Gino Occhialini

Postdoctoral Scholar · California Institute of Technology
gino@caltech.edu | Gino Occhialini

Education

Massachusetts Institute of Technology (MIT) — *Cambridge, MA*
Ph.D. Chemistry (GPA: 5.00/5.00) — *Aug. 2018 - Sept. 2024*
Advisor: Alison Wendlandt
NSF Graduate Research Fellow

University of Texas at Dallas (UTD) — *Richardson, TX*
B.S. Chemistry (GPA: 4.00/4.00) — *Aug. 2014 - May 2018*
Graduation Honors: Major Honors with Distinction, Summa Cum Laude

Research Experience

Postdoctoral Scholar — *Pasadena, CA*
Reisman Lab, Division of Chemistry and Chemical Engineering , Caltech — *Jan. 2025 - Present*
Development of new synthetic methods for the construction of complex molecules

Research Assistant — *Cambridge, MA*
Wendlandt Lab, Department of Chemistry, MIT — *Aug. 2018 - Sept. 2024*
Development of light-driven stereo- and positional editing tools
- Internal to terminal positional olefins isomerization
- Pyranoside stereoediting methodology + mechanistic studies
- Terminal-selective, acceptorless dehydrogenation
- Whole-reaction kinetic modeling, network dynamics + complex reaction profiles (with Dr. Eugene Kwan, Merck)
- Time-resolved spectroscopy of decatungstate-catalyzed reactions (with Prof. Gabriela Schlau-Cohen, MIT)

Heterocycle-specific C—H functionalization of pyridazines (with Bristol Myers Squibb)

Undergraduate Research Assistant — *Richardson, TX*
Smaldone Lab, Department of Chemistry, UT Dallas — *July 2015 - Aug. 2018*
Synthesis and characterization of novel covalent organic frameworks
- Understanding the role of monomer electronics and planarity on COF formation
- Novel COF topologies to enhance gas adsorption properties

Summer Undergraduate Research Fellow — *Dallas, TX*
Siegwart Lab, Simmons Cancer Center, UT Southwestern — *Summer 2016*
Synthesis and characterization of turn-on fluorescent probes for cancer diagnosis and imaging.

Teaching Experience

Massachusetts Institute of Technology — *Cambridge, MA*
Teaching Assistant - Organic Chemistry I (5.12) — *Aug. 2018 - May 2019*
Head teaching assistant (Spring 2019) for team of 9 graduate student TAs
Outstanding Teaching Award (2019)

University of Texas at Dallas — *Richardson, TX*
Teaching Assistant - Honors Organic Chemistry I & II (CHEM2327, CHEM2328) — *Aug. 2015 - May. 2018*
Outstanding Undergraduate TA Award (2018)

Teaching Assistant - Anatomy & Physiology I (BIOL3455) — *Jan. 2016 - Dec. 2016*

Teaching Assistant - Biochemistry I (BIOL3361) — *Aug. 2015 - May. 2016*

Peer-Reviewed Publications

† indicates equal contribution

Occhialini, G.; Wendlandt, A. E. Kinetics, thermodynamics, and emergence in stereoediting reactions, *Invited review, In preparation.*

Occhialini, G.†; Moulton. K.†; Wendlandt, A. β-glucosylation to access β-mannosides, *In preparation.*

Zhang, R.†; **Occhialini, G.†**; Zhang, J.; Barbour, J.; Scola, P.; Ramirez, A.; Wendlandt, A. E. Heterocycle-specific C-H alkylation of pyridazine, *In preparation.*

Gorelik, D.†; Gong, G.†; **Occhialini, G.**; Barbour, J.; Gu, X.; Wendlandt, A. E. Acceptorless dehydrogenation for the expedient synthesis of highly functionalized phenols and arenes. *In preparation.*

Zhang, S.; **Occhialini, G.**; Carder, H. M.; de Kleijne, F. F. J.; Wendlandt, A. E. Steady state tuning under kinetic network control: selective epimerization of GlcNAc to GalNAc. *Under Evaluation—Nature Chem.*

Carder, H. M.†; **Occhialini, G.†**; Bistoni, G.; Riplinger, C.; Kwan, E. E.; Wendlandt, A. E. The sugar cube: Network control and emergence in stereoediting reactions. *Science* **2024**, *385*, 456—463.

Gu, X.†; Zhang, Y.-A.†; Wang, L.; Ye, X.; **Occhialini, G.**; Barbour, J.; Pentelute, B. L.; Wendlandt, A. E. Synthesis of Non-Canonical Amino Acids through Dehydrogenative Tailoring. *Nature* **2024**, *634*, 456—463.

Occhialini, G.; Palani, V.; Wendlandt, A. E. Catalytic, contra-thermodynamic positional alkene isomerization. *J. Am. Chem. Soc.* **2022**, 144, 145—152.

Thompson, C. M. †; **Occhialini, G.†**; McCandless, G. T.; Alahakoon, S. B.; Cameron, V.; Nielsen, S. O.; Smaldone, R. A. Computational and Experimental Studies on the Effects of Monomer Planarity on Covalent Organic Framework Formation. *J. Am. Chem. Soc.* **2017**, 139, 10506—10513.

Alahakoon, S. B.†; **Occhialini, G.†**; McCandless, G. T.; Karunathilake, A. A. K.; Nielsen, S. O.; Smaldone, R. A. Experimental and theoretical insight into the effect of fluorine substituents on the properties of azine linked covalent organic frameworks. *CrystEngComm* **2017**, 19, 4882—4885.

Xiong, H.; Zuo, H.; Yan, Y.; **Occhialini, G.**; Zhou, K.; Wan, Y.; Siegwart, D. J. High-contrast fluorescence detection of metastatic breast cancer including bone and liver micrometastases via size-controlled pH-activatable water-soluble probes. *Adv. Mat.* **2017**, 29, 1700131.

Alahakoon, S. B.; Thompson, C. M.; **Occhialini, G.**; Smaldone, R. A. Design principles for covalent organic frameworks in energy storage applications. *ChemSusChem* **2017**, 10, 2116—2129

Alahakoon, S. B.; Thompson, C. M.; Nguyen, A. X.; **Occhialini, G.**; McCandless, G. T.; Smaldone, R. A. An azine-linked hexaphenylbenzene based covalent organic framework. *Chem. Comm.* **2016**, *52*, 2843—2845

Honors & Fellowships

2024 **Leadership Award**, MIT Chemistry
2024 **Chemistry Fellowship**, MIT Chemistry
2020 **National Science Foundation Graduate Research Fellow**, NSF
2020 **Strem Family Fellowship**, MIT Chemistry
2019 **Outstanding Teaching Award**, MIT Chemistry
2019 **Kenneth M. Gordon Fellowship**, MIT Chemistry
2018 **John P. Ferraris Research Excellence Award**, UT Dallas Cehmistry
2018 **Hertz Fellowship Semifinalist**, Hertz Foundation
2018 **Patty Henry Pinch Scholarship**, UT Dallas
2018 **Outstanding Undergraduate TA**, UT Dallas School of Natural Sciences and Mathematics
2017 **Goldwater Scholarship**, Goldwater Foundation
2017 **Outstanding Undergraduate Student**, ACS, DFW Chapter
2017 **Cyrus Cantrell III Grant**, UT Dallas Phi Kappa Phi

2016 **Undergraduate Resarch Scholar Award**, UT Dallas
2014 **Academic Excellence Scholarship**, UT Dallas
2014 **Collegium V Honors Program**, UT Dallas

Skills

Safety	safe handling of pyrophoric, reactive, and toxic reagents
Synthesis	organic and organometallic synthesis, moisture and air sensitive reactions
Mechanism	chemical kinetics, calorimetry, reactIR, isotope effects, linear free energy studies
Purification	normal and reverse phase purification (column and preparative HPLC)
Spectroscopy	NMR, MassSpec, FTIR, HPLC, transient absorption, UV-Vis, polarimetry, X-ray crystalography
Computation	density functional theory, transition state theory, molecular dynamics
Programming	python, julia, bash, linux operating system, high-performance computing, web design