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## CV

Dr. Martin Witte studied chemistry at Leiden University where he did his Master's thesis in the Bio-organic synthesis group of Prof. Jacques van Boom. He performed a research internship at Stanford University in the group of Prof. Matthew Bogoy before returning to Leiden University in 2004 to do his Ph.D. in the group of Prof. Gijsbert van der Marel and Prof. Herman Overkleef. He received his Ph.D. in 2009 and after a postdoctoral period in the same group, he joined the group of Prof. Hidde Ploegh at the Whitehead Institute for biomedical research as a postdoctoral fellow in 2010. He joined the Stratingh Institute as assistant professor in Chemical Biology on January 1st, 2013. His research interest focuses on the development of activity-based probes for previously untargeted enzymes (including sulfatases and sulfotransferases) and on the development of new protein labeling techniques

## Research output

### Site-Selective Modification of (Oligo)Saccharides

Witte, M. D. & Minnaard, A. J., 7-Oct-2022, In: ACS Catalysis. 12, 19, p. 12195-12205 11 p.

### Site-Selective Dehydroxy-Chlorination of Secondary Alcohols in Unprotected Glycosides

Zhang, J., Reintjens, N. R. M., Dhineshkumar, J., Witte, M. D. & Minnaard, A. J., 29-Jul-2022, In: Organic letters. 24, 29, p. 5339-5344 6 p.

### Palladium-Catalyzed Oxidation of Glucose in Glycopeptides

Reintjens, N. R. M., Yakovlieva, L., Marinus, N., Hekelaar, J., Nuti, F., Papini, A. M., Witte, M. D., Minnaard, A. J. & Walvoort, M. T. C., 7-Jul-2022, In: European Journal of Organic Chemistry. 2022, 25, 7 p., e202200677.

### Late-Stage Modification of Aminoglycoside Antibiotics Overcomes Bacterial Resistance Mediated by APH(3') Kinases

Bastian, A. A., Bastian, M., Jäger, M., Loznik, M., Warszawik, E. M., Yang, X., Tahiri, N., Fodran, P., Witte, M. D., Thoma, A., Köhler, J., Minnaard, A. J. & Herrmann, A., 27-Jun-2022, In: Chemistry. 28, 36, 7 p., e202200883.

### $\alpha$ -C-H Photoalkylation of a Glucose Derivative in Continuous Flow

Mouthaan, M. L. M. C., Pouwer, K., Borst, M. L. G., Witte, M. D. & Minnaard, A. J., 2022, In: Synthesis (Germany). 54, 21, p. 4683-4689 7 p.

### Rational design of a hydrolysis-resistant mycobacterial phosphoglycolipid antigen presented by CD1c to T cells

Reijneveld, J. F., Marino, L., Cao, T-P., Cheng, T-Y., Dam, D., Shahine, A., Witte, M. D., Filippov, D. V., Suliman, S., van der Marel, G. A., Moody, D. B., Minnaard, A. J., Rossjohn, J., Codée, J. D. C. & Van Rhijn, I., Oct-2021, In: Journal of Biological Chemistry. 297, 4, 101197.

### Biaryl sulfonamides as cisoid azosteres for photopharmacology

Kobauri, P., Szymanski, W., Cao, F., Thallmair, S., Marrink, S. J., Witte, M. D., Dekker, F. J. & Feringa, B. L., 27-Apr-2021, In: Chemical Communications. 57, 34, p. 4126-4129 4 p.

### Modular Approaches to Synthesize Activity- and Affinity-Based Chemical Probes

van der Zouwen, A. J. & Witte, M. D., 15-Apr-2021, In: Frontiers in Chemistry. 9, 17 p., 644811.

### **Iminoboronates as Dual-Purpose Linkers in Chemical Probe Development**

van der Zouwen, A. J. N., Jeucken, A., Steneker, R., Hohmann, K. F., Lohse, J., Slotboom, D. J. & Witte, M., 15-Feb-2021, In: *Chemistry*. 27, 10, p. 3292-3296 5 p.

### **On the Origin of Regioselectivity in Palladium-Catalyzed Oxidation of Glucosides**

Wan, I. C., Hamlin, T. A., Eisink, N. N. H. M., Marinus, N., de Boer, C., Vis, C. A., Codée, J. D. C., Witte, M. D., Minnaard, A. J. & Bickelhaupt, F. M., 26-Jan-2021, In: *European Journal of Organic Chemistry*. 2021, 4, p. 632-636 5 p.

### **Protein-Templated Hit Identification through an Ugi Four-Component Reaction\*\***

Mancini, F., Unver, M. Y., Elgaher, W. A. M., Jumde, V. R., Alhayek, A., Lukat, P., Herrmann, J., Witte, M. D., Köck, M., Blankenfeldt, W., Müller, R. & Hirsch, A. K. H., 17-Nov-2020, In: *Chemistry - A European Journal*. 26, 64, p. 14585-14593 9 p.

### **Turnip yellow mosaic virus protease binds ubiquitin suboptimally to fine-tune its deubiquitinase activity**

Fieulaine, S., Witte, M. D., Theile, C. S., Ayach, M., Ploegh, H. L., Jupin, I. & Bressanelli, S., 2-Oct-2020, In: *Journal of Biological Chemistry*. 295, 40, p. 13769-13783 15 p.

### **Stereoselective Protection-Free Modification of 3-Keto-saccharides**

Marinus, N., Tahiri, N., Duca, M., Mouthaan, L. M. C. M., Bianca, S., van den Noort, M., Poolman, B., Witte, M. D. & Minnaard, A. J., 17-Jul-2020, In: *Organic letters*. 22, 14, p. 5622-5626 5 p.

### **Total Synthesis of a Mycolic Acid from *Mycobacterium tuberculosis***

Tahiri, N., Fodran, P., Jayaraman, D., Buter, J., Witte, M. D., Ocampo, T. A., Moody, D. B., Van Rhijn, I. & Minnaard, A. J., 4-May-2020, In: *Angewandte Chemie (International ed. in English)*. 59, 19, p. 7555-7560 6 p.

### **Selective Modification of Streptozotocin at the C3 Position to Improve Its Bioactivity as Antibiotic and Reduce Its Cytotoxicity towards Insulin-Producing $\beta$ Cells**

Zhang, J., Yakovlieva, L., de Haan, B. J., de Vos, P., Minnaard, A. J., Witte, M. D. & Walvoort, M. T. C., Apr-2020, In: *Antibiotics*. 9, 4, 11 p., 182.

### **From d- to l-Monosaccharide Derivatives via Photodecarboxylation-Alkylation**

Wan, I. C. S., Witte, M. D. & Minnaard, A. J., 20-Sep-2019, In: *Organic letters*. 21, 18, p. 7669-7673 5 p.

### **Total Synthesis of an Immunogenic Trehalose Phospholipid from *Salmonella Typhi* and Elucidation of Its sn-Regiochemistry by Mass Spectrometry**

Mishra, V. K., Buter, J., Blevins, M. S., Witte, M. D., Van Rhijn, I., Moody, D. B., Brodbelt, J. S. & Minnaard, A. J., 5-Jul-2019, In: *Organic letters*. 21, 13, p. 5126-5131 6 p.

### **An in situ combinatorial methodology to synthesize and screen chemical probes**

van der Zouwen, A. J., Lohse, J., Wieske, L. H. E., Hohmann, K. F., van der Vlag, R. & Witte, M. D., 18-Feb-2019, In: *Chemical Communications*. 55, 14, p. 2050-2053 4 p.

### **Regioselective Manipulation of GlcNAc Provides Allosamine, Lividosamine, and Related Compounds**

Zhang, J., Eisink, N. N. H. M., Witte, M. D. & Minnaard, A. J., 18-Jan-2019, In: *Journal of Organic Chemistry*. 84, 2, p. 516-525 10 p.

### **Activity-Based Probes for Glycosidases: Profiling and Other Applications**

Kuo, C.-L., van Meel, E., Kytidou, K., Kallemeijn, W. W., Witte, M., Overkleeft, H. S., Artola, M. E. & Aerts, J. M., 2018, *CHEMICAL GLYCOBIOLOGY, PT B: MONITORING GLYCAN AND THEIR INTERACTIONS*. Imperiali, B. (ed.). Academic Press, Vol. 598. p. 217-235 19 p. (Methods in Enzymology; vol. 598).

### **Saccharide-Containing Dynamic Proteoids**

Liu, Y., Stuart, M. C. A., Witte, M. D., Buhler, E. & Hirsch, A. K. H., 16-Nov-2017, In: *Chemistry*. 23, 64, p. 16162-16166 5 p.

**Target and identify: triazene linker helps identify azidation sites of labelled proteins via click and cleave strategy**

Lohse, J., Schindl, A., Danda, N., Williams, C. P., Kramer, K., Kuster, B., Witte, M. D. & Médard, G., 11-Nov-2017, In: Chem. Commun.. 53, 87, p. 11929-11932 4 p.

**Stabilization of Glucocerebrosidase by Active Site Occupancy**

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**Site-selective carbon-carbon bond formation in unprotected monosaccharides using photoredox catalysis**

Wan, I. C. S., Witte, M. D. & Minnaard, A. J., 4-May-2017, In: Chemical Communications. 53, 36, p. 4926-4929 4 p.

**Targeted Diazotransfer Reagents Enable Selective Modification of Proteins with Azides**

Lohse, J., Swier, L. J. Y. M., Oudshoorn, R. C., Médard, G., Kuster, B., Slotboom, D. J. & Witte, M. D., Apr-2017, In: BIOCONJUGATE CHEMISTRY. 28, 4, p. 913-917 5 p.

**Investigations on therapeutic glucocerebrosidases through paired detection with fluorescent activity-based probes**

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Eisink, N. N. H. M., Witte, M. D. & Minnaard, A. J., Feb-2017, In: ACS Catalysis. 7, 2, p. 1438-1445 8 p.

**Bicyclic enol cyclocarbamates inhibit penicillin-binding proteins**

Dockerty, P., Edens, J. G., Tol, M. B., Morales Angeles, D., Domenech Pena, A., Liu, Y., Hirsch, A. K. H., Veening, J-W., Scheffers, D-J. & Witte, M. D., 3-Jan-2017, In: Organic & Biomolecular Chemistry. 15, 4, p. 894-910 17 p.

**A Protocol for Protein Profiling Using Chemoselective Cleavable Linker Probes in Semi-permeabilized Cells**

Claessen, J. H. L. & Witte, M. D., 2017, *Activity-Based Proteomics: Methods and Protocols*. Overkleeft, H. S. & Florea, B. I. (eds.). New York: Springer, Vol. 1491. p. 173-184 12 p. (Methods in Molecular Biology; vol. 1491).

**C3 Epimerization of Glucose, via Regioselective Oxidation and Reduction**

Jumde, V. R., Eisink, N. N. H. M., Witte, M. D. & Minnaard, A. J., 18-Nov-2016, In: Journal of Organic Chemistry. 81, 22, p. 11439-11443 5 p.

**Endo- $\beta$ -Glucosidase Tag Allows Dual Detection of Fusion Proteins by Fluorescent Mechanism-Based Probes and Activity Measurement**

Kallemeijn, W. W., Scheij, S., Voorn-Brouwer, T. M., Witte, M. D., Verhoek, M., Overkleeft, H. S., Boot, R. G. & Aerts, J. M. F. G., 15-Sep-2016, In: ChemBioChem. 17, 18, p. 1698-1704 7 p.

**Regioselective oxidation of unprotected 1,4 linked glucans**

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**Deuteration enhances catalyst lifetime in palladium-catalysed alcohol oxidation**

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#### **Site-specific protein modification using immobilized sortase in batch and continuous-flow systems**

Witte, M. D., Wu, T., Guimaraes, C. P., Theile, C. S., Blom, A. E. M., Ingram, J. R., Li, Z., Kundrat, L., Goldberg, S. D. & Ploegh, H. L., Mar-2015, In: *Nature protocols*. 10, 3, p. 508-516 9 p.

#### **Metabolic alkene labeling and in vitro detection of histone acylation via the aqueous oxidative Heck reaction**

Ourailidou, M. E., Dockerty, P., Witte, M., Poelarends, G. J. & Dekker, F. J., 12-Feb-2015, In: *Organic & Biomolecular Chemistry*. 13, 12, p. 3648-3653 6 p.

#### **A Sensitive Gel-based Method Combining Distinct Cyclophellitol-based Probes for the Identification of Acid/Base Residues in Human Retaining $\beta$ -Glucosidases**

Kallemijn, W. W., Witte, M. D., Voorn-Brouwer, T. M., Walvoort, M. T. C., Li, K-Y., Codee, J. D. C., van der Marel, G. A., Boot, R. G., Overkleeft, H. S. & Aerts, J. M. F. G., 19-Dec-2014, In: *The Journal of Biological Chemistry*. 289, 51, p. 35351-35362 12 p.

#### **Bispecific antibody generated with sortase and click chemistry has broad antiinfluenza virus activity**

Wagner, K., Kwakkenbos, M. J., Claassen, Y. B., Maijor, K., Bohne, M., van der Sluijs, K. F., Witte, M. D., van Zoelen, D. J., Cornelissen, L. A., Beaumont, T., Bakker, A. Q., Ploegh, H. L. & Spits, H., 25-Nov-2014, In: *Proceedings of the National Academy of Science of the United States of America*. 111, 47, p. 16820-16825 6 p.

#### **Exploring functional cyclophellitol analogues as human retaining beta-glucosidase inhibitors**

Li, K-Y., Jiang, J., Witte, M. D., Kallemijn, W. W., Donker-Koopman, W. E., Boot, R. G., Aerts, J. M. F. G., Codee, J. D. C., van der Marel, G. A. & Overkleeft, H. S., 21-Oct-2014, In: *Organic & Biomolecular Chemistry*. 12, 39, p. 7786-7791 6 p.

#### **Rational Design of Activity-Based Retaining $\beta$ -Exoglucosidase Probes**

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#### **Synthesis of Cyclophellitol, Cyclophellitol Aziridine, and Their Tagged Derivatives**

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#### **From covalent glycosidase inhibitors to activity-based glycosidase probes**

Willems, L. I., Jiang, J., Li, K-Y., Witte, M. D., Kallemijn, W. W., Beenakker, T. J. N., Schroeder, S. P., Aerts, J. M. F. G., van der Marel, G. A., Codee, J. D. C. & Overkleeft, H. S., 25-Aug-2014, In: *Chemistry*. 20, 35, p. 10864-10872 9 p.

#### **Rational Design of Activity-Based Retaining B-Exoglucosidase Probes**

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#### **Monovalent engagement of the BCR activates ovalbumin-specific transnuclear B cells**

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#### **Mechanism-based inhibitors of glycosidases: Design and applications**

Kallemijn, W. W., Witte, M. D., Wennekes, T. & Aerts, J. M. F. G., 2014, *Advances in Carbohydrate Chemistry and Biochemistry*. Horton, D. (ed.). SAN DIEGO: Academic Press, Vol. 71. p. 297-338 42 p. (*Advances in Carbohydrate Chemistry and Biochemistry*; vol. 71).

#### **Production of unnaturally linked chimeric proteins using a combination of sortase-catalyzed transpeptidation and click chemistry**

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**Bruton's Tyrosine Kinase (BTK) and Vav1 Contribute to Dectin1-Dependent Phagocytosis of *Candida albicans* in Macrophages**

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**Catch-and-Release Probes Applied to Semi-Intact Cells Reveal Ubiquitin-Specific Protease Expression in *Chlamydia trachomatis* Infection**

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**Preparation of unnatural N-to-N and C-to-C protein fusions**

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**Novel Activity-Based Probes for Broad-Spectrum Profiling of Retaining  $\beta$ -Exoglucosidases In Situ and In Vivo**

Kallemeijn, W. W., Li, K-Y., Witte, M. D., Marques, A. R. A., Aten, J., Scheij, S., Jiang, J., Willems, L. I., Voorn-Brouwer, T. M., Roomen, C. P. A. A. V., Ottenhoff, R., Boot, R. G., Elst, H. V. D., Walvoort, M. T. C., Florea, B. I., Codee, J. D. C., Marel, G. A. V. D., Aerts, J. M. F. G. & Overkleeft, H. S., 2012, In: Angewandte Chemie International Edition. 51, 50, p. 12529-12533 5 p.

**Synthesis of Eight 1-Deoxyjirimycin Isomers from a Single Chiral Cyanohydrin**

Nieuwendijk, A. M. C. H. V. D., Berg, R. J. B. H. N. V. D., Ruben, M., Witte, M. D., Brussee, J., Boot, R. G., Marel, G. A. V. D., Aerts, J. M. F. G. & Overkleeft, H. S., 2012, In: European Journal of Organic Chemistry. 2012, 18, p. 3437-3446 10 p.

**Tuning the leaving group in 2-deoxy-2-fluoroglucoside results in improved activity-based retaining beta-glucosidase probes**

Walvoort, M. T. C., Kallemeijn, W. W., Willems, L. I., Witte, M. D., Aerts, J. M. F. G., van der Marel, G. A., Codee, J. D. C. & Overkleeft, H. S., 2012, In: Chemical Communications. 48, 84, p. 10386-10388 3 p.

**Biomarkers in the diagnosis of lysosomal storage disorders: proteins, lipids, and inhibitors**

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**Activity-Based Profiling of Retaining beta-Glucosidases: A Comparative Study**

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**Irreversible inhibitors and activity-based probes as research tools in chemical glycobiology**

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#### **Ultrasensitive in situ visualization of active glucocerebrosidase molecules**

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#### **O-GlcNAc Peptide Epoxyketones Are Recognized by Mammalian Proteasomes**

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#### **Synthesis and Biological Evaluation of a Chitobiose-Based Peptide N-Glycanase Inhibitor Library**

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#### **Bodipy-VAD-Fmk, a useful tool to study yeast peptide N-glycanase activity**

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#### **Design of cell-permeable, fluorescent activity-based probes for the lysosomal cysteine protease asparaginyl endopeptidase (AEP)/legumain**

Sexton, K. B., Witte, M. D., Blum, G. & Bogyo, M., 2007, In: *Bioorganic & Medicinal Chemistry Letters*. 17, 3, p. 649-653 5 p.

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#### **Identification of Early Intermediates of Caspase Activation Using Selective Inhibitors and Activity-Based Probes**

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#### **NIS/TFA: a general method for hydrolyzing thioglycosides**

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