

Curriculum Vitae
Barbara Imperiali

Department of Biology and Department of Chemistry
Massachusetts Institute of Technology
Cambridge, MA 02139

Education:

- 1979 *University College London, London, England*
B.Sc. Medicinal Chemistry. First Class (Honours)
1983 *Massachusetts Institute of Technology, Cambridge, MA*
Ph.D. in Synthetic Organic Chemistry

Date of Birth: January 1, 1957

Professional Experience:

- 1983 *Massachusetts Institute of Technology*
Postdoctoral Associate with Dr. S. Masamune
1984 *Brandeis University*
Postdoctoral Associate with Dr. R. H. Abeles
1986 *Carnegie Mellon University*
Assistant Professor of Chemistry
1989 *California Institute of Technology*
Assistant Professor of Chemistry
1995 *California Institute of Technology*
Associate Professor of Chemistry
1997 *California Institute of Technology*
Professor of Chemistry
1999 *Massachusetts Institute of Technology*
Ellen Swallow Richards Professor of Chemistry
2002 *Massachusetts Institute of Technology*
Ellen Swallow Richards Professor of Chemistry and Professor of Biology
2004 *Massachusetts Institute of Technology*
Class of 1922 Professor of Chemistry and Professor of Biology
2011 *Broad Institute*
Associate Member
2015 *AssayQuant Technologies* Co-Founder and CTO

Honors:

- 1979 Kennedy Memorial Trust Graduate Fellowship
1985 American Cancer Society Postdoctoral Fellowship
1992 Associated Students of the California Institute of Technology (ASCIT) Award for Excellence in Teaching
1992 Lilly Grantee Award
1993 Alfred P. Sloan Research Fellow
1993 Camille and Henry Dreyfus Teacher-Scholar Award
1993 Richard M. Badger Teaching Award
1993 Zeneca Chemistry Award for Excellence in Chemistry
1994 Graduate Student Council Award for Exceptional Teaching and Mentorship

- 1995 ASCIT Award for Excellence in Teaching
- 1996 American Chemical Society - Arthur C. Cope Scholar Award
- 1998 5th Annual Richard P. Feynman Award for Excellence in Teaching (Caltech)
- 2001 Elected to the American Academy of Arts and Sciences
- 2002 MIT School of Science Award for Excellence in Undergraduate Education
- 2003 Margaret McVicar Faculty Fellow (in recognition of contributions to education at MIT)
- 2004 Admitted as a Fellow of the Royal Society of Chemistry (FRSC)
- 2006 American Chemical Society - Ronald Breslow Award for Achievement in Biomimetic Chemistry
- 2006 American Peptide Society - Vincent du Vigneaud Award for Peptide Chemistry
- 2006 Protein Society - Emil T. Kaiser Award
- 2010 Elected to the National Academy of Sciences, USA

National and International Professional Activities:

- 1992 Co-Chair and organizer of the first Gordon Research Conference on Bioorganic Chemistry.
- 1993-1994 Member, Nominating Committee, Division of Biological Chemistry, American Chemical Society.
- 1994 Program Committee Member for Fourteenth American Peptide Symposium, Columbus, OH.
- 1995- Member, Editorial Board *Archives of Biochemistry and Biophysics*.
- 1995 Member, Organizing Committee 15th Enzyme Mechanisms Conference, Naples, FL.
- 1996 Co-Chair of Chemistry and Biology of Peptides Gordon Research Conference, Ventura, CA 1998.
- 1996-2000 Member, National Institutes of Health - Bioorganic and Natural Products Study Section.
- 1996-2000 At-large member of the Council of the Gordon Research Conferences.
- 1996-2008 Member, Board of Consulting Editors *Bioorganic and Medicinal Chemistry Letters* and *Bioorganic and Medicinal Chemistry*.
- 1996- Member, Editorial Board *Current Opinions in Chemical Biology*.
- 1997- Member, Editorial Board *Chemistry and Biology*.
- 1997-2002 Council Member, American Peptide Society.
- 1997-2000 Council Member, Division of Biological Chemistry, American Chemical Society.
- 1998-2000 Protein Design Labs, Inc. Member Scientific Advisory Board.
- 1999-2002 Member, Advisory Board for Novartis, Basel, Switzerland.
- 1999-2007 Member, Editorial Advisory Board *Organic Letters*.
- 2000-2002 Co-organizer, NSF Workshop in Physical Organic Chemistry.
- 2000-2002 Member, Editorial Advisory Board *Journal of Organic Chemistry*.
- 2000-2016 Member, Editorial Advisory Board *Biochemistry*.
- 2000-2002 Member, Editorial Advisory Board *Accounts of Chemical Research*.
- 2000-2020 Member, Editorial Advisory Board *Chemistry – A European Journal*.
- 2000-2006 Associate Editor, Chemical Biology (USA) – *Chemical Communications*.
- 2000-2017 Member and Chair, Scientific Advisory Board Novartis Institute for Tropical Diseases, Singapore.

2001-2006 Member, Scientific Advisory Board Syntonix, Waltham, MA.
2003-2008 Member Advisory Board Complex Carbohydrate Resource Center, University of Georgia, Athens, GA.
2005-2007 Member, Novartis Foundation Scientific Advisory Panel.
2006-2009 Member, Whitehead Institute Advisory Board.
2007-2008 Associate Editor (The Americas) - *Bioorganic and Medicinal Chemistry*.
2008-2011 Director – MIT Chemistry Biology Interface NIH Training Program.
2010 -2016 Editorial Advisory Board – *Journal of the American Chemical Society*
2011- Co-chair, Editorial Advisory Board – *ChemBioChem*.
2012-2013 Member, Nominating Committee, ASBMB.
2014- Member, Steering Committee, NIH Workshop on Mentoring New Investigators in Organic and Biological Chemistry.
2017-2021 Member, National Institutes of Health - MSFA Study Section
2018-2020 Member, Astra-Zeneca, Scientific Advisory Board
2019- Member, Editorial Advisory Board – *ACS Chemical Biology*
2020- Member, Editorial Advisory Board – *Cell Chemical Biology*

Barbara Imperiali - Publications

1. "Stereoselective Aldol Condensation: Use of Chiral Boron Enolates," Masamune, S.; Choy, W.; Kerdesky, F. A. J.; Imperiali, B. *J. Am. Chem. Soc.* **1981**, *103*, 1566-1568.
2. "Synthesis of Ansamycins: The Ansa Chain of Rifamycin S," Masamune, S.; Imperiali, B.; Garvey, D. S. *J. Am. Chem. Soc.* **1982**, *104*, 5528-5531.
3. "Synthesis of Tylonolide, the Aglycone of Tylosin," Jackson, W. P.; Lu, L. D-L.; Imperiali, B.; Choy, W.; Tobita, H.; Masamune, S. In *Strategies and Tactics in Organic Synthesis*; Lindberg, T., Ed.; Academic Press: Orlando, 1984; p 123-153.
4. "A Versatile Synthesis of Peptidyl Fluoromethyl Ketones," Imperiali, B.; Abeles, R. H. *Tetrahedron Lett.* **1986**, *27*, 135-138.
5. "Inhibition of Serine Proteases by Peptidyl Fluoromethyl Ketones," Imperiali, B.; Abeles, R. H. *Biochemistry*, **1986**, *25*, 3760-3767.
6. "Biosynthetic Thiolase from *Zoogloea ramigera*. 1. Preliminary Characterization and Analysis of the Proton Transfer Reaction," Davis, J. T.; Moore, R. N.; Imperiali, B.; Pratt, A. J.; Kobayashi, K.; Masamune, S.; Sinskey, A. J.; Walsh, C. T.; Fukui, T.; Tomita, K. *J. Biol. Chem.* **1987**, *262*, 82-89.
7. "Extended Binding Inhibitors of Chymotrypsin which Interact with Leaving Group Subsites S₁'-S₃'," Imperiali, B.; Abeles, R. H. *Biochemistry*, **1987**, *26*, 4474-4477.
8. "Synthetic Fluoropeptides as Pharmacologically Useful Compounds," Imperiali, B. In *Advances in Biotechnological Processes (Synthetic Peptides in Biotechnology)*; Mizrahi, A., Ed.; Alan R. Liss: New York, 1988; p 97-129.
9. "Synthesis of Dolichols via Asymmetric Hydrogenation of Plant Polyprenols," Imperiali, B.; Zimmerman, J. W. *Tetrahedron Lett.* **1988**, *29*, 5343-5344.
10. "Synthesis of Dolichylpyrophosphate-Linked Oligosaccharides," Imperiali, B.; Zimmerman, J. W. *Tetrahedron Lett.* **1990**, *31*, 6485-6488.
11. "Differences between Asn-Xaa-Thr-Containing Peptides: A Comparison of Solution Conformation and Substrate Behavior with Oligosaccharyltransferase," Imperiali, B.; Shannon, K. L. *Biochemistry*, **1991**, *30*, 4374-4380.
12. "(S)- α -Amino-(2,2'-bipyridine)-6-Propanoic Acid: A Versatile Amino Acid for *de novo* Metalloprotein Design," Imperiali, B.; Fisher, S. L. *J. Am. Chem. Soc.* **1991**, *113*, 8527-8528.
13. "Stereoselective Synthesis and Peptide Incorporation of (S)- α -Amino-(2,2'-bipyridine)-6-Propanoic Acid," Imperiali, B.; Fisher, S. L. *J. Org. Chem.* **1992**, *57*, 757-759.
14. "A Conformational Study of Peptides with the General Structure Ac-L-Xaa-Pro-D-Xaa-L-Xaa-NH₂: Spectroscopic Evidence for a Peptide with Significant β -Turn Character in Water and Dimethyl Sulfoxide," Imperiali, B.; Fisher, S. L.; Moats, R. A.; Prins, T. J. *J. Am. Chem. Soc.* **1992**, *114*, 3182-3188.
15. "Role of Peptide Conformation in Asparagine-Linked Glycosylation," Imperiali, B.; Shannon, K. L.; Rickert, K. W. *J. Am. Chem. Soc.* **1992**, *114*, 7942-7944.
16. "A Mechanistic Proposal for Asparagine-Linked Glycosylation," Imperiali, B.; Shannon, K. L.; Unno, M.; Rickert, K. W. *J. Am. Chem. Soc.* **1992**, *114*, 7944-7945.
17. "Chemoenzymatic Synthesis of 2-Amino-3-(2,2'-bipyridinyl)-Propanoic Acids," Imperiali, B.; Prins, T. J.; Fisher, S. L. *J. Org. Chem.* **1993**, *58*, 1613-1616.
18. "The Reverse Turn as a Template for Metal Coordination," Imperiali, B.; Kapoor, T. M. *Tetrahedron* **1993**, *49*, 3501-3510.
19. "Semisynthesis of Bipyridyl-Alanine Cytochrome *c* Mutants: Novel Proteins with Enhanced Electron-Transfer Properties," Wuttke, D. S.; Gray, H. B.; Fisher, S. L.; Imperiali, B. *J. Am. Chem. Soc.* **1993**, *115*, 8455-8456.
20. "Investigation of the Origins of Specificity and Reactivity in N-Linked Protein Glycosylation," Imperiali, B.; Rickert, K. W. ACS Symposium Series Publication 551; Hedin, P. A.; Menn, J. J.; Hollingworth, R. M. American Chemical Society: Washington, DC, 1994; pp 425-435.
21. "Structural and Functional Characterization of a Constrained Asx-Turn Motif," Imperiali, B.; Spencer, J. R.; Struthers, M. D. *J. Am. Chem. Soc.* **1994**, *116*, 8424-8425.

22. "Coenzyme-Amino Acid Chimeras: New Residues for the Assembly of Functional Proteins," Imperiali, B.; Sinha Roy, R. *J. Am. Chem. Soc.* **1994**, *116*, 12083-12084.
23. "Conformational Implications of Asparagine-Linked Glycosylation," Imperiali, B.; Rickert, K. W. *Proc. Natl. Acad. Sci. USA*, **1995**, *92*, 97-101. PMID: PMC42824
24. "Stereoselective Synthesis and Peptide Incorporation of a Pyridoxal Coenzyme-Amino Acid Chimera" Imperiali, B.; Sinha Roy, R. *J. Org. Chem.* **1995**, *60*, 1891-1894.
25. "Sulfhydryl Modification of the Yeast Wbp1p Subunit Inhibits Oligosaccharyl Transferase Activity," Pathak, R.; Hendrickson, T.L.; Imperiali, B. *Biochemistry*, **1995**, *34*, 4179-4185.
26. "The Essential Yeast *NLT1* Gene Encodes the 64 kDa Glycoprotein Subunit of the Oligosaccharyl Transferase," Pathak, R.; Parker, C. S.; Imperiali, B. *FEBS Lett.* **1995**, *362*, 229-234.
27. "Metal-Ion Dependence of Oligosaccharyl Transferase: Implications for Catalysis," Imperiali, B.; Hendrickson, T. L. *Biochemistry*, **1995**, *34*, 9444-9450.
28. "Analysis of the Conserved Glycosylation Site in the Nicotinic Acetylcholine Receptor: Potential Roles in Complex Assembly," Rickert, K. W.; Imperiali, B. *Chemistry and Biology*, **1995**, *2*, 751-759.
29. "Asparagine-Linked Glycosylation: Specificity and Function of *Oligosaccharyl Transferase*," Imperiali, B.; Hendrickson, T. L. *Bioorg. Med. Chem.* **1995**, *3*, 1565-1578.
30. "Design of a Monomeric 23-Residue Polypeptide with Defined Tertiary Structure," Struthers, M. D.; Cheng, R. P.; Imperiali, B. *Science*, **1996**, *271*, 342-345.
31. "Peptidyl Models for Coenzyme Catalysis," Imperiali, B.; Sinha Roy, R.; Wang, L. *Peptides: Chemistry, Structure and Biology, Proceedings of the 14th American Peptide Symposium*, Kaumaya, P. T. P.; Hodges, R. S. (Eds), **1996**, 546-548.
32. "Unnatural Amino Acids for the Design of Functional Proteins: Biomimetic Catalysis Using Coenzyme Amino Acids," Imperiali, B.; Sinha Roy, R.; Walkup, G. K.; Wang, L. in "*Molecular Design and Bioorganic Catalysis*"; Wilcox, C. and Hamilton, A. D., eds.; Kluwer Academic Publishers: Dordrecht, **1996**, pp 35-52.
33. "Synthesis of the Glucoallosamidin Pseudo-disaccharide: Use of an Efficient Hg(II) Mediated Cyclization," Shrader, W. D.; Imperiali, B. *Tetrahedron Lett.* **1996**, *37*, 599-602.
34. "Design and Evaluation of a Peptidyl Fluorescent Chemosensor for Divalent Zinc," Walkup, G. K.; Imperiali, B. *J. Am. Chem. Soc.* **1996**, *118*, 3053-3054.
35. "Economy in Protein Design: Evolution of a Metal-Independent $\beta\beta\alpha$ Motif Based on the Zinc Finger Domains," Struthers, M. D.; Cheng, R. P.; Imperiali, B. *J. Am. Chem. Soc.* **1996**, *118*, 3073-3081.
36. "Stereoselective Synthesis of a Pyridoxamine Coenzyme-Amino Acid Chimera: Assembly of a Polypeptide Incorporating the Pyridoxamine Moiety," Sinha Roy, R.; Imperiali, B. *Tetrahedron Lett.* **1996**, *37*, 2129-2132.
37. "Design and Evaluation of Potent Inhibitors of Asparagine-linked Glycosylation," Hendrickson, T. L.; Spencer, J. R.; Kato, M.; Imperiali, B. *J. Am. Chem. Soc.* **1996**, *118*, 7636-7637.
38. "Metallopeptide Design: Tuning Metal Cation Affinities with Unnatural Amino Acids and Peptide Secondary Structure," Cheng, R. P.; Fisher, S. L.; Imperiali, B. *J. Am. Chem. Soc.* **1996**, *118*, 11349-11356.
39. "Modulation of Protein Structure and Function by Asparagine-Linked Glycosylation," O'Connor, S. E.; Imperiali, B. *Chemistry and Biology*, **1996**, *3*, 803-812.
40. "New Synthetic Amino Acids for the Design and Synthesis of Peptide-Based Metal Ion Sensors," Torrado, A.; Imperiali, B. *J. Org. Chem.* **1996**, *61*, 8940-8948.
41. "A Dual Affinity Tag on the 64kDa Nlt1p Subunit Allows the Rapid Characterization of Mutant Yeast Oligosaccharyl Transferase Complexes," Pathak, R.; Imperiali, B. *Arch. Biochem. Biophys.* **1997**, *338*, 1-6.
42. "Conformational Switching by Asparagine-linked Glycosylation," O'Connor, S. E.; Imperiali, B., *J. Am. Chem. Soc.* **1997**, *119*, 2295-2296.
43. "Pyridoxamine-Amino Acid Chimeras in Semisynthetic Amino-transferase Mimics," Sinha Roy, R.; Imperiali, B. *Protein Engineering*, **1997**, *10*, 691-698.

44. "Fluorescent Chemosensors for Divalent Zinc Based on Zinc Finger Domains. Enhanced Oxidative Stability, Metal Binding Affinity, and Structural and Functional Characterization," Walkup, G. K.; Imperiali, B. *J. Am. Chem. Soc.* **1997**, *119*, 3443-3450.
45. "Structural and Functional Analysis of Peptidyl Oligosaccharyl Transferase Inhibitors," Kellenberger, C.; Hendrickson, T. L.; Imperiali, B. *Biochemistry*, **1997**, *36*, 12554-12559.
46. "Protein Glycosylation: The Clash of the Titans," Imperiali, B. *Acc. Chem. Res.* **1997**, *30*, 452-459.
47. "Biopolymers - Conquering the Giants," (editorial), Dell, A.; Imperiali, B.; McLaughlin, L. *Curr. Opin. Chem. Biol.* **1997**, *1*, 523-525.
48. "The Conformational Basis of Asparagine-Linked Glycosylation," Imperiali, B.; O'Connor, S. E. *Pure and Applied Chem.* **1998**, *70*, 33-40.
49. "Design, Assembly and Characterization of Folded Polypeptides," Imperiali, B. *McGraw-Hill Yearbook of Science and Technology*, **1998**, pp. 290-293.
50. "Exploiting Polypeptide Motifs for the Design of Selective Cu(II) Ion Chemosensors," Torrado, A.; Walkup, G. K.; Imperiali, B. *J. Am. Chem. Soc.* **1998**, *120*, 609-610.
51. "Design and NMR Analyses of Compact Independently Folded BBA Motifs," Struthers, M. D.; Ottesen, J. J.; Imperiali, B. *Folding & Design*, **1998**, *3*, 95-103.
52. "Substrate Assistance in the Mechanism of Family 18 Chitinases: Theoretical Studies of Potential Intermediates and Inhibitors," Brameld, K.; Shrader, W. D.; Goddard, W. A.; Imperiali, B. *J. Mol. Biol.* **1998**, *280*, 913-923.
53. "Design Strategies for the Construction of Independently Folded Polypeptide Motifs," Imperiali, B.; Ottesen, J. J. *Biopolymers*, **1998**, *47*, 23-29.
54. "Stereoselective Synthesis of Fluorescent α -Amino acids Containing Oxine (8-Hydroxyquinoline) and their Peptide Incorporation in Chemosensors for Divalent Zinc," Walkup, G. K.; Imperiali, B. *J. Org. Chem.* **1998**, *63*, 6727-6731.
55. "Peptidyl Chemosensors Incorporating a FRET Mechanism for Detection of Ni(II)," Pearce, D. A.; Walkup, G. K.; Imperiali, B. *Bioorg. Med. Chem. Lett.* **1998**, *8*, 1963-1968.
56. "A Molecular Basis for Glycosylation-Induced Conformational Switching," O'Connor, S. E.; Imperiali, B. *Chem. & Biol.* **1998**, *5*, 427-437.
57. "Model Study for the Incorporation of the (*syn,anti*)-2-Amino-1,3-Diol Functionality in Carbocycles," Tai, V. W.-F.; Imperiali, B. *Tetrahedron Lett.* **1998**, *39*, 7215-7218.
58. "A Reversible Affinity Tag for the Purification of N-Glycolyl Capped Peptides," Shogren-Knaak, M. A.; Imperiali, B. *Tetrahedron Lett.* **1998**, *39*, 8241-8244.
59. "Chemistry and Biology of Asparagine-Linked Glycosylation," Imperiali, B.; O'Connor, S. E.; Hendrickson, T.; Kellenberger, C. *Pure and Applied Chem.* **1999**, *71*, 777-787.
60. "Modulating Pyridoxamine-Mediated Transamination Through a $\beta\beta\alpha$ Motif Peptide Scaffold," Shogren-Knaak, M. A.; Imperiali, B., *Bioorg. Med. Chem.* **1999**, *7*, 1993-2002.
61. "Uniquely Folded Mini-Protein Motifs," Imperiali, B.; Ottesen, J. J. *J. Pept. Res.* **1999**, *54*, 177-184.
62. "Design and Construction of Novel Peptides and Proteins by Tailored Incorporation of Coenzyme Functionality," Imperiali, B.; McDonnell, K. A.; Shogren-Knaak, M. A.; *Topics in Current Chemistry: Implementation and Redesign of Catalytic Function in Biopolymers*, Vol. 202, Schmidtchen, F. P. Ed., Springer-Verlag, **1999**, pp. 1-38.
63. "A Potent Oligosaccharyl Transferase Inhibitor that Crosses the Intracellular Endoplasmic Reticulum Membrane," Eason, P. D.; Imperiali, B. *Biochemistry*, **1999**, *38*, 5430-5437.
64. "Study of the Stability and Unfolding Mechanism of BBA1 by Molecular Dynamics Simulations at Different Temperatures," Wang, L.; Duan, Y.; Shortle, R.; Imperiali, B.; Kollman, P. A. *Protein Science*, **1999**, *8*, 1292-1304. PMID: PMC2144350.
65. "Peptide Platforms for Metal Ion Sensing," Imperiali, B.; Pearce, D. P.; Sohna, J.-E.; Walkup, G. K.; Torrado, A. *SPIE Proceedings*, **1999**, *3858*, 135-143.
66. "Effect of N-Linked Glycosylation on Glycopeptide and Glycoprotein Structure," Imperiali, B.; O'Connor, S. E. *Curr. Opin. Chem. Biol.* **1999**, *3*, 643-649.

67. "Probing the Extended Binding Determinants of Oligosaccharyl Transferase with Synthetic Inhibitors of Asparagine-Linked Glycosylation," Ufret, M. de L.; Imperiali, B. *Bioorg. Med. Chem. Lett.* **2000**, *10*, 281-284.
68. " α -Chloroacetyl Capping of Peptides: An *N*-Terminal Capping Strategy Suitable for Edman Sequencing," Shogren-Knaak, M. A.; McDonnell, K. A.; Imperiali, B. *Tetrahedron Lett.* **2000**, *41*, 827-829.
69. "Biopolymers: Chemical & Biological Approaches for Understanding Form & Function," (editorial) Dell, A.; Famulok, M.; Imperiali, B. *Curr. Opin. Chem. Biol.* **2000**, *4*, 599-601.
70. "Design of a Discretely Folded Mini-Protein Motif with Predominantly β -Structure," Ottesen, J. J.; Imperiali, B. *Nature Structural Biology*, **2001**, *8*, 535-539.
71. "Substrate Specificity of *N*-Acetylglucosaminyl(diphosphodolichol) *N*-Acetylglucosaminyl Transferase, a Key Enzyme in the Dolichol Pathway," Tai, V. W.-F.; O'Reilly, M. K.; Imperiali, B. *Bioorg. Med. Chem.* **2001**, *9*, 1133-1140.
72. "Discovery and Characterization of a Discretely Folded Homotrimeric $\beta\beta\alpha$ Peptide," Mezo, A. R.; Ottesen, J. J.; Imperiali, B. *J. Am. Chem. Soc.* **2001**, *123*, 1002-1003.
73. "Derivatives of 8-Hydroxy-2-methyl-quinoline are Powerful Prototypes for Zinc Sensors in Biological Systems," Pearce, D. P.; Jotterand, N.; Carrico, I. S.; Imperiali, B. *J. Am. Chem. Soc.* **2001**, *123*, 5160-5161.
74. "Asymmetric Synthesis of a New 8-Hydroxyquinoline Derived α -Amino Acid and its Incorporation in a Peptidyl Sensor for Divalent Zinc," Jotterand, N.; Pearce, D. A.; Imperiali, B. *J. Org. Chem.* **2001**, *66*, 3224-3228.
75. "Oligomerization of Uniquely Folded Mini-Protein Motifs: Development of a Homotrimeric BBA Peptide," Mezo, A. R.; Cheng, R. P.; Imperiali, B. *J. Am. Chem. Soc.* **2001**, *123*, 3885-3891.
76. "Asparagine Surrogates for the Assembly of *N*-linked Glycopeptide Mimetics by Chemoselective Ligation," Peluso, S.; Imperiali, B. *Tetrahedron Lett.* **2001**, *42*, 2085-2087.
77. "Probing the Effect of the Outer Saccharide Residues of *N*-Linked Glycans on Peptide Conformation," O'Connor, S. E.; Pohlmann, J.; Imperiali, B.; Saskiawan, I.; Yamamoto, K. *J. Am. Chem. Soc.* **2001**, *123*, 6187-6188.
78. "Substrate Specificity for the Glycosyl Donor of Oligosaccharyl Transferase," Tai, V. W.-F.; Imperiali, B. *J. Org. Chem.* **2001**, *66*, 6217-6228.
79. "Stereoselective Synthesis of β -Linked TBDMS-Protected Chitobiose-Asparagine: A Versatile Building Block for Amyloidogenic Glycopeptides," Bosques, C. J.; Tai, V. W.-F.; Imperiali, B. *Tetrahedron Lett.* **2001**, *42*, 7207-7210.
80. "Oligomeric $\beta\beta\alpha$ Mini-Protein Motifs: Pivotal Role of Single Hinge Residue in Determining the Oligomeric State," McDonnell, K. A.; Imperiali, B. *J. Am. Chem. Soc.* **2002**, *124*, 428-433.
81. "A General Method for the Synthesis of Caged Phosphopeptides: Tools for the Exploration of Signal Transduction Pathways," Rothman, D. M.; Vázquez, M. E.; Vogel, E. M.; Imperiali, B. *Org. Lett.* **2002**, *4*, 2865-2868.
82. "Enantioselective Synthesis and Application of the Highly Fluorescent and Environment-Sensitive Amino Acid 6-(2-dimethylaminonaphthoyl) Alanine (DANA)," Nitz, M.; Mezo, A. R.; Ali, M. H.; Imperiali, B. *Chem. Comm.* **2002**, 1912-1913.
83. "Neoglycopeptides as Inhibitors of Oligosaccharyl Transferase: Insight into Negotiating Product Inhibition," Peluso, S.; Ufret, M. de L.; O'Reilly, M. K.; Imperiali, B. *Chemistry & Biology* **2002**, *9*, 1323-1328.
84. "Oligosaccharyl Transferase: Gatekeeper to the Secretory Pathway," Dempski, R. E. Jr.; Imperiali, B. *Curr. Op. Chem. Biol.* **2002**, *6*, 844-850.
85. "Peptides to Peptidomimetics: Towards the Design and Synthesis of Bioavailable Inhibitors of Oligosaccharyl Transferase," Weerapana, E.; Imperiali, B. *Org. Biomol. Chem.* **2003**, *1*, 93-99.
86. "Lanthanide-Binding Tags as Versatile Protein Coexpression Probes," Franz, K. J.; Nitz, M.; Imperiali, B. *ChemBioChem.* **2003**, *4*, 265-271.

87. "A Powerful Combinatorial Screen to Identify High-Affinity Terbium(III)-Binding Peptides," Nitz, M.; Franz, K. J.; Maglathlin, R. L.; Imperiali, B. *ChemBioChem*. **2003**, *4*, 272-276.
88. "A Chemist's Approach to Biochemical Complexity," Aldridge, S.; Imperiali, B. *Chem. Comm.* **2003**, 445-447.
89. "The Interplay of Glycosylation and Disulfide Formation Influences Fibrillization in a Prion Protein Fragment," Bosques, C. J.; Imperiali, B. *Proc. Natl. Acad. Sci. USA* **2003**, *100*, 7593-7598. PMID: PMC164631
90. "Chemistry and Biochemistry of Asparagine-Linked Protein Glycosylation," Imperiali, B.; Tai, V. W-F. in "*Carbohydrate-based Drug Discovery*"; Wong, C. H., ed. Wiley-VCH Verlag GmbH Publisher: Weinheim, **2003**, pp 281-303.
91. "Photolytic Control of Peptide Self-Assembly," Bosques, C. J.; Imperiali, B. *J. Am. Chem. Soc.* **2003**, *125*, 7530-7531.
92. "Fluorescent Caged Phosphoserine Peptides as Probes to Investigate Phosphate-Dependent Protein Associations," Vázquez, M. E.; Nitz, M.; Stehn, J.; Yaffe, M. B. Imperiali, B. *J. Am. Chem. Soc.* **2003**, *125*, 10150-10151.
93. "A Modular and Tunable Chemosensor Scaffold for Divalent Zinc," Shults, M. D.; Pearce, D. A.; Imperiali, B. *J. Am. Chem. Soc.* **2003**, *125*, 10591-10597.
94. "Caged Phospho-Amino Acid Building Blocks Amenable to Fmoc-based Solid Phase Peptide Synthesis," Rothman, D. M.; Vázquez, M. E.; Vogel, E. M.; Imperiali, B. *J. Org. Chem.* **2003**, *68*, 6795-6798.
95. "Protein Alignment by a Coexpressed Lanthanide-Binding Tag for the Measurement of Residual Dipolar Couplings," Wöhnert, J.; Franz, K. J.; Nitz, M.; Imperiali, B.; Schwalbe, H. S. *J. Am. Chem. Soc.* **2003**, *125*, 13338-13339.
96. "Versatile Fluorescence Probes of Protein Kinase Activity," Shults, M. D.; Imperiali, B. *J. Am. Chem. Soc.* **2003**, *125*, 14248-14249.
97. "Application of Photoactivation and CALI (Chromophore-Assisted Light Inactivation) Technologies to Problems in Cell Motility," Humphrey, D.; Rajfur, Z.; Imperiali, B.; Marriott, G.; Roy, P.; Jacobson, K. in *Live Cell Imaging: A Laboratory Manual*, Spector, D. L.; Goldman, R. D. Eds. Cold Spring Harbor Laboratory Press (2005), Chapter 10, pp 159-176.
98. "Structural Origin of the High Affinity of a Chemically Evolved Lanthanide Binding Peptide," Nitz, M.; Sherawat, M.; Franz, K. J.; Peisach, E.; Allen, K. N.; Imperiali, B. *Angew. Chem. Int. Ed.* **2004**, *43*, 3682-3685.
99. "Effects of Glycosylation on Peptide Conformation: A Synergistic Experimental and Computational Study," Bosques, C. J.; Tschampel, S. M.; Woods, R. J.; Imperiali, B. *J. Am. Chem. Soc.* **2004**, *126*, 8421-8425. PMID: PMC1386730.
100. "Caged Phosphopeptides Reveal a Temporal Role for 14-3-3 in G1 Arrest and S-Phase Checkpoint Function," Nguyen, A.; Rothman, D. M.; Stehn, J.; Imperiali, B.; Yaffe, M. B. *Nature Biotechnology*, **2004**, *22*, 993-1000.
101. "X-Ray Structure Analysis of a Designed Oligomeric Mini-Protein Reveals a Discrete Quaternary Architecture," Ali, M. H.; Peisach, E.; Allen, K. N.; Imperiali, B. *Proc. Natl Acad. Sci. USA*, **2004**, *101*, 12183-12188. PMID: PMC514454.
102. "A New Environment-Sensitive Fluorescent Amino Acid for Fmoc-based Solid Phase Peptide Synthesis," Vázquez, M. E.; Rothman, D. M.; Imperiali, B. *Org. Biomol. Chem.* **2004**, *2*, 1965-1966.
103. "Heterologous Expression and Biophysical Characterization of Soluble Oligosaccharyl Transferase Subunits," Dempski, R. E. Jr.; Imperiali, B. *Arch. Biochem. Biophys.* **2004**, *431*, 63-70.
104. "Caged Phosphoproteins," Rothman, D. M.; Petersson, E. J.; Vázquez, M. E.; Brandt, G. S.; Dougherty, D. A.; Imperiali, B. *J. Am. Chem. Soc.* **2005**, *127*, 846-847.
105. "Photophysics and Biological Applications of the Environment-Sensitive Fluorophore 6-N,N-Dimethylamino-2,3-Naphthalimide" Vázquez, M. E.; Canosa, J. B. B.; Imperiali, B. *J. Am. Chem. Soc.* **2005**, *127*, 1300-1306.

106. "Design of a Heterospecific, Tetrameric, 21-Residue Miniprotein with Mixed α/β Structure" Ali, M. H.; Taylor, C. M.; Grigoryan, G.; Allen, K. N.; Imperiali, B.; Keating, A. E. *Structure*, **2005**, *13*, 225-234.
107. "A Multiplexed Homogenous Fluorescence-Based Assay for Protein Kinase Activity in Cell Lysates," Shults, M. D.; Janes, K. A.; Lauffenburger, D. A.; Imperiali, B. *Nature Methods*, **2005**, *2*, 277-284.
108. "Improving Glycopeptide Synthesis: A Convenient Protocol for the Preparation of β -Glycosylamines and the Synthesis of Glycopeptides" Hackenberger, C. P. R.; O'Reilly, M. O.; Imperiali, B. *J. Org. Chem.* **2005**, *70*, 3574-3578.
109. "The Engineering of Membrane-Permeable Peptides" Carrigan, C. N.; Imperiali, B., *Analytical Biochem.* **2005**, *341*, 290-298.
110. "In situ Photoactivation of a Caged Phosphotyrosine Peptide Derived from Focal Adhesion Kinase Temporarily Halts Lamellar Extension of Single Migrating Tumor Cells" David Humphrey, D.; Rajfur, Z.; Vazquez, M. E.; Scheswohl, D.; Schaller, M. D.; Jacobson, K.; Imperiali, B. *J. Biol. Chem.* **2005**, *280*, 22091-22101.
111. "Protein Oligomerization: How and Why" Ali, M. H.; Imperiali, B. *Bioorg. Med. Chem.* **2005**, *13*, 5013-5020.
112. "Chemical Approaches for Investigating Phosphorylation in Signal Transduction Networks" Rothman, D. M.; Shults, M. D.; Imperiali, B. *Trends Cell. Biol.* **2005**, *15*, 502-510.
113. "Semi-synthesis of a Glycosylated Im7 Analogue for Protein Folding Studies" Hackenberger, C. P. R.; Friel, C. T.; Radford, S. E.; Imperiali, B. *J. Am. Chem. Soc.* **2005**, *127*, 12882-12889. PMID: PMC1356972.
114. "In vitro Assembly of the Undecaprenylpyrophosphate-Linked Heptasaccharide for Prokaryotic N-linked Glycosylation" Glover, K. J.; Weerapana, E.; Imperiali, B. *Proc. Natl. Acad. Sci. USA*, **2005**, *102*, 14255-14259. PMID: PMC1242339.
115. "Investigating Bacterial N-linked Glycosylation: Synthesis and Glycosyl Acceptor Activity of Undecaprenylpyrophosphate-linked Bacillosamine" Weerapana, E.; Glover, K. J.; Chen, M. M.; Imperiali, B. *J. Am. Chem. Soc.* **2005**, *127*, 13766-13767. PMID: PMC1351108.
116. "Rapid Combinatorial Screening of Peptide Libraries for the Selection of Lanthanide-Binding Tags (LBTs)" Martin, L. J.; Sculimbrene, B. R.; Nitz, M.; Imperiali, B. *QSAR Comb. Sci.* **2005**, *10*, 1149-1157.
117. "Chemoenzymatic Synthesis of Glycopeptides using PglB, a Bacterial Oligosaccharyl Transferase from *Campylobacter jejuni*" Glover, K. J.; Weerapana, E.; Shin, N.; Imperiali, B. *Chemistry & Biology* **2005**, *12*, 1311-1316. PMID: PMC2519243.
118. "Asparagine-linked Protein Glycosylation: From Eukaryotic to Prokaryotic Systems" Weerapana, E.; Imperiali, B. *Glycobiology*, **2006**, *16*, 91R-101R.
119. "Optimal Sox-based Fluorescence Chemosensor Design for Serine/Threonine Protein Kinases" Shults, M. D.; Carrico-Moniz, D.; Imperiali, B. *Analytical Biochem.* **2006**, *352*, 198-207.
120. "Expression of N-Terminal Cys-Protein Fragments using an Intein Refolding Strategy" Hackenberger, C. P. R.; Chen, M. M.; Imperiali, B. *Bioorg. Med. Chem.* **2006**, *14*, 5043-5048.
121. "Direct Biochemical Evidence for the Utilization of UDP-Bacillosamine by PglC, an Essential Glycosyl-1-phosphate-transferase in the *C. jejuni* N-linked Glycosylation Pathway" Glover, K. J.; Weerapana, E.; Chen, M. M.; Imperiali, B. *Biochemistry*, **2006**, *45*, 5343-5350.
122. "Lanthanide Binding Tags as Luminescent Probes for Studying Protein Interactions" Sculimbrene, B. R.; Imperiali, B. *J. Am. Chem. Soc.* **2006**, *128*, 7346-7352.
123. "In vitro Evidence for the Dual Function of Alg2 and Alg11: Essential Mannosyltransferases in N-linked Glycoprotein Biosynthesis" O'Reilly, M. K.; Zhang, G.; Imperiali, B. *Biochemistry*, **2006**, *45*, 9593-9603.
124. "In vitro biosynthesis of UDP-N,N'-diacetyl bacillosamine by Enzymes of the *Campylobacter jejuni* General Protein Glycosylation System" Olivier, N. B.; Chen, M. M.; Behr, J. R.; Imperiali, B. *Biochemistry* **2006**, *45*, 13659-13669. PMID: PMC2542654.
125. "Semisynthesis of Unnatural Amino Acid Mutants of Paxillin: Protein Probes for Cell Migration Studies" Vogel, E. M.; Imperiali, B. *Protein Science* **2007**, *16*, 550-556. PMID: PMC2203312.

126. "Fluorogenic Probes for Monitoring Peptide Binding to Class II MHC Proteins in Living Cells" Venkatraman, P.; Nguyen, T.; Sainlos, M. Bilsel, O. Calvo-Calle, Chitta, M. S. Imperiali, B.; Stern, L. J. *Nature Chemical Biology* **2007**, *3*, 222-228.
127. "From Peptide to Protein: Comparative Analysis of the Substrate Specificity of N-Linked Glycosylation in *C. jejuni*" Chen, M. M.; Glover, K. J.; Imperiali, B. *Biochemistry*, **2007**, *46*, 5579-5585.
128. "Caged O-Phosphorothioyl Amino Acids as Building Blocks for Fmoc-based Solid Phase Peptide Synthesis" Aemissegger, A.; Carrigan, C. N.; Imperiali, B. *Tetrahedron*, **2007**, *63*, 6185-6190. PMID: PMC2699315
129. "Double Lanthanide-Binding Tags: Design, Photophysical Properties and NMR Applications" Martin, L. J.; Hähnke, M. J.; Nitz, M.; Wöhnert, J.; Silvaggi, N. J.; Allen, K. N.; Schwalbe, H.; Imperiali, B. *J. Am. Chem. Soc.* **2007**, *129*, 7106-7113.
130. "Double Lanthanide-Binding Tags for Macromolecular Crystallographic Structure Determination" Silvaggi, N. J.; Martin, L. J.; Schwalbe, H.; Imperiali, B.; Allen, K. N. *J. Am. Chem. Soc.* **2007**, *129*, 7114-7120.
131. "Tools for Investigating Peptide-Protein Interactions: Peptide Incorporation of Environment-Sensitive Fluorophores via on Resin Derivatization" Sainlos, M.; Imperiali, B. *Nature Protocols* **2007**, *2*, 3201-3209.
132. "Tools for Investigating Peptide-Protein Interactions: Peptide Incorporation of Environment-Sensitive Fluorophores through SPPS-based 'Building Block' Approach" Sainlos, M.; Imperiali, B. *Nature Protocols*, **2007**, *2*, 3210-3218.
133. "Synthesis of Anhydride Precursors of the Environment-Sensitive Fluorophores 4-DMAP and 6-DMN" Sainlos, M.; Imperiali, B. *Nature Protocols*, **2007**, *2*, 3219-3225.
134. "Polyisoprene Specificity in the *Campylobacter jejuni* N-linked Glycosylation Pathway" Chen, M. M.; Weerapana, E.; Ciepichal, E.; Stupak, J.; Reid, C. W.; Swiezewska, E.; Imperiali, B. *Biochemistry*, **2007**, *46*, 14342-14348. PMID: PMC2585822.
135. "Lanthanide-Binding Tags with Unnatural Amino Acids: Sensitizing Tb³⁺ and Eu³⁺ Luminescence at Longer Wavelengths" Reynolds, A. M.; Sculimbrene, B. R.; Imperiali, B. *Bioconjugate Chem.* **2008**, *19*, 588-591.
136. "Chemoenzymatic Synthesis of Polyprenyl Phosphates" Hartley, M. D.; Larkin, A.; Imperiali, B. *Bioorg. Med. Chem.* **2008**, *16*, 5149-5156. PMID: PMC2471869.
137. "Solution Structure of Alg13: The Sugar Donor Subunit of a Yeast N-Acetylglucosamine Transferase" Wang, X.; Weldeghorghis, T.; Zhang, G.; Imperiali, B.; Prestegard, J. H. *Structure*, **2008**, *16*, 965-975. PMID: PMC2486831.
138. "Structure Determination of a Galectin-3 – Carbohydrate Complex Using Paramagnetism-based NMR Constraints" Zhuang, T.; Lee, H-S.; Imperiali, B.; Prestegard, J. H. *Protein Science*, **2008**, *17*, 1220-1231. PMID: PMC2442008.
139. "Affinity-Capture Tandem Mass Spectrometric Characterization of Polyprenyl-linked Oligosaccharides: A Novel Tool to Study Protein N-Glycosylation Pathways" Reid, C. W.; Stupak, J.; Chen, M. M.; Imperiali, B.; Li, J.; Szymanski, C. M. *Analytical Chem.* **2008**, *80*, 5468-5475. PMID: PMC2763189.
140. "Crystal Structure and Catalytic Mechanism of PglD from *Campylobacter jejuni*" Olivier, N. B.; Imperiali, B. *J. Biol. Chem.* **2008**, *283*, 27937-27946. PMID: PMC2562079.
141. "Recognition-Domain Focused (RDF) Chemosensors: Versatile and Efficient Reporters of Protein Kinase Activity" Luković, E.; González-Vera, J. A.; Imperiali, B. *J. Am. Chem. Soc.* **2008**, *130*, 12821-12827. PMID: PMC2637182.
142. "A Versatile Amino Acid Analogue of the Solvatochromic Fluorophore 4-N,N-Dimethylamino-1,8-naphthalimide: A Powerful Tool for the Study of Dynamic Protein Interactions" Loving, G. S.; Imperiali, B. *J. Am. Chem. Soc.* **2008**, *130*, 13630-13638. PMID: PMC2647014.
143. "Native Chemical Ligation (NCL): Semisynthesis of Post-Translationally Modified Proteins and Biological Probes" Imperiali, B.; Vogel, E. M., in *Protein Engineering*, Köhler C & RajBhandary UL. (Eds) *Nucleic Acids and Molecular Biology* Vol. 22; pp 65-96, Springer (**2009**).

144. "A Rapid Method for Generation of Selective Sox-based Chemosensors of Ser/Thr Kinases Using Combinatorial Peptide Libraries" González-Vera, J. A.; Luković, E. Imperiali, B. *Bioorg. Med. Chem. Lett.* **2009**, *19*, 1258-1260. PMID: PMC2838374.
145. "*Campylobacter jejuni* PglH is a Single Active Site Processive Polymerase that Utilizes Product Inhibition to Limit Sequential Glycosyl Transfer Reactions" Troutman, J. M.; Imperiali, B. *Biochemistry*, **2009**, *48*, 2807-2816. PMID: PMC2736683.
146. "A General Screening Strategy for Peptide-Based Fluorogenic Ligands: Probes for Dynamic Studies of PDZ Domain-Mediated Interactions", Sainlos, M.; Iskenderian, W. S.; Imperiali, B. *J. Am. Chem. Soc.* **2009**, *131*, 6680-6682. PMID: PMC2828873.
147. "Biosynthesis of UDP-GlcNAc(3NAc)A by WbpB, WbpE, and WbpD: Enzymes in the Wbp Pathway Responsible for O-antigen Assembly in *Pseudomonas aeruginosa* PAO", Larkin, A.; Imperiali, B. *Biochemistry*, **2009**, *48*, 5446-5455. PMID: PMC2694220.
148. "Monitoring Protein Kinases in Cellular Media with Highly Selective Chimeric Reporters", Lukovic, E.; Vogel Taylor, E.; Imperiali, B. *Angew. Chem. Int. Ed.* **2009**, *48*, 6828-6831. PMID: PMC2937354.
149. "Synthesis of Red-shifted 8-Hydroxyquinoline Derivatives Using Click Chemistry and Their Incorporation into Phosphorylation Chemosensors" González-Vera, J. A.; Luković, E. Imperiali, B. *J. Org. Chem.* **2009**, *74*, 7309-7314. PMID: PMC2762270.
150. "Thiol-reactive Derivatives of the Solvatochromic 4-*N,N*-Dimethylamino-1,8-naphthalimide Fluorophore: A Highly Sensitive Toolset for the Detection of Biomolecular Interactions" Loving, G. S. Imperiali, B. *Biocong. Chem.* **2009**, *20*, 2133-2141. PMID: PMC2783863.
151. "Monitoring Protein Interactions and Dynamics with Solvatochromic Fluorophores" Loving, G. S.; Sainlos, M.; Imperiali, B. *Trends Biotechnol.* **2009**, *28*, 73-83. PMID: PMC2818466.
152. "Lanthanide-Tagged Proteins – An Illuminating Partnership" Allen, K. N. Imperiali, B. *Current Opin. Chem. Biol.* **2010**, *14*, 247-254.
153. "Structural Analysis of WbpE from *Pseudomonas aeruginosa* PAO1: A Nucleotide Sugar Aminotransferase Involved in O-antigen Assembly" Larkin, A.; Olivier, N. B.; Imperiali, B. *Biochemistry*, **2010**, *49*, 7227-7237. PMID: PMC2923267.
154. "Modulation of Shank3 PDZ Domain Ligand-Binding by Dimerization" Iskenderian-Epps, W. S.; Imperiali, B. *ChemBioChem*, **2010**, *11*, 1979-1984.
155. "Dynamic and Specific Interaction Between Synaptic NR2-NMDA Receptor and PDZ Proteins" Bard, L.; Sainlos, M.; Bouchet, D.; Cousins, S.; Mikasova, L.; Breillat, C.; Stephenson, F. A.; Imperiali, B.; Choquet, D.; Groc, L. *Proc. Natl. Acad. Sci. USA* **2010**, *107*, 19561-19566. PMID: PMC2984211.
156. "Development of a Multicomponent Kinetic Assay for the Early Enzymes in the *Campylobacter jejuni* N-Linked Glycosylation Pathway" Morrison, J. P.; Troutman, J. M.; and Imperiali, B. *Bioorg. Med. Chem.* **2010**, *18*, 8167-8171. PMID: PMC2981441.
157. "Perturbing the Folding Energy Landscape of the Bacterial Immunity Protein Im7 by Site-Specific N-Linked Glycosylation" Chen, M. M.; Bartlett, A. I.; Nerenberg, P. S.; Friel, C. T.; Hackenberger, C. P. R.; Stultz, C. M.; Radford, S. E.; Imperiali, B. *Proc. Natl. Acad. Sci. USA*, **2010**, *107*, 22528-22533. PMID: PMC3012502.
158. "A p38 α -Selective Chemosensor for use in Unfractionated Cell Lysates" Stains, C. I.; Luković, E.; Imperiali, B. *ACS Chemical Biology*, **2011**, *6*, 101-105. PMID: PMC3025060.
159. "Biomimetic Divalent Ligands for the Acute Disruption of Synaptic AMPAR Stabilization" Sainlos, M.; Tigaret, C.; Poujol, C.; Olivier, N. B.; Bard, L.; Breillat, C.; Thiolon, K.; Choquet, D.; Imperiali, B. *Nature Chemical Biology*, **2011**, *7*, 81-91. HFSP funded - PMID 21186349
160. "Engineering Encodable Lanthanide Binding Tags (LBTs) into Loop Regions of Proteins" Barthelmes, K.; Reynolds, A. M.; Peisach, E.; Jonker, H.; Allen, K. N.; Imperiali, B.; Schwalbe, H. *J. Am. Chem. Soc.* **2011**, *133*, 808-819. PMID: PMC3043167.
161. "Light-Triggered Myosin Activation for Probing Dynamic Cellular Processes" Goguen, B. N.; Hoffman, B. D.; Sellers, J. R.; Schwartz, M. A.; Imperiali, B. *Angew. Chem. Int. Ed.* **2011**, *50*, 5667-5670. PMID: PMC3406609.

162. "Biochemical Characterization of the O-linked Glycosylation Pathway in *Neisseria gonorrhoeae* Responsible for Biosynthesis of Pilin Glycans Containing *N,N'*-Diacetylbacillosamine" Hartley, M. D.; Morrison, M. J.; Aas, F. E.; Børud, B.; Koomey, M.; Imperiali, B. *Biochemistry*, **2011**, *50*, 4936-4948. PMID: PMC3108506.
163. "Development of a Fluorogenic Sensor for Activated Cdc42" Goguen, B. N.; Loving, G. S.; Imperiali, B. *Bioorg. Med. Chem. Lett.* **2011**, *21*, 5058-5061. PMID: PMC3156282.
164. "The Expanding Horizons of Asparagine-Linked Glycosylation" Larkin, A.; Imperiali, B. *Biochemistry*, **2011**, *50*, 4411-4426. PMID: PMC3101296.
165. "Genetic and Molecular Analyses Reveal an Evolutionary Trajectory for Glycan Synthesis in a Bacterial Protein Glycosylation System" Børud, B.; Viburiene, R.; Hartley, M. D.; Paulsen, B. S.; Egge-Jacobsen, W.; Imperiali, B.; Koomey, M. *Proc. Natl. Acad. Sci. USA*, **2011**, *108*, 9643-9648. PMID: PMC3111294.
166. "Sequential Activation and Deactivation of Protein Function Using Spectrally Differentiated Caged Phosphoamino Acids" Goguen, B. N.; Aemissegger, A.; Imperiali, B. *J. Am. Chem. Soc.* **2011**, *133*, 11038-11041. PMID: PMC3146339.
167. "Exploiting Topological Constraints to Reveal Buried Sequence Motifs in the Membrane-Bound *N*-Linked Oligosaccharyl Transferases" Jaffee, M. B.; Imperiali, B. *Biochemistry*, **2011**, *50*, 7557-7567. PMID: PMC3164389.
168. "Chemical Tools for Studying Directed Cell Migration" Goguen, B. N. Imperiali, B. *ACS Chemical Biology*, **2011**, *6*, 1164-1174. PMID: PMC3220797.
169. "At the Membrane Frontier: A Prospectus on the Remarkable Evolutionary Conservation of Polyprenols and Polyprenyl-phosphates" Hartley, M. D.; Imperiali, B. *Arch. Biochem. Biophys.* **2012**, *517*, 83-97. PMID: PMC3253937.
170. "Interrogating Signaling Nodes Involved in Cellular Transformations Using Kinase Activity Probes" Stains, C. I.; Tedford, N. C.; Walkup, T. C.; Luković, E.; Goguen, B. N.; Griffith, L. G.; Lauffenburger, D. A.; Imperiali, B. *Chemistry & Biology* **2012**, *19*, 210-217. PMID: PMC3307342.
171. "Tailoring Encodable Lanthanide-Binding Tags as MRI Contrast Agents" Daughtry, K. D.; Martin, L. M.; Sarraju, A.; Imperiali, B.; Allen, K. N. *ChemBioChem* **2012**, *13*, 2567-2574.
172. "FRET-CAPTURE: A Sensitive Method for the Detection of Dynamic Protein Interactions" Socher, E.; Imperiali, B., *ChemBioChem* **2013**, *14*, 53-57. PMID: PMC3776414.
173. "Caged Mono- and Divalent Ligands for Light-Assisted Disruption of PDZ Domain-Mediated Interactions", Sainlos, M.; Iskenderian-Epps, W. S.; Olivier, N. B.; Choquet, D.; Imperiali, B. *J. Am. Chem. Soc.* **2013**, *135*, 4580-4583.
174. "Fluorescent Amino Acids: Modular Building Blocks for the Assembly of New Tools for Chemical Biology" Krueger, A. T.; Imperiali, B. *ChemBioChem* **2013**, *14*, 788-799.
175. "Optimized Protocol for Expression and Purification of PglB the Membrane-Bound Bacterial Oligosaccharyl Transferase", Jaffe, M. B.; Imperiali, B. *Protein Exp. Purif.* **2013**, *89*, 241-250. PMID: PMC3690457.
176. "Biochemical Evidence for an Alternate Pathway in *N*-linked Glycoprotein Biosynthesis", Larkin, A.; Chang, M. M.; Whitworth, G. E.; Imperiali, B. *Nat. Chem. Biol.* **2013**, *9*, 367-373. PMID: PMC3661703.
177. "Biosynthesis of UDP-*N,N'*-Diacetylbacillosamine in *Acinetobacter baumannii*: Biochemical Characterization and Correlation to Existing Pathways" Morrison, M. J.; Imperiali, B. *Arch. Biochem. Biophys.* **2013**, *536*, 72-80. PMID: PMC3722612.
178. "Biochemical Analysis and Structure Determination of Bacterial Acetyltransferases Responsible for the Biosynthesis of UDP-*N,N'*-Diacetylbacillosamine" Morrison, M. J.; Imperiali, B. *J. Biol. Chem.* **2013**, *288*, 32248-32260. PMID: PMC3820863.
179. "Lipid Bilayer Nanodisc Platform for Investigating Polyprenol-Dependent Enzyme Interactions and Activities" Hartley, M. D.; Schneggenburger, P. E. Imperiali, B. *Proc. Natl. Acad. Sci. USA*. **2013**, *110*, 20863-20870. PMID: PMC3876266.

180. "Two-Photon Fluorescence Spectroscopy and Imaging of 4-Dimethylaminonaphthalimide-Peptide and Protein Conjugates" McLean, A. M.; Socher, E.; Clark, T. B.; Imperiali, B.; Goodson, T. III, *J. Phys. Chem.* **2013**, *117*, 15935-15942. PMID: PMC3938489.
181. "The Renaissance of Bacillosamine and its Derivatives: Pathway Characterization and Implications in Pathogenicity" Morrison, M. J. Imperiali, B. *Biochemistry*, **2014**, *53*, 624-638. PMID: PMC3951908.
182. "Equilibrium and Dynamic Design Principles for Binding Molecules Engineered for Reagentless Biosensors" de Picciotto, S.; Imperiali, B.; Griffith, L. G.; Wittrup, K. D. *Analytical Biochem.* **2014**, *460*, 9-15. PMID: PMC4104283
183. "Selective Mitogen Activated Protein Kinase Activity Sensors through the Application of Directionally-Programmable D Domain Motifs" Peterson, L. B.; Yaffe, M. B.; Imperiali, B. *Biochemistry* **2014**, *53*, 5771-5778. PMID: PMC4165445
184. "Quantification of Protein Kinase Enzymatic Activity in Unfractionated Cell Lysates Using CSox-Based Sensors" Beck, J. R.; Peterson, L. B.; Imperiali, B.; Stains, C. I. *Curr. Protoc. Chem. Biol.* **2014**, *6*, 135-156. PMID: PMC4174361
185. "Tailoring Chimeric Ligands for Studying and Biasing ErbB Receptor Family Interactions" Krueger, A. T.; Kroll, C.; Sanchez, E.; Griffith, L. G.; Imperiali, B. *Angew. Chem. Int. Ed.* **2014**, *53*, 2662-2666. PMID: PMC4018821
186. Peterson, L. B.; Imperiali, B. (2014) Real-Time and Continuous Sensors of Protein Kinase Activity Utilizing Chelation-Enhanced Fluorescence. Book chapter in "Concepts and Case Studies in Chemical Biology", (Edited by H. Waldmann and P. Janning), ISBN: 978-3-527-33611-1.
187. Martin, L. J.; Imperiali, B. (2015) The Best and the Brightest: Exploiting Tryptophan-Sensitized Tb³⁺ Luminescence to Engineer Lanthanide-Binding Tags. Book chapter in "Peptide Libraries" Methods in Molecular Biology, (Edited by R. Derda and J. Walker), vol.1248, ISBN 978-1-4939-2019-8
188. "Selective Biochemical Labeling of *Campylobacter jejuni* Cell-Surface Glycoconjugates" Whitworth, G.; Imperiali, B. *Glycobiology* **2015**, *25*, 756-766. PMID: PMC25761366
189. "N-Linked Glycans are Assembled on Highly Reduced Dolichol Phosphate Carriers in the Hyperthermophilic Archaea *Pyrococcus furiosus*", Chang, M. M; Imperiali, B.; Eichler, J; Guan, Z. *Plos One* **2015** *10* 6 e0130482. PMID: PMC4476749
190. "Covalent Modification Of Synthetic Hydrogels With Bioactive Proteins Via Sortase-Mediated Ligation", Cambria, E.; Renggli, K.; Ahrens, C. C.; Cook, C. D.; Kroll, C.; Krueger, A. T.; Imperiali, B.; Griffith, L. G. *Biomacromolecules*, **2015**, *16*, 2316-2326. PMID: PMC4613866
191. "Encoded Loop-Lanthanide-Binding Tags for Long-Range Distance Measurements in Proteins by NMR and EPR Spectroscopy", Barthelmes, D.; Gränz, M.; Barthelmes, K.; Allen, K. N.; Imperiali, B.; Prisner, T.; Schwalbe, H. *J. Biomol. NMR* **2015**, *63*, 275-282.
192. "Chemoenzymatic Assembly of Bacterial Glycoconjugates for Site-Specific Orthogonal Labeling", Lukose, V; Whitworth, G; Guan, Z.; Imperiali, B. *J. Am. Chem. Soc.* **2015**, *137*, 12446-12449. PMID: PMC4599313.
193. "Conservation and Covariance in Monotopic Phosphoglycosyltransferases Identifies the Functional Catalytic Core" Lukose, V.; Luo, L.; Kozakov, D.; Vajda, S.; Allen, K. N.; Imperiali, B. *Biochemistry*, **2015**, *54*, 7326-7234. PMID: PMC5483379.
194. "A Modular Approach to Phosphoglycosyl Transferase Inhibitors Inspired by Nucleoside Antibiotics" Walvoort, M. T. C.; Lukose, V.; Imperiali, B. *Chem. Eur. J.* **2016**, *22*, 3856-3864. PMID: PMC5506376.
195. "Probing Polytopic Membrane Protein - Substrate Interactions by Luminescence Resonance Energy Transfer", Musial-Siwiek, M.; Jaffee, M. B.; Imperiali, B. *J. Am. Chem. Soc.* **2016**, *138*, 3806-3812. PMID: PMC5480290.
196. "Design Principles for SuCESsFul Biosensors: Specific Fluorophore/Analyte Binding and Minimization of Fluorophore/Scaffold Interactions". de Picciotto, S.; Dickson, P. M.; Traxlmayr, M. W.; Marques, B. S.; Socher, E.; Zhao, S.; Cheung, S.; Kiefer, J.; Griffith, L. G.; Wand, A. J.; Imperiali, B.; Wittrup, K. D. *J. Mol. Biol.* **2016**, *428*, 2228-2241. PMID: PMC5048519.

197. "A Rapid and Efficient Luminescence-based Method for Assaying Phosphoglycosyltransferase Enzymes" Das, D.; Walvoort, M. T. C.; Lukose, V.; Imperiali, B. *Scientific Reports*, **2016**, 6, 33412. PMID: PMC5022061.
198. "Bacterial N-Glycosylation Efficiency is Dependent on the Structural Context of Target Sequons" Silverman, J. M.; Imperiali, B. *J. Biol. Chem.* **2016**, 291, 22001-22010. PMID: PMC5063983.
199. "Antibodies from Multiple Sclerosis Patients Preferentially Recognize Hyperglucosylated Adhesin of Non-Typeable *Haemophilus influenzae*", Walvoort, M. T. C.; Testa, C.; Eilam, R.; Aharoni, R.; Nuti, F.; Rossi, G.; Real-Fernandez, R.; Lanzillo, R.; Morra, V. B.; Lolli, F.; Rovero, P.; Imperiali, B.; Papini, A-M. *Scientific Reports*, **2016**, 6, 39430. PMID: PMC5180199.
200. "Conformational Dynamics and Alignment Properties of Loop Lanthanide-Binding Tags (LBTs) Studied in Interleukin-1 β ", Schwalbe, H.; Barthelmes, D.; Barthelmes, K.; Schnorr, K.; Hendrik R. A. Jonker; B. B.; Allen, K. N.; Imperiali, B. *J. Biomol. NMR*, **2017**, 68, 187-194.
201. "Analysis of a Dual Domain Phosphoglycosyl Transferase Reveals a Ping-Pong Mechanism with a Covalent Enzyme Intermediate", Das, D.; Kuzmic, P.; Imperiali, B. *Proc. Natl. Acad. Sci. U.S.A.* **2017**, 114, 7019-7024. PMID: PMC5502628.
202. "Bacterial Phosphoglycosyl Transferases: Initiators of Glycan Biosynthesis at the Membrane Interface" Lukose, V.; Walvoort, M. T. C.; Imperiali, B. *Glycobiology*. **2017**, 27, 820-833. PMID: PMC5881778.
203. "Chemoenzymatic Synthesis and Applications of Prokaryote-Specific UDP-Sugars", Zamora, C. Y.; Schocker, N. S.; Chang, M. M. Imperiali, B. *Meth. Enzymol.* **2017**, 597, 145-186. PMID: PMC6710627.
204. "Stereochemical Divergence of Polyprenol Phosphate Glycosyltransferases" Eichler, J.; Imperiali, B. *Trends Biochem. Sci.* **2018**, 43, 9-16. PMID: PMC5741494.
205. "Biogenesis of Asparagine-Linked Glycoproteins Across Domains of Life: Similarities and Differences" Eichler, J.; Imperiali, B. *ACS Chem. Biol.* **2018**, 13, 833-837. PMID: PMC6338551.
206. "Membrane Association of Monotopic Phosphoglycosyl Transferase Underpins Function" Ray, L. C.; Das, D.; Entova, S.; Lukose, V.; Lynch, A. J.; Imperiali, B.; Allen, K. N. *Nature Chem. Biol.* **2018**, 14, 538-541. PMID: PMC6202225
207. "Design, Solid-Phase Synthesis and Evaluation of Enterobactin Analogs for Iron Delivery into the Human Pathogen *Campylobacter jejuni*" Cristina Y. Zamora, C.Y.; Madec, A.; Neumann, W.; Nolan, E.M.; Imperiali, B., *Bioorg. Med. Chem.* **2018**, 26, 5314-5321. PMID: PMC6191362.
208. "Facile Solid-Phase Synthesis and Assessment of Nucleoside Analogs as Inhibitors of Bacterial UDP-Sugar Processing Enzymes" Madec, A. G. M.; Schocker, N. S.; Sanchini, S.; Myratgeldiyev, G.; Das, D.; Imperiali, B. *ACS Chem. Biol.* **2018**, 13, 2542-2550. PMID: PMC6457116
209. "Insights into the Key Determinants of Membrane Protein Topology Enable the Identification of New Monotopic Folds" Entova, S.; Billod, J-M.; Swiecicki, J.M.; Martín-Santamaría, S.; Imperiali, B. *eLife*, **2018**: e40889. PMID: PMC6133551.
210. "Monotopic Membrane Proteins Join the Fold" Allen, K.N.; Entova, S.E.; Ray, L.C.; Imperiali, B., *Trends Biochem. Sci.* **2019**, 44, 7-20. PMID: PMC6309722.
211. "Structural and Mechanistic Themes in Glycoconjugate Biosynthesis at Membrane Interfaces" Allen, K. N.; Imperiali, B. *Curr. Opin. Struct. Biol.* **2019**, 59, 81-90. PMID: PMC6885101
212. "Bacterial Carbohydrate Diversity – A Brave New World" Imperiali, B. *Curr. Opin. Chem. Biol.* **2019**, 53, 1-8. PMID: PMC6893104.
213. "Investigation of the Conserved Reentrant Membrane Helix in the Monotopic Phosphoglycosyl Transferase Superfamily Supports Key Molecular Interactions with Polyprenol Phosphate Substrates" Entova, S. E.; Guan, Z.; Imperiali, B. *Arch. Biochem. Biophys.* **2019**, 675, 10811. PMID: PMC6909930
214. "Deploying Fluorescent Nucleoside Analogs for High Throughput Inhibitor Screening" Seebald, L.; Madec, A.; Imperiali, B. *ChemBioChem* **2020**, 21, 108-112. PMID: PMC6980326
215. "A Strategic Approach for Fluorescence Imaging of Membrane Proteins in a Native-Like Environment" Swiecicki, J-M. Santana, J. Imperiali, B. *Cell Chem. Biol.* **2020**, 27, 1-7. PMID: PMC7446765

216. "Application of a Gut-immune Co-culture System for the Study of N-Glycan-Dependent Host-Pathogen Interactions of *Campylobacter jejuni*" Zamora, C. Y.; Ward, E. M.; Kester, J. C.; Chen, W. C. K.; Velazquez, J. G.; Griffith, L. G.; Imperiali, B. *Glycobiology*, **2020**, *30*, 374-381.
217. "Lanthanide-Binding Tags for 3D X-Ray Imaging of Proteins in Cells at Nanoscale Resolution" Victor, T. W.; O'Toole, K. H.; Easthon, L. M.; Ge, M.; Smith, R. J.; Huang, X.; Yan, H.; Chu, Y. S.; Chen, S.; Gursoy, D.; Ralle, M.; Imperiali, B.; Allen, K. N.; Miller, L. M. *J. Am. Chem. Soc.* **2020**, *142*, 2145-2149.
218. "Uridine Natural Products: Challenging Targets and Inspiration for Novel Small Molecule Inhibitors" Arbour, C. A.; Imperiali, B., *Bioorg. Med. Chem.* **2020**, *28*, 115661. PMID: PMC7446765
219. "Glycoconjugate Pathway Connections Revealed by Sequence Similarity Network Analysis of the Monotopic Phosphoglycosyl Transferases" O'Toole, K. H.; Imperiali, B.; Allen, K. N., *Proc. Natl. Acad. Sci. U.S.A.* **2021** e2018289118.
220. "Strategies and Tactics for the Development of Selective Glycan-Binding Proteins" Ward, E. M.; Kizer, M. E.; Imperiali, B. *ACS Chem. Biol.* **2021**, *16*, 1795-1813.
221. "The Surprising Structural and Mechanistic Dichotomy of Membrane-Associated Phosphoglycosyl Transferases" O'Toole, K. H.; Bernstein, H. M.; Allen, K. N.; Imperiali, B. *Biochem. Soc. Trans.* **2021**, *49*, 1189-1203.
222. "Backbone-Anchoring, Solid-Phase Synthesis Strategy to Access a Library of Peptidouridine-Containing Small Molecules" Arbour, C.A.; Imperiali, B. *Org. Lett.* **2022**, *24*, 2170-2174.
223. "Probing Monotopic Phosphoglycosyl Transferases from Complex Cellular Milieu" Anderson, A.J.; Seebald, L.M.; Arbour, C.A.; Imperiali, B. **2022** Submitted for publication.
224. "Engineered Glycan-Binding Proteins for Recognition of the TF Antigen and Diverse Hexose Disaccharides" Ward, E.M.; Zamora, C.Y.; Imperiali, B. **2022** Submitted for publication.
225. "Synergistic Computational and Experimental Studies on a Phosphoglycosyl Transferase Membrane/Ligand Ensemble" Majumder, A.; Vuksanovic, N.; Ray, L.C.; Bernstein, H.M.; Allen, K.N.; Imperiali, B.; Straub, J.E. **2022** Submitted for publication.
226. "Human Oral Lectin ZG16B Acts as a Peptidoglycan Probe to Decode Host-Microbe Interactions with Oral Commensals" Ghosh, S.; Ahearn, C.; Isabella, C.R.; Marando, V.M.; Dodge, G.J.; Bartlett, H.; McPherson, R.L.; Dugan, A.; Jain, S.; Tettelin, H.; Ruhl, S.; Kiessling, L.L.; Imperiali, B. **2022** Submitted for publication.

Books:

Methods in Enzymology, Volume 597 – Chemical Glycobiology Part A. Synthesis, Manipulation and Applications of Glycans. Edited by Barbara Imperiali. Academic Press, ISBN 978-0-12-811469-8.

Methods in Enzymology, Volume 598 – Chemical Glycobiology Part B. Monitoring Glycans and their Interactions. Edited by Barbara Imperiali. Academic Press, ISBN 978-0-12-814419-0

Patents:

"Peptidyl Inhibitors of Oligosaccharyl Transferase," U.S. Patent Application, No. 5,994,502. Issued Nov. 30, 1999. Imperiali, B.; Spencer, J.R.; Hendrickson, T.L.

"Peptidyl Fluorescent Chemosensor for Divalent Zinc," U.S. Patent No. 5,928,955. Issued July 27, 1997. Imperiali, B.; Walkup, G.K.

"Peptidyl Fluorescent Chemosensor for Divalent Zinc," P.C.T Patent Application, Serial No. PCT/US97/04672 filed March 21, 1997, Imperiali, B.; Walkup, G.K.

"Method for Screening Peptides for Metal Coordinating Properties and Fluorescent Chemosensors Derived Therefrom," Imperiali, B.; Walkup, G.K. U.S. Patent Application, No. 6,083,758. Issued July 4, 2000.

"Lanthanide Binding Tags," Imperiali, B.; Allen, K.N.; Franz, K. J., U.S. Patent Application No. 7,101,667. Issued Sept 5, 2006.

"Lanthanide Binding Tags," Imperiali, B.; Allen, K.N.; Franz, K.J., P.C.T Patent Application, Serial No. PCT/US02/28201 filed September 5, 2002, nationalized into EPO.

#"Fluorescence Assay for Kinase Activity" Imperiali, B.; Shults, M.D., U.S. Patent No. 6,906,194. Issued June 14, 2005.

#"Fluorescence Assay for Kinase Activity" Imperiali, B.; Shults, M.D., P.C.T Patent Application, filed October 5, 2004, nationalized into EPO and JP.

"Fluorescent Probes for Biological Studies" Imperiali, B.; Vazquez, M.E., U.S. Patent No. 7,442,529. Issued October 28, 2008.

#"Sox-based Kinase Sensor" Imperiali, B.; Lukovic, E.; Carrico-Moniz, D. U.S. Patent No. 7,964,729. Issued June 21, 2011.

#"Environmentally Sensitive Fluorophores", Imperiali, B.; Loving, G.S. U.S. Patent No. 8,440,835. May 14, 2013.

"Environmentally Sensitive Fluorophores", Imperiali, B.; Loving, G.S. P.C.T. Application PCT/US2008/002485. Filed 26 February, 2008.

#"Sox-based Kinase Sensor" Imperiali, B.; Lukovic, E.; Carrico-Moniz, D. P.C.T. Patent PCT/US2007/076959 published October 7, 2008.

#"Heterocycle-Modified Quinolines for Fluorescence-Based Protein Kinase Sensing", Gonzalez Vera, J. A.; Lukovic, E.; Imperiali, B. Application filed: August 31, 2010.

"Method of Dissolving and Preparing Extracellular Matrix Gels On Demand", Griffith, L. G.; Imperiali, B.; Cook, C. D.; Chopko, C. M.; Renggli, K.; Valdez Macías, J. L. Application filed: January 12, 2015.

#"Kinase and/or Phosphatase Sensing via Hydroxyquinoline-Sensitized Chelates", Imperiali, B. et al. Application filed: March 12, 2019. U.S. Application No.: 16/299.976.

"Glycan-Binding Proteins and Related Compositions and Methods" Inventor(s): Barbara Imperiali et al. Publication No.: US-2020-0362000-A1 US Patent Application No.: 16/818,827. Application filed: March 13, 2020

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