

Nicholas L. Truex
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University of South Carolina
Department of Chemistry & Biochemistry
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EDUCATION

Ph.D., Chemistry, University of California, Irvine	2012 – 2017
B.S., Chemistry, Purdue University	2007 – 2011

RESEARCH

Assistant Professor, University of South Carolina	2022 – present
Postdoctoral Fellow, Professor Bradley L. Pentelute, MIT	2017 – 2022
Graduate Student, Professor James S. Nowick, UC Irvine	2012 – 2017
Undergraduate Research, Professor Ei-ichi Negishi, Purdue (2010 Nobel Laureate)	2008 – 2012
Summer Intern, Eli Lilly and Company	2008 – 2010

HONORS AND AWARDS

NSF CAREER (CHE-2442158)	2025 – 2030
NIH Postdoctoral Fellowship, Ruth L. Kirschstein National Research Service Award	2020 – 2022
MIT Postdoctoral Fellowship, Koch Institute for Integrative Cancer Research	2018
UC Regents' Dissertation Fellowship, UC Irvine	2017
Michael Zach Award for Research and Teaching, UC Irvine	2017
Allergan Graduate Fellowship, UC Irvine	2016

PEER-REVIEWED PUBLICATIONS († equal contribution; * corresponding author)

22. Kjerfve, C.[†]; Kwao, J.K.[†]; Wolfe, J.; Glover, J.; Wood, B.; Golden, C.; **Truex, N.L.*** Recombinant Expression and Automated Flow Synthesis of Fold-Switching Proteins Derived from *Streptococcus* Protein G. *Biochemistry*, **2026**, 65, 1224–1232.
21. De Silva, N.I.U.; Kunwar, P.; Rahman, M.I.R.; Kwao, J.K.; Lehman, N.; Zhang, Z.; Paul, T.; Cheng, C.; **Truex, N.**; Lee, H.-T.*; Zhang, J.* Sequence Determinants of RNA G-quadruplex Unfolding by Arg-rich Regions. *FEBS Lett.* **2026**, DOI: 10.1002/1873-3468.70274.
20. King, A.; Noblitt, D.; Sherron, O.; Kjerfve, C.; Pless, L.; **Truex, N.L.*** An artificial transcription factor that activates potent interferon- γ expression in human Jurkat T Cells. *Front. Mol. Med.* **2025**, 4, 1492370.
19. Vera, A.; **Truex, N.L.**; Sreekanth, V.; Pentelute, B.L.; Choudhary, A.; Raines, R.T. Protective antigen-mediated delivery of an anti-CRISPR protein for precision genome editing. *Proc. Natl. Acad. Sci. U.S.A.* **2025**, 122, e2426960122.
18. **Truex, N.L.[†]**; Mohapatra, S.[†]; Melo, M.; Rodriguez, J.; Li, N.; Abraham, W.; Sementa, D.; Touti, F.; Keskin, D.B.; Wu, C.J.; Irvine, D.J.; Gomez-Bombarelli, R.*; Pentelute, B.L.* Design of Cytotoxic T Cell Epitopes by Machine Learning of Human Degrons. *ACS Cent. Sci.* **2024**, 10, 793–802.
17. Ruttenberg, S. M.; Kreutzer, A. G.; **Truex, N. L.**; Nowick, J. S.* β -Hairpin Alignment Alters Oligomer Formation in A β -Derived Peptides. *Biochemistry* **2024**, 63, 212–218.
16. **Truex, N.L.[†]**; Rondon, A.[†]; Rössler, S.; Hanna, C.; Wang, B.Y.; Lutz, E.; Irvine, D.J.*; Pentelute, B.L.* Enhanced Vaccine Immunogenicity Enabled by Targeted Cytosolic Delivery of Tumor Antigens into Dendritic Cells. *ACS Cent. Sci.* **2023**, 9, 1835–1845.
15. Rojas, A.J.[†]; Wolfe, J.M.[†]; Dhanjee, H.H.; Buslov, I.; **Truex, N.L.**; Liu, R.Y.; Massefski, W.W.; Pentelute, B.L.*; Buchwald, S.L.* Palladium–Peptide Oxidative Addition Complexes for Bioconjugation. *Chem. Sci.* **2022**, 13, 11891–11895.

14. Gazvoda, M.[†]; Dhanjee, H.H.[†]; Rodriguez, J.; Brown, J.S.; Farquhar, C.F.; **Truex, N.L.**; Loas, A.; Buchwald, S.L.*; Pentelute, B.L.* Palladium-Mediated Incorporation of Carborane into Small Molecules, Peptides, and Proteins. *J. Am. Chem. Soc.* **2022**, *144*, 7852–7860; Correction: *J. Am. Chem. Soc.* **2022**, *144*, 10096.
13. Lu, Z.[†]; **Truex, N.L.**[†]; Melo, M.B.; Cheng, Y.; Li, N.; Irvine, D.J.; Pentelute, B.L.* IgG-Engineered Protective Antigen for Cytosolic Delivery of Proteins into Cancer Cells. *ACS Cent. Sci.* **2021**, *7*, 365–378.
12. Loftis, A.R.; Santos, M.S.; **Truex, N.L.**; Biancucci, M.; Satchell, K.J.F.; Pentelute, B.L.* Anthrax Protective Antigen Retargeted with Single-Chain Variable Fragments Delivers Enzymes to Pancreatic Cancer Cells. *ChemBioChem.* **2020**, *21*, 2772–2776.
11. Lu, Z.Y.[†]; Paoletta, B.R.[†]; **Truex, N.L.**[†]; Loftis, A.R.; Liao, X.L.; Rabideau, A.E.; Brown, M.; Busanovich, J.; Beroukhi, R.*; Pentelute, B.L.* Targeting Cancer Gene Dependencies with Anthrax-Mediated Delivery of Peptide Nucleic Acids. *ACS Chem. Biol.* **2020**, *15*, 1358–1369.
10. Jack, S.; Madhivanan, K.; Ramadesikan, S.; Subramanian, S.; Edwards, D.F.; Elzey, B.D.; Dhawan, D.; McCluskey, A.; Kischuk, E.M.; Loftis, A.R.; **Truex, N.L.**; Santos, M.; Lu, M.; Rabideau, A.; Pentelute, B.; Collier, J.; Kaimakiotis, H.; Koch, M.; Ratliff, T.L.; Knapp, D.W.; Aguilar, R.C.* A Novel, Safe, Fast and Efficient Treatment for Her2-Positive and Negative Bladder Cancer Utilizing an EGF-Anthrax Toxin Chimera. *Int. J. Cancer* **2020**, *146*, 449–460.
9. **Truex, N.L.**[†]; Holden, R.L.[†]; Wang, B.Y.; Chen, P.G.; Hanna, S.; Hu, Z.T.; Shetty, K.; Olive, O.; Neuberg, D.; Hacohen, N.; Keskin, D.B.; Ott, P.A.; Wu, C.J.*; Pentelute, B.L.* Automated Flow Synthesis of Tumor Neoantigen Peptides for Personalized Immunotherapy. *Sci. Rep.* **2020**, *10*, 723.
8. Samdin, T.D.; Wierzbicki, M.; Kreutzer, A.G.; Howitz, W.J.; Valenzuela, M.; Smith, A.; Sahrai, V.; **Truex, N.L.**; Klun, M.; Nowick, J.S.* Effects of N-Terminal Residues on the Assembly of Constrained β -Hairpin Peptides Derived from A β . *J. Am. Chem. Soc.* **2020**, *142*, 11593–11601.
7. Wang, Y.; **Truex, N.L.**; Vo, N. D. P.; Nowick, J.S.* Effects of Charge and Hydrophobicity on the Oligomerization of a Peptide Derived from IAPP. *Bioorg. Med. Chem.* **2018**, *26*, 1151–1156.
6. **Truex, N.L.**; Nowick, J.S.* Transmembrane Proteins: Amyloids Hidden in Plain Sight? *Biochemistry* **2017**, *56*, 4735–4736.
5. Wang, Y.; Kreutzer, A.G.; **Truex, N.L.**; Nowick, J.S.* A Tetramer Derived from Islet Amyloid Polypeptide. *J. Org. Chem.* **2017**, *82*, 7905–7912.
4. **Truex, N.L.**; Nowick, J.S.* Coassembly of Peptides Derived from β -Sheet Regions of β -Amyloid. *J. Am. Chem. Soc.* **2016**, *138*, 13891–13900.
3. **Truex, N.L.**; Wang, Y.; Nowick, J.S.* Assembly of Peptides Derived from β -Sheet Regions of β -Amyloid. *J. Am. Chem. Soc.* **2016**, *138*, 13882–13890.
2. Yoo, S.; Kreutzer, A.G.; **Truex, N.L.**; Nowick, J.S.* Square Channels Formed by a Peptide Derived from Transthyretin. *Chem. Sci.* **2016**, *7*, 6946–6951.
1. Xu, S.; **Truex, N.L.**; Swathi, M.; Negishi, E.-I.* Pd-Catalyzed Cross-Coupling Reactions Exhibiting Catalyst Turnover Numbers Exceeding One Million. *Arkivoc* **2012**, *7*, 242. (*Dedicated in Honor of Prof. Keith Smith*).

PREPRINT MANUSCRIPTS

2. Kjerfve, C.; Kwao, J.K.; Glover, J.; Wood, B.; Golden, C.; **Truex, N.L.*** Access to Synthetic Fold-switching Proteins Using Automated Flow Chemistry. *ChemRxiv*. **2025**, 10.26434/chemrxiv-2025-9l2qz.
1. Vera, A.; **Truex, N.L.**; Sreekanth, V.; Pentelute, B.L.; Choudhary, A.; Raines, R.T. Protective antigen-mediated delivery of an anti-CRISPR protein for precision genome editing. *BioRxiv*. **2025**, 2025.02.23.639680v1.

CONFERENCE PRESENTATIONS (presenter indicated by first author)

15. "Artificial transcription factors for reprogramming immune cells." **Truex, N.L.**; Presented at the 271st National Meeting of the American Chemical Society, Biomedical Technologies: Next-Generation Biomedical Platforms: Bridging Sensing, Delivery, and Engineered Biology, Atlanta, GA, March 22–26, 2026; Paper ID: 4421548.
14. "Fast-flow synthesis of fold-switching proteins for expanding the folding code." Kwao, J.K.; Kjerfve, C.; Glover, J.; Wood, B.; Golden, C.; **Truex, N.L.**; Presented at the 271st National Meeting of the American Chemical Society, BIOT Poster Session: Biomolecular Engineering and Biophysical Processes, Atlanta, GA, March 22–26, 2026; Paper ID: 4421564.
13. "Biosynthetic Fold-switching Proteins Derived from *Streptococcus* protein G." Kjerfve, C.; Kwao, J.K.; Wolfe, J.; Glover, J.; Wood, B.; **Truex, N.L.**; Presented at the 271st National Meeting of the American Chemical Society, Oral Session: Biomolecular Engineering and Biophysical Processes: Biomolecule Structure and Function, Atlanta, GA, March 22–26, 2026; Paper ID: 4421139.
12. "Automated flow synthesis of fold-switching proteins for expanding the folding code." **Truex, N.L.** Presented at the 270th National Meeting of the American Chemical Society, Oral Session: Precision Editing of Biomolecules, Washington, DC, August 17–21, 2025; Paper ID: 4328054.
11. "Engineered transcription factor proteins for reprogramming cytokine signaling networks." **Truex, N.L.** Presented at the 270th National Meeting of the American Chemical Society, Oral Session: Rising Stars in Biochemistry and Chemical Biology, Washington, DC, August 17–21, 2025; Paper ID: 4328084.
10. "Programmable transcription factors as protein adjuvants for cancer immunotherapy." **Truex, N.L.** Presented at the 2nd Annual Southeastern Chemical Biology and Drug Discovery Symposium (SCBDDS), Athens, GA, May 21, 2025.
9. "Programmable transcription factors as protein adjuvants for cancer immunotherapy." **Truex, N.L.** Presented at the 116th Annual Meeting of the American Association for Cancer Research (AACR), Chicago, IL, April 24–30, 2025; Abstract ID 467.
8. "Artificial transcription factors for unlocking cancer immunotherapies." **Truex, N.L.** Presented at the 75th Southeastern Regional Meeting of the American Chemical Society, Atlanta, GA, October 24, 2024.
7. "Vaccine Design using Machine Learning of Human Degrons" Mohapatra, S.; **Truex, N.L.**; Melo, M.B.; Li, N.; Abraham, W.; Rodriguez, J.; Irvine, D.J.; Pentelute, B.L.*; Gómez-Bombarelli, R.* Presented at the Neural Information Processing Systems (NeurIPS) 2021 Workshop: Learning Meaningful Representations of Life (LMRL), December 6–10, 2021.
6. "Assembly and Coassembly of Peptides Derived from β -Sheet Regions of β -Amyloid" **Truex, N.L.**; Wang, Y.; Nowick, J.S. Presented at the 2016 Graduate Research Symposium of the ACS Division of Organic Chemistry, Bryn Mawr, PA, July 28–31, 2016.

5. "Effect of Hydrophobicity and Charge in the Oligomerization of Amyloidogenic Peptides and the Design of a pH-Switchable Oligomer" Wang, Y.; **Truex, N.L.**; Wali, H.; Nowick, J.S. Presented at the 45th Western Regional Meeting of the American Chemical Society, San Marcos, CA, November 6–8, 2015.
4. "A β -Hairpin Derived from Transthyretin 106–121 that Forms Square Hydrophobic Channels" Yoo, S.; **Truex, N.L.**; Kreutzer, A.G.; Nowick, J.S. Presented at the 45th Western Regional Meeting of the American Chemical Society, San Marcos, CA, November 6–8, 2015.
3. "Mimicry and Study of Amyloidogenic Peptides with Macrocyclic β -Sheet Models" Ferrick, K.R.; **Truex, N.L.**; Nowick, J.S. Presented at the 44th National Organic Chemistry Symposium, Philadelphia, PA, June 28–July 2, 2015; paper T41.
2. "Assembly of Peptides Derived from the Central and C-Terminal Regions of β -Amyloid" **Truex, N.L.**; Nowick, J.S. Presented at the 2015 Data Science Initiative Summer Fellows Program, Irvine, CA, May 29, 2015.
1. "Molecular Recognition between Chemical Models of β -Amyloid Peptides." **Truex, N.L.**; Wang, Y.; Dong, V.; Nowick, J.S. 2013. Presented at the 246th National Meeting of the American Chemical Society, Indianapolis, IN, September 8–12, 2013.

PATENTS / PATENT DISCLOSURES

3. King, A.; Sherron, O.; Pless, L.; Ponder, H.; Beato, V.; Truex, N.L. Engineering Immune Responses with Programmable Transcription Factors. USC Application Serial No.: 1699, Filed on: April 26, 2024. [Originated at USC]
2. Choudhary, A.; Vera, A.; Pentelute, B.L.; Truex, N.L.; Raines, R.T. Anti-CRISPR Delivery Compositions and Methods. Application Serial No.: 63/447,235, Filed on: February 21, 2023. Publication Date: August 29, 2024 [Originated at MIT]
1. Truex, N.L.; Rondon, A.; Rössler, S.L.; Hanna, C.; Cho, Y.; Wang, B.-Y.; Backlund, C.M.; Lutz, E.A.; Irvine, D.J.; Pentelute, B.L. Enhanced Vaccine Immunogenicity Enabled by Targeted Cytosolic Delivery of Tumor Antigens into Dendritic Cells. Application Serial No.: 63/517952, Filed on: August 07, 2023 [Originated at MIT]

TEACHING

FA23	CHEM 753 / BIOL 717	Biological Chemistry & Enzymology Protein Chemistry
SP23	CHEM 555 / BIOL 545	Intro to Biochemistry
FA24	CHEM 753 / BIOL 717	Biological Chemistry & Enzymology Protein Chemistry
FA24	CHEM 555 / BIOL 545	Intro to Biochemistry
FA25	CHEM 753 / BIOL 717	Biological Chemistry & Enzymology Protein Chemistry
SP26	CHEM 555 / BIOL 545	Intro to Biochemistry

SERVICE

Coordinator, ACS Project SEED, USC Department of Chemistry and Biochemistry 2024 – present

PROFESSIONAL AFFILIATIONS

American Association for Cancer Research (AACR) 2024 – present
 American Chemical Society (ACS) 2013 – present

EXTRAMURAL FUNDING

1. **National Science Foundation (NSF) CAREER Award (CHE-2442158)** 2025–2030
 "Synthetic Protein Switches for Expanding the Folding Code"
 PI: Nicholas Truex | August 1, 2025 – July 31, 2030

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| 2. NIH COBRE Center for Targeted Therapeutics, Target Faculty Award
“Synthetic Transcriptional Activators for Cancer Immunotherapy”
PI: Nicholas Truex February 1, 2023 – April 30, 2025 | 2023–2025 |
| 3. National Institutes of Health (NIH), F32 CA239362
“Cytosolic Delivery of Tumor Antigens into Dendritic Cells”
PI: Nicholas Truex January 1, 2020 – August 1, 2023 | 2020 –2023 |