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John C. Janetzko, Ph.D.

Education & Training

Stanford University: Department of Molecular & Cellular Physiology, from 12/2022
Instructor in Molecular & Cellular Physiology

Stanford University: Department of Molecular & Cellular Physiology, 09/2017 – 11/2022
Damon Runyon & NIGMS postdoctoral fellow with Brian K. Kobilka

Harvard Medical School: Department of Microbiology and Immunobiology, 06/2017 – 08/2017
Postdoctoral fellow with Suzanne Walker

Harvard University: Ph.D. in Chemistry, 07/2011 – 05/2017
Graduate student with Suzanne Walker and Daniel Kahne

University of Toronto: Honours B.Sc. in Chemistry with *high distinction*, 09/2007 – 05/2011

Selected Honours & Awards

2022–2027	National Institutes of Health (NIH): National Institute of General Medical Science (NIGMS) K99/R00 Pathway to Independence Award, Stanford.
2018–2022	Damon Runyon Cancer Research Foundation Postdoctoral Fellowship, Stanford.
2018	American Heart Association Postdoctoral Fellowship *declined*.
2018	Stanford School of Medicine Dean's Postdoctoral Fellowship, Stanford.
2016	Christensen Travel Prize for Outstanding Research Achievement, Harvard.
2013	Derek Bok Center Certificate of Distinction in Teaching, Harvard. Awarded based on an overall teaching evaluation score of 4.50/5 or better.
2013–2016	Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship PGS-D3, Harvard.
2012	Derek Bok Center Certificate of Distinction in Teaching, Harvard.
2012–2013	NSERC Postgraduate Scholarship PGS-M, Harvard.
2011	Harold Willett Stewart Memorial Scholarship, UofT.
2011	The University of Toronto Chemistry Club Prize in Chemistry, UofT. Awarded to the student with the best senior thesis.
2010	The Sarah C. Gollop and William G. Gollop Memorial Scholarship in Chemistry, UofT.
2010	The Ivan Szak Scholarship in Chemistry, UofT.
2010	The David McLaren Scholarship in Chemistry, UofT.
2010	The Canadian Society for Chemistry Silver Academic Medal, UofT. Awarded to the student with the highest standing in a chemistry specialist program.
2007	Member of Canadian International Chemistry Olympiad (IChO) Team. One of four Canadian students selected to represent Canada at the 39^{th} IChO, Moscow, RU.

Research Experience

Stanford University: Postdoctoral fellow with Brian K. Kobilka, 09/2017 – Present

Major research accomplishments: Part of a team that obtained a molecular structure of the Neurotensin type 1 receptor (NTSR1) in complex with β-arrestin 1 by single particle cryo-electron microscopy (cryo-EM). Established a mechanistic basis for phosphoinositide regulation of β-arrestin function. Used single-molecule FRET spectroscopy to investigate the mechanism of β-arrestin activation, and GPCR-β-arrestin complex dynamics.
Ongoing collaborative work: use of intact and native mass spectrometry to investigate GPCR post-translational modifications (with Neil Kelleher, Northwestern U); Use of atomic force microscopy to investigate GPCR-β-arrestin interactions (with Daniel Müller, ETH Zurich).
Relevant skills: bulk and single-molecule fluorescence spectroscopy; cryo-EM and model building; proteomics; membrane protein biochemistry; cellular assays; pharmacology; data visualization in R.

Harvard University: Graduate student with Suzanne Walker and Daniel Kahne, 01/2012 – 05/2017
Thesis: "OGT catalyzes three distinct post-translational modifications via glycosylation"
Thesis Committee: Stuart L. Schreiber, Timothy J. Mitchison

Major research accomplishments: Determined the mechanism for proteolysis of host-cell factor 1 by the glycosyltransferase OGT. Part of a team that developed cell-permeable OGT inhibitors for interrogating OGT biology.
Relevant Skills: mass spectrometry; enzyme kinetics; macromolecular crystallography; protein biochemistry; molecular biology; small-molecule probe development; assay development; reaction mechanisms.

University of Toronto: Research assistant with Robert A. Batey, 05/2008 – 05/2011

Major research accomplishments: Planned and executed the total synthesis of (+)-Antimycin A_{1b}; developed a chemo- and diastereoselective method for allylation of α,β-epoxyketones.
Relevant Skills: chemical synthesis.

University of Toronto: Research assistant with Datong Song, 10/2007 – 04/2008

Major research accomplishments: Synthesized multinuclear palladium β-diiminate complexes and explored their reactivity.
Relevant Skills: organometallic synthesis; small-molecule crystallography.

Publications

14. **John Janetzko**, Ryoji Kise, Benjamin Barsi-Rhyne, Dirk H. Siepe, Franziska M. Heydenreich, Kouki Kawakami, Matthieu Masureel, Shoji Maeda, K. Christopher Garcia, Mark zon Zastrow, Asuka Inoue and Brian K. Kobilka "Membrane phosphoinositides stabilize GPCR-β-arrestin complexes and provide temporal control of complex assembly and dynamics", ***Cell***, Accepted.
    - Pre-print available on ***BioRxiv***. Posted October 10, 2021; Updated February 3, 2022.

13. Cassandra M. Joiner, Forrest A. Hammel, **John Janetzko** and Suzanne Walker "Protein Substrates Engage the Lumen of *O*-GlcNAc Transferase's Tetratricopeptide Repeat Domain in Different Ways", ***Biochemistry***, 2021, 60 (11), 847–853. Link to paper.

12. Weijiao Huang*, Matthieu Masureel*, Qianhui Qu*, **John Janetzko***, Asuka Inoue, Hideaki E. Kato, Michael J.Robertson, Khanh C. Nguyen, Jeffrey S. Glenn, Georgios Skiniotis and Brian K. Kobilka "Structure of the neurotensin receptor 1 in complex with β-arrestin 1", ***Nature***, 2020, 579, 303–308 **(*co-first author)**. Link to paper.
    - Previewed in: *Cell*, 2020, 180 (6), 1041–1043.
    - Highlighted by Faculty Opinions.

11. Sara E.S. Martin*, Zhi-Wei Tan*, Harri M. Itkonen, Damien Y. Duveau, Joao A. Paulo, **John Janetzko**, Paul L. Boutz, Lisa Törk, Frederick A. Moss, , Craig J. Thomas, Steven P. Gygi, Michael B. Lazarus and Suzanne Walker "Structure-Based Evolution of Low Nanomolar-*O*-GlcNAc Transferase Inhibitors", ***Journal of the American Chemical Society***, 2018, 140 (42), 13542–13545 (*co-first author). Link to paper.

10. **John Janetzko** and Suzanne Walker "Aspartate Glycosylation Triggers Isomerization to Isoaspartate", ***Journal of the American Chemical Society***, 2017, 139 (9), 3332–3335. Link to paper.

9. **John Janetzko**, Sunia A. Trauger, Michael B. Lazarus and Suzanne Walker "How the glycosyltransferase OGT catalyzes amide bond cleavage", ***Nature Chemical Biology***, 2016, 12 (11), 899–901. Link to paper.
   - Highlighted in News & Views: *Nat. Chem. Biol.*, 2016, 12 (11), 892–893.
   - Highlighted by Faculty Opinions.

8. Jordan D. Goodreid, **John Janetzko**, John P. Santa Maria Jr., Keith S. Wong, Elisa, Leung, Bryan T. Eger, Steve Bryson, Emil F. Pai, Scott D. Gray-Owen, Suzanne Walker, Walid A. Houry and Robert A. Batey "Development and Characterization of Potent Cyclic Acyldepsipeptide Analogues with Increased Antimicrobial Activity", ***Journal of Medicinal Chemistry***, 2016, 59 (2), 624–646. Link to paper.

7. Rodrigo F. Ortiz-Meoz, Jiaoyang Jiang, Michael B. Lazarus, Marina Orman, **John Janetzko**, Chenguang Fan, Damien Y. Duveau, Zhi-Wei Tan, Craig J. Thomas and Suzanne Walker "A Small Molecule That Inhibits OGT Activity in Cells", ***ACS Chemical Biology***, 2015, 10 (6), 1392–1397. Link to paper.

6. **John Janetzko** and Suzanne Walker "The Making of a Sweet Modification: Structure and Function of *O*-GlcNAc Transferase", ***Journal of Biological Chemistry***, 2014, 289 (50), 34424–34432. [Review] Link to paper.

5. **John Janetzko** and Robert A. Batey "Organoboron-Based Allylation Approach to the Total Synthesis of the Medium-Ring Dilactone (+)-Antimycin A_{1b}", ***Journal of Organic Chemistry***, 2014, 79 (16), 7415–7425. Link to paper.

4. Michael B. Lazarus*, Jiaoyang Jiang*, Vaibhav Kapuria, Tanja Bhuiyan, **John Janetzko**, Wesley F. Zandberg, David J. Vocadlo, Winship Herr and Suzanne Walker "HCF-1 is cleaved in the active site of *O*-GlcNAc transferase", ***Science***, 2013, 342 (6163), 1235–1239 (*co-first author). Link to paper.

3. Vincent T. Annibale, Runyu Tan, **John Janetzko**, Liisa M. Lund, and Datong Song "Palladium β-Diiminate Chemistry: Reactivity Towards Monodentate Ligands and Arylboronic Acids", ***Inorganica Chimica Acta***, 2012, 380, 308–321. Link to paper.

2. Farhad Nowrouzi, **John Janetzko** and Robert A. Batey "Indium-promoted chemo- and diastereoselective allylation of α,β-epoxyketones with potassium allyltrifluoroborate", ***Organic Letters***, 2010, 12 (23), 5490–5493. Link to paper.

1. Alen Hadzovic, **John Janetzko** and Datong Song "Novel Dinuclear and Trinuclear Palladium β-Diiminate Complexes Containing Amido-Chloro Double-Bridges", ***Dalton Transactions***, 2008, 3279–3281. Link to paper.

Teaching

Harvard College

Teaching Fellow (Discussion Section Leader), Organic Chemistry I (Chem 20), Spring 2013

Non-resident science tutor, Winthrop House, 2012 – 2015

Teaching Fellow (Discussion Section Leader), Organic Chemistry I (Chem 20), Spring 2012

Research Mentorship

In the Kahne & Walker labs I supervised one rotation student and trained one post-doctoral fellow. In the Kobilka lab I helped train one MD-PhD student and one visiting graduate student.

Canadian Chemistry Olympiad

From 2008 – 2015 I served in various roles, including: student mentor, laboratory instructor, lecturer, and national & provincial exam contributor. I was involved in international team selection and pre-international training camps from 2010 – 2015.

Canadian IChO team head mentor – 46th IChO, Há Nộ̣i, Vietnam, July 2014

Canadian IChO team mentor – 43rd IChO, Ankara, Turkey, July 2011

Invited Talks

11. FASEB G Protein-coupled Receptor Kinases and Arrestins Conference, Jupiter, FL, August 2022.
10. University of Birmingham (UK) Centre of Membrane Proteins and Receptors (COMPARE) seminar series, (via *Zoom*), July 2022.
9. American Society for Biochemistry and Molecular Biology (ASBMB) Annual Meeting, "Lipids Interest Group – Novel insight into roles of lipids in signaling and human disease", Philadelphia, PA, April 2022.
8. Montana Molecular, (via *Zoom*), March 2022.
7. Octant Bio, Emeryville, CA, November 2021.
6. Medical College of Wisconsin "Future Stars in Cryo-EM" (via *Zoom*), June 2021.
5. ASBMB Lipid Research Division: session on "Lipids in transmembrane protein structure" (via *Zoom*), June 2020.
4. University of Toronto Dept. Chemistry & Dept. Chemical and Physical Sciences (UTM), October 2019.
3. Discovery on Target, session on GPCR-based drug discovery, Boston, MA, September 2019.
2. Relay Therapeutics, Boston, MA, September 2019.
1. Gordon Research Seminar: Enzymes, Coenzymes & Metabolic Pathways, Waterville Valley, NH. July 2017.

Selected Scientific Presentations

14. Poster Presentation @ 2022 Keystone symposium on GPCRs, Snowbird, UT. April 2022.
13. Poster Presentation & Spotlight Oral Presentation @ 2022 ASBMB Annual Meeting, Philadelphia, PA. April 2022.
12. Poster Presentation @ 2022 Biophysical Society Annual Meeting, San Francisco, CA. February 2022.
11. Poster Presentation @ 2021 Transatlantic GPCR Symposium, via *Zoom*. July 2021.
10. Poster Presentation & Flash Oral Presentation @ 2019 GPCR Workshop, Kailua-Kona, HI. December 2019.
9. Poster Presentation @ Gordon Research Conference: Enzymes, Coenzymes & Metabolic Pathways, Waterville Valley, NH. July 2017. **Poster award**.
8. Oral Presentation @ 99th Canadian Chemistry Conference and Exhibition, Halifax, NS, Canada. June 2016. **Presentation award**.

7. Poster Presentation @ Gordon Research Conference: Enzymes, Coenzymes & Metabolic Pathways, Waterville Valley, NH. July 2015.
6. Poster Presentation @ 42nd National Organic Symposium, Princeton University. June 2011.
5. Poster Presentation @ ORCHEM 2010, Weimar, Germany. September 2010.
4. Oral Presentation @ 39th Southern Ontario Undergraduate Student Chemistry Conference, University of Waterloo. March 2011. **Presentation award**.
3. Oral Presentation @ 93rd Canadian Chemistry Conference and Exhibition, Toronto, ON, Canada. May 2010.
2. Poster Presentation @ 41st National Organic Symposium, University of Colorado, Boulder. June 2009.
1. Poster Presentation @ 92nd Canadian Chemistry Conference and Exhibition, Hamilton, ON, Canada. May 2009. **Poster award**.

Active Professional Societies

Member, American Society for Biochemistry and Molecular Biology (ASBMB), 2021–Present.

Member, European Research Network on Signal Transduction (ERNEST), 2021–Present.

Member, Biophysical Society (BPS), 2021–Present.

Member, USHUPO, 2020–Present.

Service & Leadership

Science

Ad Hoc Reviewer, since 2011 *Journal of the American Chemical Society*, *ACS Chemical Biology*, *Biochemistry*, *Scientific Reports*, *Nature Chemical Biology*, *Medicinal Research Reviews*, *eLife*, *Science Signaling*.

Spring 2022 guest career speaker @ Strathcona-Tweedsmuir School (Calgary, AB, Canada).

ASPET poster competition judge @ 2022 ASBMB meeting.

Guest blogger/media @ 2022 BPS meeting.

Co-organizer of 2022 Transatlantic Early-career Investigator GPCR Symposium.

Stanford MCP ad hoc member of department committee on DEI initiatives – summer 2020

Associate "Faculty" member (contributor), Faculty Opinions 2015–2020.

Harvard Chemistry Graduate Student & Postdoc Council: Treasurer 2012-2013. Council member 2013–2016. Organized 2012 student-invited speaker in organic chemistry (Sam Danishefsky, MSKCC) and 2013 student-invited speaker in chemical biology (Linda Hsieh-Wilson, CalTech).

Science Rendezvous Volunteer 2006–2007. Annual public science outreach event organized through UofT.

Community

Stanford University Cycling Team: Coach. 2020–Present. Responsible for teaching bicycle racing to students within the Stanford community. Involves leading classroom sessions on training and racing, leading practical skills sessions and team rides, and serving as a mentor to students to help them achieve their training and racing goals.

Alto Velo Racing Club: Elected to board of directors. 2022–Present. Responsible for directing club operations (200+ members) and assisting with management of men's racing team.

Last Updated: October 18, 2022