

**CAROLINE PROULX, Ph.D.**

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**NC STATE  
UNIVERSITY**

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**PROFESSIONAL EXPERIENCE**

<b>Assistant Professor</b> Department of Chemistry, North Carolina State University, Raleigh, NC.	2016 – present
<b>NSERC Postdoctoral Fellow</b> Lawrence Berkeley National Laboratory, Berkeley, CA. Supervisor: Dr. Ronald N. Zuckermann	2012 – 2016

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**EDUCATION**

<b>Ph.D. Chemistry</b> Université de Montréal, Montréal, Québec, Canada. Thesis title: <i>“Methodology for the combinatorial synthesis of azapeptides: application to the synthesis of aza-GHRP-6 analogs as CD36 receptor ligands.”</i> Supervisor: Dr. William D. Lubell. Dean’s honor list.	Dec 2012
<b>Hon. B. Sc. Biopharmaceutical Sciences, Medicinal Chemistry</b> University of Ottawa, Ottawa, Ontario, Canada. Undergraduate research project supervisor: Dr. Robert N. Ben. Dean’s honor list.	May 2007

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**AWARDS AND DISTINCTIONS**

2021	NSF CAREER Award
2021	Early Career Lectureship, American Peptide Society
2020	LeRoy and Elva Martin Award for Teaching Excellence
June 2013-2015	Postdoctoral Fellowship (PDF), Natural Sciences and Engineering Research Council of Canada (NSERC), \$80,000
May 2013	Dean’s honor list, Ph.D. graduation, Université de Montréal.
Sept 2010-2012	Post-Graduate Doctoral Scholarship (PGS D2), Natural Sciences and Engineering Research Council of Canada (NSERC), \$42,000
Sept 2009	Boehringer-Ingelheim Scholarship, \$19,000
Sept 2008	Scholarship for direct transfer to the Ph.D., \$14,000
Sept 2007-2008	Post-Graduate Scholar Master’s Award, Natural Sciences and Engineering Research Council of Canada (NSERC), \$34,600
Nov 2008	Best poster award, Québec-Ontario Minisymposium on Bio-Organic and Synthetic Chemistry, valued at \$100.
Aug 2008	Merck Index Women in Chemistry Scholarship Award of Special Recognition, valued at \$500.
Summer 2006	NSERC Undergraduate Student Research Award, \$4,500 (USRA, Prof. Robert N. Ben)
Summer 2005	NSERC Undergraduate Student Research Award, \$4,500 (USRA, Prof. Ann English)
2003-2006	Dean’s List, University of Ottawa.
2003-2006	University of Ottawa Admission scholarship, \$14,000
<u>Awards Declined:</u>	
May 2007	Ontario-Québec Fellowship Exchange Scholarship, valued at \$10,000, renewable 2 years.

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## RESEARCH CONTRIBUTIONS

### Refereed Journal Publications

#### NCSU

35. Young, H. A.; Proulx, C.\* "On-Resin C $\alpha$ -Functionalization of *N*-Arylglycyl Peptides with Boronic Acids". *Org. Biomol. Chem.* **2022**, in revision.
34. Bowles, M. O.; Proulx, C.\* "Late-Stage *N*-Alkylation of Azapeptides". *Org. Lett.* **2022**, *24*, 1768.
33. Davern, C. M.; Lowe, B. D.; Rosfi, A.; Ison, E. A.; Proulx, C.\* "Submonomer Synthesis of Peptoids Containing *trans*-inducing *N*-imino- and *N*-alkylamino-glycine Monomers". *Chem. Sci.* **2021**, *12*, 8401.
32. Bowles, M.; Proulx, C.\* "Solid Phase Submonomer Azapeptide Synthesis". *In Methods in Enzymology*; Academic Press: **2021**.
31. Proulx, C. "Catching up to nature's ribosomes". *Science* **2020**, *368*, 941.  
*\*Perspective on an article by Hartrampf, N. et al. Synthesis of proteins by automated flow chemistry. Science 2020, 368, 980-987.*
30. Young, H. A.; Guthrie, Q. A. E.; Proulx, C.\* "*N*-Arylation of Amino Acid Esters to Expand Side Chain Diversity in Ketoxime Peptide Ligations". *J. Org. Chem.* **2020**, *85*, 1748.
29. Reese, H. R.; Shanahan, C. C.; Proulx, C.; Menegatti, S.\* "Peptide Science: a "Rule Model" for New Generations of Peptidomimetics". *Acta Biomaterialia* **2020**, *102*, 35.
28. Guthrie, Q. A. E.; Young, H. A.; Proulx, C.\*; "Ketoxime Peptide Ligations: Oxidative Couplings of Alkoxyamines to *N*-Aryl Peptides". *Chem. Sci.* **2019**, *10*, 9506-9512.
27. McMechen, M. A.; Willis, E. L.; Gourville, P. C.; Proulx, C.\* "Aza-amino Acids Disrupt Beta-sheet Secondary Structures". *Molecules* **2019**, *24*, 1919.
26. Guthrie, Q. A. E.; Proulx, C.\* "Oxime Ligation *via in situ* Oxidation of *N*-Phenylglycyl Peptides". *Org. Lett.* **2018**, *20*, 2564.  
*\*Highlighted in Synform 2018/09, A137–A140.*

#### NCSU, from Ph.D. and postdoc studies

25. Proulx, C.; Zhang, J.; Sabatino, D.; Chemtob, S.; Ong, H.; Lubell, W. D. Synthesis and Biomedical Potential of Azapeptide Modulators of the Cluster of Differentiation 36 Receptor (CD36). *Biomedicines*. 2020, *8*, 241.
24. Frégeau, G.; Sarduy, R.; Elimam, H.; Esposito, C. L.; Mellal, K.; Ménard, L.; Leitão da Graça, S. D.; Proulx, C.; Zhang, J.; Febbraio, M.; Soto, Y.; Lubell, W. D.; Ong, H.; Marleau, S. Atheroprotective and Atheroregressive Potential of Azapeptide Derivatives of GHRP-6 as Selective CD36 Ligands in Apolipoprotein E-deficient Mice. *Atherosclerosis* 2020. *307*, 52.
23. Battigelli, A.; Kim, J. H.; Dehigaspitiya, D. C.; Proulx, C.; Robertson, E. J.; Murray, D. J.; Rad, B.; Kirshenbaum, K.; Zuckermann, R. N.\* "Glycosylated Peptoid Nanosheets as a Multivalent Scaffold for Protein Recognition." *ACS Nano*. **2018**, *12*, 2455.
22. Huynh, D. N.; Bessi, V. L.; Menard, L.; Piquereau, J.; Proulx, C.; Febbraio, M.; Lubell, W. D.; Carpentier, A. C.; Burelle, Y.; Ong, H.; Marleau, S.\* "Adiponectin has a Pivotal Role in the Cardioprotective Effect of CP-3(iv), a Selective CD36 Azapeptide Ligand, after Transient Coronary Artery Occlusion in Mice". *FASEB J.* **2018**, *32*, 807.
21. Chingle, R.; Proulx, C.; Lubell, W. D.\* "Azapeptide Synthesis Methods for Expanding Side-Chain Diversity for Biomedical Applications" *Acc. Chem. Res.* **2017**, *50*, 1541.

#### Prior to NCSU, from Ph.D. and postdoc studies

20. Robertson, E. J.; Proulx, C.; Su, J. K.; Garcia, R. L.; Yoo, S.; Nehls, E. M.; Connolly, M. D.; Taravati, L.; Zuckermann, R. N.\* "Molecular Engineering of the Peptoid Nanosheet Hydrophobic Core" *Langmuir* **2016**, *32*, 11946.  
*\*Featured as the ACS Editors' Choice*
19. Proulx, C.; Noë, F.; Yoo, S.; Connolly, M. D.; Zuckermann, R. N.\* "On-Resin *N*-Terminal Peptoid Degradation: Toward Mild Sequencing Conditions". *Biopolymers (Pept. Sci.)* **2016**. *106*, 726.
18. Flood, D.; Proulx, C.; Robertson, E. J.; Battigelli, A.; Wang, S.; Schwartzberg, A.; Zuckermann, R. N.\* "Improved Chemical and Mechanical Stability of Peptoid Nanosheets by Photo-crosslinking the Hydrophobic Core". *Chem. Commun.* **2016**, *52*, 4753.  
*\*Featured as the inside front cover for the April 4<sup>th</sup>, 2016 issue.*

17. Robertson, E. J.; Battigelli, A.; Proulx, C.; Mannige, R. V.; Haxton, T. K.; Whitlam, S.; Zuckermann, R. N.\* "Design, Synthesis, Assembly and Engineering of Peptoid Nanosheets". *Acc. Chem. Res.* **2016**, *49*, 379.  
*\*Featured as the front cover for the March 16<sup>th</sup>, 2016 issue.*
16. Mannige, R. V.; Haxton, T. K.; Proulx, C.; Robertson, E. J.; Battigelli, A.; Butterfoss, G. L.; Zuckermann, R. N.\*; Whitlam, S.\* "Peptoid Nanosheets Exhibit a New Secondary Structure Motif". *Nature* **2015**, *526*, 415.  
*\*Featured in C&En news article: "Peptoids Do a Double Twist", C&En, Oct. 12<sup>th</sup>, 2015, 93(40), p.30.*
15. Proulx, C.; Yoo, S.; Connolly, M. D.; Zuckermann, R. N.\* "Accelerated Submonomer Solid-Phase Synthesis of Peptoids Incorporating Multiple Substituted *N*-Aryl Glycine Monomers". *J. Org. Chem.* **2015**, *80*, 10490.  
*\*Featured as the front cover for the November 6<sup>th</sup>, 2015 issue.*
14. Sanii, B.; Haxton, T. K.; Olivier, G. K.; Cho, A.; Barton, B.; Proulx, C.; Whitlam, S.; Zuckermann, R. N.\* "Structure-Determining Step in the Hierarchical Assembly of Peptoid Nanosheets". *ACS Nano* **2014**, *8*, 11674-11684.
13. Robertson, E. J.; Olivier, G. K.; Qian, M.; Proulx, C.; Zuckermann, R. N.\*; Richmond, G. L.\* "Assembly and Molecular Order of Two-Dimensional Peptoid Nanosheets at the Oil-Water Interface". *Proc. Natl. Acad. Sci.* **2014**, *111*, 13284-13289.
12. Zhang, J.; Proulx, C.; Tomberg, A.; Lubell, W. D.\* "Multicomponent Diversity-Oriented Synthesis of Aza-Lysine-Peptide Mimics". *Org. Lett.* **2014**, *16*, 298-301.
11. Proulx, C.; Lubell, W. D.\* "Analysis of *N*-amino-imidazolin-2-one Peptide Turn Mimic 4-position Substituent Effects on Conformation by X-ray Crystallography". *Biopolymers (Pept. Sci.)* **2014**, *102*, 7-15.
10. Proulx, C.; Lubell, W. D.\* "*N*-Amino-imidazolin-2-one Peptide Mimic Synthesis and Conformational Analysis". *Org. Lett.* **2012**, *14*, 4552-4555.  
*\*Article recognized as a significant contribution in the field of peptide sciences by Dr. Roger Freidinger (F1000 Faculty).*
9. García-Ramos, Y.; Proulx, C.; Lubell, W. D.\* "Synthesis of Hydrazine and Azapeptide Derivatives by Alkylation of Carbazates and Semicarbazones". *Can. J. Chem.* **2012**, *90*, 985-993.
8. Proulx, C.; Picard, É.; Boeglin, D.; Pohankova, P.; Chemtob, S.; Ong, H.; Lubell, W. D.\* "Azapeptide Analogs of the Growth Hormone Releasing Peptide 6 as Cluster of Differentiation 36 Receptor Ligands with Reduced Affinity for the Growth Hormone Secretagogue Receptor 1a". *J. Med. Chem.* **2012**, *55*, 6502-6511.
7. Sabatino, D.; Proulx, C.; Pohankova, P.; Ong, H.; Lubell, W. D.\* "Structure-Activity Relationships of GHRP-6 Azapeptide Ligands of the CD36 Scavenger Receptor by Solid-Phase Submonomer Azapeptide Synthesis". *J. Am. Chem. Soc.* **2011**, *133*, 12493-12506.
6. Proulx, C.; Sabatino, D.; Hopewell, R.; Spiegel, J.; García Ramos, Y.; Lubell, W. D.\* "Azapeptides and their Therapeutic Potential". *Future Med. Chem.* **2011**, *3*, 1139-1164.
5. Bolduc, O. R.; Lambert-Lanteigne, P.; Colin, D. Y.; Zhao, S. S.; Proulx, C.; Boeglin, D.; Lubell, W. D.; Pelletier, J. N.; Féthière, J.; Ong, H.; Masson, J.-F.\* "Modified Peptide Monolayer Binding His-tagged Biomolecules for Small Ligand Screening with SPR Biosensors". *Analyst* **2011**, *136*, 3142-3148.
4. Proulx, C.; Lubell, W. D.\* "Aza-1,2,3-triazole-3-alanine Synthesis via Copper-Catalyzed 1,3-Dipolar Cycloaddition on Aza-progargylglycine". *J. Org. Chem.* **2010**, *75*, 5385-5387.  
*\*Article in Synfacts (2010) 11: 1311.*
3. Proulx, C.; Lubell, W. D.\* "Copper-Catalyzed *N*-Arylation of Semicarbazones for the Synthesis of Aryl-Azaglycine Containing Azapeptides". *Org. Lett.* **2010**, *12*, 2916-2919.
2. Bourguet, C. B.; Proulx, C.; Klocek, S.; Sabatino, D.; Lubell, W. D.\* "Solution-phase Submonomer Diversification of Aza-dipeptide Building Blocks and their Application in Aza-peptide and Aza-DKP Synthesis". *J. Pept. Sci.* **2010**, *16*, 284-296.
1. Sabatino, D.; Proulx, C.; Klocek, S.; Bourguet, C. B.; Boeglin, D.; Ong, H.; Lubell, W. D.\* "Exploring Side-Chain Diversity by Submonomer Solid-Phase Aza-Peptide Synthesis". *Org. Lett.* **2009**, *11*, 3650-3653.

#### Patents

2. "Peptidomimetics Comprising *N*-Amino Cyclic Urea Residues and Uses Thereof" Lubell, William D.; Ong, Huy; Proulx, Caroline; Hopewell, Robert; Beauregard, Kim; García Ramos, Yésica, provisional patent No. US 61/655,682 filed June 5<sup>th</sup>, 2012.
1. "Azapeptides as CD36 Binding Compounds" Ong, Huy; Chemtob, Sylvain; Lubell, William D.; Boeglin, Damien, Proulx, Caroline, Sabatino, David, Sajjadi, Zohreh, serial No. PCT/CA2008/001162 Canada, USA, PCT filed June 18, 2008.

### Refereed book chapters, conference proceedings, and other contributions

5. Sun, J.; Proulx, C.; Zuckermann, R. N. Precision sequence control in bioinspired peptoid polymers. In *Sequence-Controlled Polymers: Synthesis, Self-Assembly, and Properties*, Jean-François Lutz, Makoto Ouchi, Tara Meyer and Mitsuo Sawamoto (Eds.) ACS Symposium Series; American Chemical Society: Washington, DC., 2014, 1170, pp. 25-53.
4. Proulx, C.; Lubell, W. D. "O-(3,4-Dihydro-4-oxo-1,2,3-benzotriazin-3-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate" *Encyclopedia of Reagents for Organic Synthesis*, 2012. A. B. Charette, D. Crich, P. L. Fuchs, G. A. Molander (Eds); John Wiley & Sons Ltd.: Chichester, 2nd Ed.; (I.D.: RN01543).
3. Proulx, C.; Lubell, W. D. "O-(6-Chloro-1H-benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate" *Encyclopedia of Reagents for Organic Synthesis*, 2012. A. B. Charette, D. Crich, P. L. Fuchs, G. A. Molander (Eds); John Wiley & Sons Ltd.: Chichester, 2nd Ed.; (I.D.: RN01544).
2. Proulx, C.; Lubell, W. D. Synthesis of [Azaphenylglycine<sup>4</sup>]- and [Aza-1-phenyl-2,3-triazole-3-alanine<sup>4</sup>]Growth Hormone Releasing Peptide-6 and Comparison of their Conformations with [AzaPhe<sup>4</sup>]GHRP-6. In *Peptides: Building Bridges. Proceedings of the 22<sup>nd</sup> American Peptide Symposium*, Lebl, M., Ed. Prompt Scientific Publishing: San Diego, CA, 2011; pp 80-81.
1. Proulx, C.; Lubell, W. D. Solid-Phase Synthesis of Aza-Proline Analogs of GHRP-6. In *Peptides: Breaking Away. Proceedings of the 21st American Peptide Symposium*, Lebl, M., Ed. Prompt Scientific Publishing: San Diego, CA, 2009; pp 56-57.

### Oral Presentations (excluding student presentations)

33. Proulx, C. "New methods for the chemoselective functionalization of peptides", 14th Australian Peptide Conference, Gold Coast, QLD, Australia, May 8th - 12th 2022.
32. Proulx, C. "On-Resin Late-Stage Functionalization of Azapeptides", 8th Modern Solid Phase Peptide Synthesis & Its Applications Symposium, Gold Coast, QLD, Australia, May 6th - 8th 2022.
31. Proulx, C. "New Tools for Peptide Mimicry and Functionalization", University of Sydney, Sydney, NSW, Australia, May 2<sup>nd</sup>, 2022.
30. Proulx, C. "New methods for the chemoselective functionalization of peptides", Scripps Research, La Jolla, CA, April 22<sup>nd</sup>, 2022.
29. Proulx, C. "Peptide ligations from tunable N-aryl peptide precursors", University of Missouri, Columbia, MO, April 8<sup>th</sup>, 2022.
28. Proulx, C. "New methods for the chemoselective functionalization of peptides", New York University, New York, NY, April 5<sup>th</sup>, 2022.
27. Proulx, C. "New methods for the chemoselective functionalization of peptides", Temple University, March 17<sup>th</sup>, 2022, over zoom.
28. Proulx, C. "New methods for the chemoselective functionalization of peptides", University of Delaware, March 16<sup>th</sup>, 2022, over zoom.
27. Proulx, C. "New methods for the chemoselective functionalization of peptides", University of Pennsylvania, March 14<sup>th</sup>, 2022, over zoom.
26. Proulx, C. "New methods for the chemoselective functionalization of peptides", University of Pittsburgh, March 4<sup>th</sup>, 2022, over zoom.
25. Proulx, C. "New methods for the chemoselective functionalization of peptides", University of North Carolina at Chapel Hill, Chapel Hill, NC, February 24<sup>th</sup>, 2022.
24. Proulx, C. "New methods for the chemoselective functionalization of peptides", University of California Irvine, February 16<sup>th</sup>, 2022, over zoom.
23. Proulx, C. "New methods for the chemoselective functionalization of peptides", Vanderbilt University, January 31<sup>st</sup>, 2022, over zoom.
22. Proulx, C. "New methods for the chemoselective functionalization of peptides", University of South Florida, Tampa, FL, January 19<sup>th</sup>, 2022.
21. Proulx, C. "Synthesis and reactivity of electron-rich N-aryl peptides: from site-selective C $\alpha$ -functionalizations to peptide ligation reactions", Pacificchem, Advancing frontiers in peptide and protein science with nano to macromolecular solutions, new technologies in polyamide synthesis, and applications, December 18<sup>th</sup>, 2021, over zoom.
20. Proulx, C. "Peptide ligations from tunable N-aryl peptide precursors", Emory University, December 6th, 2021, over zoom.
19. Proulx, C. "Synthesis and reactivity of N-aryl peptides: enabling new strategies for peptide ligations", Université de Montréal (Canada), November 24<sup>th</sup>, 2021, over zoom.
18. Proulx, C. "New strategies for peptide ligations", University of Windsor (Canada), November 3<sup>rd</sup>, 2021, over zoom.

17. Proulx, C. "New strategies for peptide ligations", University of Texas at San Antonio, October 22<sup>nd</sup>, 2021, over zoom.
16. Proulx, C. "New strategies for peptide ligations", North Carolina State University, Biochemistry department, September 23<sup>rd</sup>, 2021.
15. Proulx, C. "Peptide ligations from tunable *N*-aryl peptide precursors", University of Bath and Evotec joint virtual seminar, September 7<sup>th</sup>, 2021.
14. Proulx, C. "Submonomer synthesis of peptoids containing *trans*-inducing *N*-imino- and *N*-alkylamino glycines." 262<sup>nd</sup> ACS National Meeting, Development of New Peptidomimetics for Biological Applications, Atlanta, GA, August 2021.
13. Proulx, C. "Peptide ligations from tunable *N*-aryl peptide precursors", First Canadian Peptide and Protein Community Virtual Symposium, May 27<sup>th</sup> 2021 over Zoom.
12. Proulx, C. "Peptide ligations from tunable *N*-aryl peptide precursors", Wayne State University, February 10<sup>th</sup>, 2021, over Zoom.
11. Proulx, C. "Aerobic oxidation of *N*-aryl peptides for catalyst-free oxime ligations", Appalachian State University, Boone, NC, November 1<sup>st</sup>, 2019.
10. Proulx, C. "New strategies for Ketoxime peptide ligations", Boulder Peptide Symposium 2019, Boulder, CO, September 23-26, 2019.
9. Proulx, C. "Oxime ligation via *in situ* oxidation of *N*-phenylglycinyll peptides", Seton Hall University, South Orange, NJ, April 9<sup>th</sup>, 2019.
8. Proulx, C. "*In situ* oxidation of *N*-phenylglycinyll peptides for oxime bond formation at neutral pH", American Peptide Symposium 2019, Monterey, CA, June 22-27, 2019.
7. Guthrie, Q. A. E.; Proulx, C. "Aerobic oxidation of *N*-phenylglycinyll peptides for catalyst-free oxime ligations", American Chemical Society (ACS) meeting, Orlando, Florida, March 31–April 4, 2019.
6. Proulx, C.; Yoo, S.; Connolly, M. D.; Zuckermann, R. N. "Molecular Engineering of the Peptoid Nanosheet Hydrophobic Core", Canadian Society for Chemistry (CSC) meeting, Ottawa, Ontario, June 13–17, 2015.
5. Proulx, C.; Yoo, S.; Connolly, M. D.; Zuckermann, R. N. "Influence of Backbone Flexibility on the Two-dimensional Assembly of Peptoid Nanosheets", American Chemical Society (ACS) meeting, San Francisco, California, August 10-14, 2014.
4. Proulx, C.; Yoo, S.; Zuckermann, R. N. "Improvements in the Solid-Phase Synthesis of Peptoids Incorporating Weak Nucleophile Submonomers", Canadian Society for Chemistry (CSC) meeting, Vancouver, British Columbia, June 1–5, 2014.
3. Zhang, J.; Proulx, C.; Lubell, W. D. "Multi-component Diversity-Oriented Synthesis of Aza-lysine-peptide Mimics", Canadian Society for Chemistry (CSC) meeting, Vancouver, British Columbia, June 1–5, 2014.
2. Proulx, C.; Lubell, W. D. "Tuning the selectivity of GHRP-6 towards the CD36 vs GHS-R1a receptor by exploiting the reactivity of semicarbazones and aza-propargyl glycine in combinatorial azapeptide synthesis", Canadian Society for Chemistry (CSC) meeting, Montréal, Québec, June 5–9, 2011.
1. Proulx, C.; Lubell, W. D. "Copper-catalyzed *N*-arylation of a semicarbazone building block for the parallel synthesis of aryl-azaglycine containing azapeptides", Canadian Society for Chemistry (CSC) meeting, Toronto, Ontario, May 29 – June 2, 2010.

**Poster Presentations** (*excluding student presentations*)

10. Guthrie, Q. A.; Proulx, C.; "Oxime ligation *via in situ* oxidation of *N*-phenylglycinyll peptides", poster presented as part of the Chemistry and Biology of Peptides Gordon Research Conference (GRC), Ventura, California, February 11-16, 2018.
9. Proulx, C.; Su, J. K.; Yoo, S.; Olivier, G. K.; Garcia, R. L.; Connolly, M. D.; Mannige, R. V.; Haxton, T. K.; Whitelam, S.; Zuckermann, R. N. "Molecular Engineering of the Peptoid Nanosheet Hydrophobic Core", poster presented as part of the Annual User Meeting, Berkeley, California, August 25-26, 2014.
8. Proulx, C.; Lubell, W. D. "In search of azapeptide analogs of GHRP-6 with selective affinity for the CD36 vs GHS-R1a receptor: exploiting the reactivity of semicarbazones and aza-propargyl glycine in combinatorial azapeptide synthesis", poster presented as part of the American Peptide Symposium (APS), San Diego, California, June 25–30, 2011.
7. Proulx, C.; Lubell, W. D. "Synthesis of substituted imidazolinones via a cationic gold(I)-mediated intramolecular cyclization", poster presented as part of the Canadian Society for Chemistry (CSC) meeting, Montréal, Québec, June 5–9, 2011.
6. Proulx, C.; Lubell, W. D. "Teaching haemoglobin to third graders", poster presented as part of the Canadian Society for Chemistry (CSC) meeting, Montréal, Québec, June 5–9 2011.

5. Proulx, C.; Lubell, W. D. "Copper-catalyzed *N*-arylation of semicarbazones for the synthesis of aza-arylglycine containing aza-peptides", poster presented as part of the American Chemical Society (ACS) meeting, San Francisco, California, March 21–25, 2010.
4. Proulx, C.; Lubell, W. D. "Cu(I)-catalyzed *N*-arylation of semicarbazones for the synthesis of aryl-aza glycine containing azapeptides", poster presented as part of the Ontario Minisymposium in Synthetic and Bioorganic Chemistry (QOMSBOD) meeting, Québec, Québec, Oct 30–Nov 1, 2009.
3. Proulx, C.; Boeglin, D.; Chemtob, S.; Ong, H.; Lubell, W. D. "Aza-peptide analogs of GHRP-6 with selective receptor affinity for CD36 versus GHS-R1a", poster presented as part of the American Peptide Symposium (APS) meeting, Bloomington, Indiana, June 7–12, 2009. *Poster presentation among the semi-finalists of the Young Investigator poster competition. Travel grant, valued at 100\$.*
2. Proulx, C.; Boeglin, D.; Chemtob, S.; Ong, H.; Lubell, W. D. "Elucidation of structural and conformational requirements for GHRP-6 binding to the GHSR-1a and CD36 receptors using azapeptides", poster presented as part of the Québec-Ontario Minisymposium on Bio-Organic and Synthetic Chemistry (QOMSBOD) meeting, Toronto, Ontario, November 2008.
1. Proulx, C.; Boeglin, D.; Chemtob, S.; Ong, H.; Lubell, W. D. "Aza-peptide analogs of GHRP-6 with selective receptor affinity for CD36 versus GHS-R1a", poster presented as part of the American Chemical Society (ACS) meeting, Philadelphia, Pennsylvania, August 17–21, 2008.

#### **Conference discussion leader / session chair**

3. Australian Peptide Conference, Peptide Chemistry II session, Gold Coast, QLD, Australia (May 2022).
2. American Peptide Symposium, Nanomaterials and Peptide Assemblies session, Monterey, CA (June 2019)
1. GRC on Chemistry and Biology of Peptides, Advances in Peptide and Protein Synthesis session. Ventura, CA (Feb 2018).

### **TEACHING EXPERIENCE**

#### **Courses taught at NCSU**

CH 721 – Physical Organic Chemistry (entry-level graduate course)

Fall 2020 (16 students)  
 Fall 2019 (24 students)  
 Fall 2018 (22 students)  
 Fall 2017 (24 students)  
 Fall 2016 (34 students)

CH 223 – Organic Chemistry II (undergraduate course)

Fall 2021 (189 students)  
 Spring 2021 (230 students)  
 Spring 2020 (200 students)  
 Spring 2019 (206 students)  
 Spring 2018 (126 students)

CH610G – Introduction to Graduate Studies, co-taught with Prof. Denis Fourches

Fall 2019 (30 students)  
 Fall 2018 (32 students)  
 Fall 2017 (37 students)

CH 601/801 – Chemistry Seminar Program (seminar course for all enrolled graduate students)

Fall 2019 (105 students)  
 Spring 2019 (91 students)  
 Fall 2018 (103 students)  
 Spring 2018 (107 students)  
 Fall 2017 (114 students)  
 Spring 2017 (100 students)

#### **Students mentored at NCSU**

##### **Graduate Students**

##### *Current Ph.D candidates*

Carolynn Davern, 06/18 – present, B.Sc. North Carolina Wesleyan College.  
 Hailey Young, 10/18 – present, B.Sc. UNC Wilmington.  
 Maxwell Bowles, 10/19 – present, B.Sc. Southern Utah University.

Ellen Warner, 10/20 – present, B.Sc. Davidson College.

Michael Kirsch, 10/21 – present, B. Sc. SUNY Oswego.

#### *Past Graduates*

Quibria Guthrie, 10/16 – 04/21 Burroughs Wellcome Fellow (Spring 2019), Osteryoung Award in Research Excellence (Spring 2020), now research scientist at CEM (Charlotte, NC).

Evan Willis, M.Sc. 2020, Miles F. Anderson Award in Teaching, Spring 2019.

Michael McMechen, M.Sc. 2018, now scientist at Alcami corporation.

W. Tyler Price, graduate student 10/16 – 01/19.

#### **Undergraduate and High School Students**

##### *Current*

Skylar Harrelson, B. Sc. in progress, Chemical Engineering and Biochemistry (Beckman Scholar, co-mentor with Melanie Simpson), 05/22 – present.

Meric Trombley B. Sc. in progress, NCSU, Chemistry, 03/22 – present.

Ryan Wands B. Sc. in progress, NCSU, Chemistry, 03/22 – present

Meghan Broderick B. Sc. in progress, NCSU, Chemistry, 02/21 – present.

##### *Past*

Briley Humphrey, B. Sc. 2021, NCSU, Chemistry, Titanium Award, 08/19 – 05/21.

Adam Rosfi, B. Sc. 2021, NCSU, Chemistry, 08/19 – 05/21.

Preston Gourville, B.Sc. 2020 NCSU, Chemistry, Goodnight Scholar, Senior Award for Outstanding Scholarship in the Department of Chemistry, 10/17 – 04/20.

Brandon Lowe, B. Sc. in progress, Saint Vincent College, NSF REU student, 05/19 – 08/19.

Sophia Cornish, High School student, ACS project SEED program, 05/19 – 08/19.

Landon Brazda, B.Sc. in progress, NCSU, Biomedical Engineering, 10/18 – 04/19.

Jazmine Lumpkin, B.Sc. St. Edward's U, Biochemistry, NSF REU student, 05/18 – 08/18.

Carolynn Davern, B.Sc. 2018, NC Wesleyan College, Chemistry, NSF REU student, 05/17 – 08/17.

#### **Training of Undergraduate and Postbaccalaureate Students prior to NCSU**

Falko Noe, B. A. Biochemistry/Molecular Biology, UC Berkeley 2015, Zuckermann lab 09/14 – 05/15.

Dillon Flood, B. Sc. Chemistry, UC Berkeley 2016, Zuckermann lab 05/14 – 05/16.

Stan Yoo, B. Sc. Chemistry, UC Berkeley 2013, Zuckermann lab 09/13 – 08/14.

Anna Tomberg, B. Sc. McGill University, Lubell lab summer 2011.

Émilie Canuel, B. Sc. Université de Montréal, Lubell lab summer 2011.

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## **SERVICE**

### **Professional Service on Campus**

2018 – present METRIC Magnetic Resonance User Committee  
2018 – present Faculty Advisory Committee for the College of Sciences  
2016 – present Graduate Students Advisory Committee  
2017 – 2019 Instructor, Introduction to Graduate Studies (CH610G)  
2017 – 2019 NSF-REU Mentor (3 summers)  
2019 Department of Chemistry Lecturer Search Committee  
2019 Goodnight Scholars Online Application Reviewer  
2019 Department of Chemistry Faculty Search Committee

### **Professional Service off Campus**

2016 – present Reviewer: *Science*, *Nature Chemistry*, *Nature Communications*, *Chemical Society Reviews*, *Chemical Science*, *Organic Letters*, *Journal of Organic Chemistry*, *Journal of Medicinal Chemistry*, *Chemical Communications*, *ACS Medicinal Chemistry Letters*, *Peptide Science*, *ChemBioChem*.  
2018 – present Ad Hoc Reviewer, National Science Foundation (NSF), and Natural Sciences and Engineering Research Council of Canada (NSERC).  
2019 – present Fondation Lucien Piché scholarship program reviewing committee.  
2020 – present Co-organizer, online peptoid symposia series 2020/2021.  
2020 – 2022 Proposal Review Board, the Molecular Foundry (Biological Nanostructures Facility)  
2020 Guest Editor, *Frontiers Chemistry*, Special issue on “*Polyamide backbone modification in peptide and protein science*”.

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## **RESEARCH SUPPORT**

### **Current**

#### **NSF CAREER Award (2021-2026)**

“CAREER: Synthesis of Functional Biomolecules from Tunable *N*-aryl Peptide Precursors”.

#### **Comparative Medicine Institute (CMI)-Chemistry of Life (CLP) Research Initiative at the Interface of Chemistry & Life Sciences award (Spring 2022, \$10,000)**

“Optimizing selective inhibitors to a novel target in progression of castration resistant prostate cancer” (PI: Melanie Simpson, co-PI: Caroline Proulx, Joe Barycki).

### **Past**

#### **Faculty Research and Professional Development Fund, College of Sciences (2018-2019 / \$3,000)**

“Rapid Expansion of Chemical Space in Peptidomimetics: Using Aza-amino Acids as Backbone Metal Chelation Sites to Modulate Dihedral Angles in Short Peptides”.