

Sascha Hoogendoorn, Ph.D.

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Education

- 2009–2014 Ph.D. in Chemistry (cum laude: highest honors), Leiden University, the Netherlands
Promotores: Prof. Dr. H. S. Overkleeft and Prof. Dr. G. A. van der Marel
- 2006–2008 M.Sc. in Chemistry (cum laude), Leiden University, the Netherlands
Advanced courses in chemistry, track "Design and Synthesis".
- 2004–2008 B.Sc. in Biopharmaceutical Sciences (cum laude), Leiden University, the Netherlands
Undergraduate courses in biopharmaceutical sciences.
- 2002–2007 B.Sc. in Chemistry (cum laude), Leiden University, Leiden, the Netherlands
Undergraduate courses in chemistry.

Employment

Tenure-Track Assistant Professor

- 2019–current Department of Organic Chemistry and NCCR Chemical Biology, University of Geneva, Switzerland

Postdoctoral Fellow

- 2013–2018 Chemical and Systems Biology, Stanford School of Medicine, California, USA
PI Prof. Dr. J. K. Chen
Description Development of genetic screening methodologies to study the Hedgehog signaling pathway.

Dissertation

- 2009–2014 Bio-organic Synthesis, Leiden University and Medical Biochemistry, AMC Amsterdam, the Netherlands
Title A chemical biology approach for targeting of ligand-drug conjugates
Supervisors Prof. Dr. G. A. van der Marel, Prof. Dr. H. S. Overkleeft (Leiden), Dr. R. Boot, Prof. Dr. J. M. F. G. Aerts (Amsterdam)
Description Design, synthesis and biological evaluation of ligand-fluorophore-biological effector conjugates for selective targeting of membrane receptors.

Teaching at UNIGE

- 2022–current Lecturer, Life Sciences PhD School, University of Geneva (2h/year)
- 2022–current Supervision of student research proposal, SPOC NCCR Chemical Biology (2h/year)
- 2020–current Lecturer, Target-Oriented Synthesis (14C024), MSc. Chemistry (4h/year)
- 2020–current Lecturer, General Chemistry II (11C002), 1st year BSc. Chemistry and Biochemistry (24h/year)
- 2019–current Supervision of three BSc Bibliography (Biology, Chemistry)
- 2019–current Lecturer, Current Topics in Chemical Biology (14CB01), MSc. Chemical Biology (4h/year)
- 2019–current Lecturer, Molecular genetics (CL2d87), 2nd year BSc. Biology and Biochemistry (2h/year)
- 2019–current Supervision of 2-3 students/year, Basic Techniques in Chemical Biology (14CB02 and 14CB03), MSc. Chemical Biology (1 week lab rotation)
- 2021–2022 Lecturer, Biochemistry and Biophysics of Membranes (14C001), MSc. Biochemistry (2h/year)
- 2019–2023 Responsible professor for the second and third-year teaching labs Organic

2019–2022 Chemistry (12C901 and 13C903), every afternoon from September to March
Supervision of an apprentice (Simon Unell)

Supervision of Junior Researchers at UNIGE

2020–current Supervision of 6 MSc thesis projects: Hyeonyi Choi, Esther Nagy, Christian Louis Guillod, Tomas Rodriguez Gil, Andrej Kovacevic, Rocaya Ali (international student)
2020–current Supervision of 4 postdocs: Florian Descamps, Deva Kusuluri, Aleksandar Salim, Silke Geurs
2019–current Supervision of 7 PhD students: Meropi Bagka, Charlotte Rossion, Ioannis Tsakoumagkos, Quentin Pasquer, Luis Hernandez, An Dieu Nguyen, Andrej Kovacevic

Memberships in Institutional Panels

2024–current President, Swiss Network for Interdisciplinary Education in Chemical Biology (SNE Chemical Biology)
2024–current Board member, Division of Medicinal Chemistry and Chemical Biology (DMCCB), Swiss Chemical Society
2024–current Chemical expert, International Non-proprietary Name (INN) program, World Health Organization
2023–current Scientific advisory board, Proteomics facility, Geneva
2021–current Scientific advisory board, ACCESS facility, Geneva
2022–2024 Treasurer, Swiss Network for Interdisciplinary Education in Chemical Biology (SNE Chemical Biology)
2021 Member of the recruitment committee for a Mass Spectrometry collaborator, NCCR Chemical Biology.

Active Memberships

Swiss Chemical Society, Société Académique de Genève.

Scientific Reviewing

Reviewer for ChemBioChem, ChemComm, BioEssays, ACS Chem. Biol., Curr. Op. Struct. Biol., Angewandte Chemie.
Member of the early career board of Helvetica Chimica Acta.

Outreach & Mentoring

- 2023 Participation in the *Women and Girls in Science and Technology* event, to promote gender diversity in STEM disciplines.
- 2022 Participation in the *Nuit des musées* Geneva, to present science to the general public.
- 2021–2022 ‘1 class, 1 scientist, 1 hour’. NCCR Chemical Biology Outreach Program. Participation by Charlotte Rossion.
- 2020–current Mentor, Swiss Women in Chemistry, Swiss Chemical Society

Organization of Conferences

- 2022 Organizing committee of the 2022 Chemical Biology Summer School, Swiss Chemical Society, Les Diablerets
- 2022 Organizing committee of the Organic Chemistry Division of the SCS Fall meeting
- 2021–2022 Organizing committee, SCS Spring meeting 2022, Geneva
- 2020–2022 Geneva host for NCCR Chemical Biology seminars (~1 seminar/ 2 months), Geneva
- 2019–2022 Coordinator of the weekly seminar series of the Department of Organic Chemistry, University of Geneva, Switzerland
- 2019–2020 Organizing committee, International Chemical Biology symposium 2020, NCCR Chemical Biology, Geneva
- 2019 Session Chair of Geneva Chemistry & Biochemistry Days 2019

Prizes, Awards, Fellowships

- 2015–2016 Seed grant, Stanford Center for Systems Biology, Stanford University, USA
- 2014–2016 Rubicon postdoctoral fellowship, NWO, the Netherlands
- 2011 Poster prize "Molecular Science", CHAINS conference, NWO, the Netherlands
- 2011 Travel award to attend the IPS meeting, Fellingafonds, KNCV, the Netherlands
- 2010 Poster prize, Organic Chemistry and Synthesis Study Group Meeting, NWO, the Netherlands
- 2008 Unilever research prize, for best master thesis in Chemistry, Unilever, the Netherlands

Project Funding

- 2024 ‘Modulation of ciliary signaling through targeted protein degradation’, Project grant; ‘International Co-investigator scheme’, SNSF, Switzerland
- 2023 ‘Cryo and Solid-State NMR Probes for the School of Chemistry and Biochemistry of the University of Geneva’, co-applicant, R’équip, SNSF, Switzerland
- 2023 Novartis Foundation for medical-biological Research
- 2022 Lab equipment grant, Société Académique de Genève
- 2021 Lab equipment grant, Fondation Schmidheiny
- 2021 ‘LIVEFLIMCHEM; Live and Automated Fluorescence Lifetime Microscopy of Cellular Processes with New Chemical Probes’, co-applicant, R’équip, SNSF, Switzerland
- 2020 Lab equipment grant, Fonds Givaudan
- 2020 Lab equipment grant, NCCR Chemical Biology
- 2020 ‘Destination cilium: towards selective probing and perturbation of ciliary signaling (DestCilia)’, ERC Starting Grant, European Research Council
- 2019 ‘Inhibitors of cilia and Hedgehog signaling: from phenotype to mechanistic understanding’, Project grant, SNSF, Switzerland
- 2019 ‘High-content screen for small-molecule modulators of Hedgehog signaling and ciliogenesis’, NCCR Chemical Biology, Switzerland

Invited Talks

- 2024 SJBCS2024, Kyoto, Japan
- 2024 SNE Chemical Biology Retreat
- 2023 Ghent University, Belgium
- 2023 30. Nachwuchswissenschaftler-Symposium Bioorganische Chemie, Munich, Germany
- 2023 EuChemS Division of Organic Chemistry - 14th Young Investigator Workshop (YIW2023), Leuven, Belgium.
- 2023 Annual Forum of the PhD School of Life Sciences, Geneva
- 2023 Department of Cell Physiology and Metabolism, CMU, Geneva
- 2023 Human Technopole, Italy
- 2023 Leiden Institute of Chemistry, The Netherlands.
- 2022 2022 Chemical Biology Summer School, Swiss Chemical Society, Les Diablerets
- 2022 Regio2022 Symposium, Liestal, Switzerland
- 2022 Société Chimique de Genève, University of Geneva
- 2021 PCC Christmas symposium, Basel University - virtual
- 2021 ChemBioChem virtual symposium
- 2021 EMBO Workshop 'Centrosomes and Spindle Pole Bodies', Denmark
- 2021 CRISPR and Beyond: Perturbations at Scale to Understand Genomes - virtual
- 2020 Panelist for EMBO Chemical Biology Workshop – Careers Fireside Chat, virtual
- 2019 Winter Retreat, NCCR Chemical Biology, Morges
- 2019 Seminar Series, Centre Intégratif de Genomique, University of Lausanne
- 2019 Young Faculty Meeting, SCNAT, Bern

Professional Development

- 2019 EMBO management course for group leaders, Villa Boninchi, Geneva

Career Breaks

- Nov 2023–Mar 2024 Maternity leave
- July–Oct 2015 Maternity leave
- May–Aug 2018 Maternity leave
- Oct–Dec 2018 Parental leave

Publications

* co-first author

(co)-corresponding author

1. Bagka, M., Choi, H., Heritier, M., Schwaemmle, H., Pasquer Q.T.L., Braun, S.G., Scapozza, L., Wu, Y., **Hoogendoorn, S.#** (2023). Targeted Protein Degradation Reveals BET Bromodomains as the Cellular Target of Hedgehog Pathway Inhibitor-1. *Nature Communications*, 14:3839. BioRxiv: <https://doi.org/10.1101/2022.08.16.504103>
2. Cadoux, C., Ratcliff, D., Maslac, N., Gu, W., Tsakoumagkos, I., **Hoogendoorn, S.**, Wagner, T., Milton, R. (2023). Nitrogen fixation and hydrogen evolution by sterically encumbered Mo-nitrogenase. *Journal of the American Chemical Society Au*. 3:1521 - 1533
3. Schuhmacher, M., **Hoogendoorn, S.#** (2023). Out With a Bang: Celebrating Global Chemical Biology. *ACS Chemical Biology*, 18:218-222. *Conference report*.
4. **Hoogendoorn, S.**, Winssinger, N., Matile, S. (2022). "SCS Spring Meeting 2022 on Biosupramolecular Chemistry, University of Geneva, Auditoire Marignac, April 22, 2022". *CHIMIA*, 76:604-606 *Conference report*.
5. Lopez-Andarias, J., Eblighatian, K., Pasquer, Q. T. L., Assies, L., Sakai, N., **Hoogendoorn, S.**, Matile, S. (2022). Photocleavable Fluorescent Membrane Tension Probes: Fast Release with Spatiotemporal Control in Inner Leaflets of Plasma Membrane, Nuclear Envelope, and Secretory Pathway. *Angewandte Chemie International Edition*, 61:e202113163.
6. Assies, L., García-Calvo, J., Piazzolla, F., Sanchez, S., Kato, T., Reymond, L., Goujon, A., Colom, A., López-Andarias, J., Straková, K., Mahecic, D., Mercier, V., Riggi, M., Jiménez-Rojo, N., Roffay, C., Licari, G., Tsemperouli, M., Neuhaus, F., Fürstenberg, A., Vauthey, E., **Hoogendoorn, S.**, Gonzalez-Gaitan, M., Zumbuehl, A., Sugihara, K., Gruenberg, J., Riezman, H., Loewith, R., Manley, S., Roux, A., Winssinger, N., Sakai, N., Pitsch, S., Matile, S. (2021). Flipper Probes for the Community. *CHIMIA*, 75:1004-1011.
7. Pasquer, Q. T. L., Tsakoumagkos, I. A., **Hoogendoorn, S.#** (2020). From Phenotypic Hit to Chemical Probe: Chemical Biology Approaches to Elucidate Small Molecule Action in Complex Biological Systems. *Molecules*, 25:5702. *Invited contribution for the special issue '25th Anniversary of Molecules – Recent Advances in Chemical Biology'. Review Article*.
8. **Hoogendoorn, S.#** (2020). Small Molecules Targeting the Hedgehog Pathway: From Phenotype to Mechanistic Understanding. *CHIMIA*, 74:652-658. *Invited contribution for the special issue 'News from New Chemistry Professors in Switzerland'*
9. **Hoogendoorn, S.#**, van Puijvelde, G. H. M., van der Marel, G. A., van Koppen, C. J., Timmers, C. M., Overkleeft, H. S.# (2020). Fluorescent Small-Molecule Agonists as Follicle-Stimulating Hormone Receptor Imaging Tools. *RSC Chemical Biology*, 1:263-272.
10. **Hoogendoorn, S.#**, Aye, Y.# (2020). Empowering Global Chemical Biology at the Dawn of the New Decade. *ACS Chemical Biology*, 15:1287-1291. *Conference report*.
11. Breslow, D. K. *, **Hoogendoorn, S.***, Kopp, A. R., Morgens, D. W., Vu, B. K., Kennedy, M. C., Han, K., Li, A., Hess, G. T., Bassik, M. C., Chen, J. K., Nachury, M. V. (2018). A CRISPR-based Screen for Hedgehog Signaling Provides Insights into Ciliary Function and Ciliopathies. *Nature Genetics*, 50:460-471. BioRxiv: <https://doi.org/10.1101/156059>
12. Kallemeijn, W. W., Scheij, S., **Hoogendoorn, S.**, Witte, M. D., Herrera Moro Chao, D., van Roomen, C. P. A. A., Ottenhoff, R., Overkleeft, H. S., Boot, R. G., Aerts, J. M. F. G. (2017). Investigations on Therapeutic Glucocerebrosidases through Paired Detection with Fluorescent Activity-based Probes. *PLoS ONE*, 12(2): e0170268.
13. de Bruin, G., Mock, E. D., **Hoogendoorn, S.**, van den Nieuwendijk, A. M. C. H., Mazurek, J., van der Marel, G. A., Florea, B. I., Overkleeft, H. S. (2016). Enantioselective Synthesis of Adamantylalanine and Carboranylalanine and their Incorporation into the Proteasome Inhibitor Bortezomib. *Chemical Communications*, 52:4064-4067.
14. See, S. K., **Hoogendoorn, S.**, Chung, A. H., Ye, F., Steinman, J. B., Sakata-Kato, T., Miller, R. M., Cupido, T., Zalyte, R., Carter, A. P., Nachury, M. V., Kapoor, T. M., Chen, J. K. (2016). Cytoplasmic

- Dynein Antagonists with Improved Potency and Isoform Selectivity. *ACS Chemical Biology*, 11:53–60.
15. van den Berg, R. J. B. H. N., van Rijssel, E. R., Ferraz, M. J., Houben, J., Strijland, A., Donker-Koopman, W. E., Wennekes, T., Bongers, K. M., Ghisaidoobe, A. B. T., **Hoogendoorn, S.**, van der Marel, G. A., Codée, J. D. C., Overkleeft, H. S., Aerts, J. M. F. G. (2015). Synthesis and Evaluation of Hybrid Structures Composed of Two Glucosylceramide Synthase Inhibitors. *ChemMedChem*, 12:2042-2062
 16. **Hoogendoorn, S.***, Mock, E. D.* , Strijland, A., Donker-Koopman, W. E., van den Elst, H., van den Berg, R. J. B. H. N., Aerts, J. M. F. G., van der Marel, G. A., Overkleeft, H. S. (2015). Ortho-Carborane-Modified *N*-Substituted Deoxynojirimycins. *European Journal of Organic Chemistry* 20:4437-4446.
 17. Wong, C.-S.* , **Hoogendoorn, S.***, van der Marel, G. A., Overkleeft, H. S., Codée, J. C. (2015). Targeted Delivery of Fluorescent High-Mannose-Type Oligosaccharide Cathepsin Inhibitor Conjugates. *ChemPlusChem*, 80:928-937.
 18. Liu, N., **Hoogendoorn, S.**, van de Kar, B., Kaptein, A., Barf, T., Driessen, C., Filippov, D. V., van der Marel, G. A., van der Stelt, M., Overkleeft, H. S. (2015). Direct and Two-step Bioorthogonal Probes for Bruton's Tyrosine Kinase Based on Ibrutinib: a Comparative Study. *Organic & Biomolecular Chemistry*, 13:5147-5157.
 19. **Hoogendoorn, S.**, van Puijvelde, G. H. M., Kuiper, J., van der Marel, G. A., Overkleeft, H. S. (2014). A Multivalent Ligand for the Mannose-6-Phosphate Receptor for Endolysosomal Targeting of an Activity-Based Probe. *Angewandte Chemie International Edition*, 53: 10975-10978.
 20. Li, K.-Y., Jiang, J., Witte, M. D., Kallemeijn, W. W., van den Elst, H., Wong, C.-S., Chander, S. D., **Hoogendoorn, S.**, Beenakker, T. J. M., Codée, J. D. C., Aerts, J. M. F. G., van der Marel, G. A., Overkleeft, H. S. (2014). Synthesis of Cyclophellitol, Cyclophellitol Aziridine, and Their Tagged Derivatives. *European Journal of Organic Chemistry*, 27: 6030-6043.
 21. Baggelaar, M. P., Janssen, F. J., van Esbroeck, A. C. M., den Dulk, H., Allara, M., **Hoogendoorn, S.**, McGuire, R., Florea, B., Meeuwenoord, N., van den Elst, H., Visser, L., van der Marel, G. A., Brouwer, J., Doherty, P., Di Marzo, V., Overkleeft, H. S., van der Stelt, M. (2013). Identification of Novel DAG-lipase- α Inhibitors with Unprecedented Selectivity in Brain Using Comparative ABPP and In Silico Design. *Angewandte Chemie International Edition*, 52: 12081-12085.
 22. Van der Linden, W. A., Li, N., **Hoogendoorn, S.**, Ruben, M., Verdoes, M., Guo, J., Boons, G.-J., van der Marel, G. A., Florea, B. I., Overkleeft, H. S. (2012). Two-step Bioorthogonal Activity-based Proteasome Profiling Using Copper-free Click Reagents: a Comparative Study. *Bioorganic & Medicinal Chemistry*, 20:662-666.
 23. Willems, L.I., van der Linden, W. A., Li, N., Li, K.-Y., Liu, N., **Hoogendoorn, S.**, van der Marel, G. A., Florea, B. I., Overkleeft, H. S. (2011). Bioorthogonal Chemistry: Applications in Activity-based Protein Profiling. *Accounts of Chemical Research*, 44: 718-729. *Review*.
 24. **Hoogendoorn, S.**, Willems, L., Florea, B., Overkleeft, H. Hypersensitive Response to Over-reactive Cysteines. (2011). *Angewandte Chemie International Edition*, 50: 5434-5436. *Highlight*.
 25. **Hoogendoorn, S.**, Blom A. E. M., Willems, L. I., van der Marel, G. A., Overkleeft, H. S. (2011). Synthesis of pH-Activatable Red Fluorescent BODIPY Dyes with Distinct Functionalities. *Organic Letters*, 13: 5656-5659.
 26. **Hoogendoorn, S.**, Habets, K. L., Passemard, S., Kuiper, J., van der Marel, G. A., Florea, B. I., Overkleeft, H. S. (2011). Targeted pH-Dependent Fluorescent Activity-based Cathepsin Probes. *Chemical Communications*, 47: 9363-9365.
 27. Bongers, K. M.* , **Hoogendoorn, S.***, van Koppen, C. J., Timmers, C. M., van der Marel, G. A., Overkleeft, H. S. (2011). Development of Selective LH Receptor Agonists by Heterodimerization with a FSH Receptor Antagonist. *ACS Medicinal Chemistry Letters*, 2: 85-89.
 28. Van Delft, P., Meeuwenoord, N. J., **Hoogendoorn, S.**, Dinkelaar, J., Overkleeft, H. S., van der Marel, G. A., Filippov, D. V. (2010). Synthesis of Oligoribonucleic Acid Conjugates Using a Cyclooctyne Phosphoramidite. *Organic Letters*, 12:5486-5489.
 29. Bongers, K. M.* , **Hoogendoorn, S.***, van Koppen, C. J., Timmers, C. M., Overkleeft, H. S., van der

- Marel, G. A. (2009). Synthesis and Pharmacological Evaluation of Dimeric Follicle-Stimulating Hormone Receptor Antagonists. *ChemMedChem*, 4:2098-2102.
30. Gomes, I., Grushko, J. S., Golebiewska, U., **Hoogendoorn, S.**, Gupta, A., Heimann, A. S., Ferro, E. S., Scarlata, S., Fricker, L. D., Devi, L. A. (2009). Novel Endogenous Peptide Agonists of Cannabinoid Receptors. *FASEB Journal*, 23:3020.