*glycero*-D-*manno*-heptose. *Recl. Trav. Chim. Pays-Bas* **107**(7-8): 507-508.

Contributions to Edited Work (in reverse chronological order)

19 Gagarinov, I.A., S. Visansirikul, A.D. Srivastava, and G.J. Boons. 2016. Simplifying access to 3,4-di-*O*-acetyl-D-fucal. In: *Carbohydrate Chemistry: Proven Synthetic Methods*, Volume 4 (C. Vogel and P. Murphy, eds). In press.

18 Gagarinov, I.A., Z. Wang, A.D. Srivastava, and G.J. Boons. 2016. A multigram synthesis of phenyl 2-azido-3-*O*-benzyl-2-deoxy-4,6-*O*-benzylidene-1-thio-*α*-D-mannopyranoside. In: *Carbohydrate Chemistry: Proven Synthetic Methods*, Volume 4 (C. Vogel and P. Murphy, eds). In press.

17 Boltje, T.J., L. Liu, and G.J. Boons. 2016. Controlling anomeric selectivity, reactivity, and regioselectivity in glycosylations using protecting groups. In: *Glycochemical Synthesis: Strategies and Applications* (S.-C. Hung and M.M.L. Zulueta, eds) Wiley, Inc., Chapter 4, pp. 97-129.

16 West, C.M., H. van der Wel, Z. Chinoy, G.J. Boons, T.J. Gauthier, C.M. Taylor, and Y. Xu. 2015. Generating isoform-specific antibodies: Lessons from nucleocytoplasmic glycoprotein Skp1. In: *Glycoscience: Biology and Medicine* (N. Taniguchi, T. End, G.W. Hart, P.H. Seeberger, C.-H. Wong, eds) Springer, Japan, pp. 927-934.

15 Boltje, T.J., R. Benedict, and G.J. Boons. 2014. Highly stereoselective 1,2-cis-glycosylations employing the C-2 (S)-(phenylthiomethyl)benzyl ether as a chiral auxiliary. In: *Carbohydrate Chemistry: Proven Synthetic Methods*, Volume 2 (G. van der Marel and J. Codee, eds) CRC Press, Taylor and Francis Group, pp. 3-8.

14 Friscourt, F. and G.J. Boons. 2013. Bioorthogonal reactions for labeling glycoconjugates. In: *Click Chemistry in Glycoscience: New Developments and Strategies* (Z.J. Witczak and R. Bielski, eds) John Wiley & Sons, Inc., pp. 211-233.

13 Boons, G.J. 2010. Bioorthogonal chemical reporter methodology for visualization, isolation and analysis of glycoconjugates. In: *Carbohydrate Chemistry: Chemical and Biological Approaches* **36** (A. Pilar Rauter and T.K. Lindhorst, eds) RSC Publishing, Cambridge, pp. 152-167.

12 Buskas, T., P. Thompson, and G.J. Boons. 2009. Semisynthetic and fully synthetic carbohydrate-based cancer vaccines. In: *Carbohydrate-Based Vaccines and Immunotherapies* (Z. Guo and G.J. Boons, eds) John Wiley & Sons, Inc., Hoboken, NJ, pp. 263-311.

11 Zhong, W. and G.J. Boons. 2008. Thioglycosides in oligosaccharide synthesis. In: *Handbook of Chemical Glycosylation: Advances in Stereoselectivity and Therapeutic Relevance* (A.V. Demchenko, ed.) Wiley-VCH, pp. 261-302.

10 Kim, J.H., H. Yang, and G.J. Boons. 2007. Stereoselective glycosylations using chiral auxiliaries. In: *Frontiers in Modern Carbohydrate Chemistry* (A.V. Demchenko, ed.) American Chemical Society, Washington DC, pp.73-90.

9 De Meo, C., G.J. Boons, and A.V. Demchenko. 2007. Synthesis of glycosides of sialic acid. In: *Comprehensive Glycoscience, Volume 1* (J.P. Kamerling, ed-in-chief, and G.J. Boons, Y.C. Lee, A. Suzuki, N. Taniguchi, and A.G.J. Voragen, eds.) Elsevier B.V., Amsterdam, pp. 583-604.

8 Boons, G.J. and B. Santhanam. 2003. Phathalic anhydride. In: *Encyclopedia of Reagents for Organic Synthesis*. John Wiley & Sons, Inc.

7 Boons, G.J. 2003. Sialic acid chemistry and biochemistry. In: *Carbohydrate-based Drug Discovery* (C.H. Wong, ed.) Wiley-VCH, pp. 55-102.
6 Boons, G.J. 2001. Glycosides as donors. In: *Glycoscience: Chemistry and Chemical Biology I-III.* (B. Fraser-Reid, J. Tatsuta, and J. Thiem, eds.) Springer-Verlag, Berlin Heidelberg, Volume I, pp. 551-581.
5 Boons, G.J. and T. Zhu. 2001. Two-direction glycosylations for the preparation of libraries of oligosaccharides. In: *Solid Support Oligosaccharide Synthesis and Combinatorial Carbohydrate Libraries* (P. Seeberger, ed.) John Wiley & Sons, Inc. Press, pp. 201-211.
4 Boons, G.J. and R. Polt. 1997. The synthesis of *N*- and *O*-linked glycopeptides. In: *Carbohydrate Chemistry* (G.J. Boons, ed.) Blackie Academic & Professional, pp. 223-242.
3 Boons, G.J. 1997. Strategies and tactics in oligosaccharide synthesis. In: *Carbohydrate Chemistry* (G.J. Boons, ed.) Blackie Academic & Professional, pp.175-222.
2 Boons, G.J. and B. Heskamp. 1997. Functionalised saccharides. In: *Carbohydrate Chemistry* (G.J. Boons, ed.) Blackie Academic & Professional, pp. 46-83.
1 Boons, G.J. 1997. Structure, configuration and conformation of mono- and oligosaccharides. In: *Carbohydrate Chemistry* (G.J. Boons, ed.) Blackie Academic & Professional, pp.1-20.

Authored Book

Boons, G.J. and K.J. Hale. 2000. *Organic Synthesis with Carbohydrates,* Sheffield Academic Press Ltd., Sheffield, UK; Blackwell Science, Inc., Malden, Massachusetts (Postgraduate Chemistry Series).

Edited Books

Carbohydrate Chemistry (G.J. Boons, ed.) 1997. Blackie Academic & Professional (Professional Reference Book).

Comprehensive Glycoscience, From Chemistry to Systems Biology (4 Volume Set) (J.P. Kamerling, ed-in-chief, and G.J. Boons, Y.C. Lee, A. Suzuki, N. Taniguchi, and A.G.J. Voragen, eds.) 2007. Elsevier B.V., Amsterdam, The Netherlands.

Carbohydrate-Based Vaccines and Immunotherapies (Z. Guo and G.J. Boons, eds.) 2009. John Wiley & Sons, Inc. (Wiley Series in Drug Discovery and Development).

Carbohydrate Recognition: Biological Problems, Methods, and Applications (B. Wang and G.J. Boons, eds.) 2011. John Wiley & Sons, Inc. (Wiley Series in Drug Discovery and Development).