Peng Wu Ph.D.

Department of Biochemistry
Albert Einstein College of Medicine
Price Center for Genetics and Translational Medicine, Room 522
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Education

B.S. in Chemistry
1995–1999 Department of Chemistry, Peking University, Beijing, P.R. China
M.S. in Chemistry
1999–2001 Department of Chemistry, Indiana University, Bloomington, IN
Advisor: Professor Kenneth G. Caulton
Ph.D. in Chemistry
2001–2005 The Scripps Research Institute, La Jolla, CA
Advisor: Professor K. Barry Sharpless
Postdoctoral Associate
2005–2008 Department of Chemistry, Univ. of California at Berkeley
Advisor: Professor Carolyn R. Bertozzi

Professional Employment

Instructor
2008–2009 Department of Biochemistry, Albert Einstein College of Medicine, Yeshiva University
Assistant Professor
2009–2013 Department of Biochemistry, Albert Einstein College of Medicine, Yeshiva University
Scientific Director, Chemical Biology Core Facility
2011–present Albert Einstein College of Medicine, Yeshiva University
Associate Professor
2013–present Department of Biochemistry, Albert Einstein College of Medicine, Yeshiva University

Awards

1995 1st Award in the National Chemistry Competition (Sichuan Province, China)
1995 2nd Award in the National Chemistry Competition of China
1995 Peking University Freshmen Scholarship
2002–2005 Skaggs Predoctoral Fellowship
2003 Scripps Graduate Student Retreat Award
2006–2007 Howard Hughes Medical Institute Postdoctoral Fellow
2007 MBL Pioneers Scholarship and Herbert W. Rand Fellowship
2007–2012 NIH Pathway to Independence Award
2011–2014 DuPont Young Professor Award
2013 Visiting Fellowship, Pembroke College, University of Oxford, UK
2013 David Y. Gin Young Investigator Award, Division of Carbohydrate Chemistry, American Chemical Society
2014 Kavli Fellow

Services and Professional Membership

2003–present Member, American Chemical Society
2010 Ad Hoc Member, Synthetic and Biological Chemistry A (SBCA), Study Section, NIH
2011 Co-chair for the Glycobiology general paper section, 241st ACS National Meeting, Anaheim

CA, 03/2011

2012 Co-Editor (with Prof. Bertozzi) for the In Vivo Chemistry section of *Current Opinion in Chemical Biology volume 17, issue 5*

2014 Co-Organizer for the Click Chemistry in Biology and Medicine Symposium, New York Academy of Sciences

2015 Co-Editor (with Prof. Boons) for the Chemical Glycobiology special issue of *Glycobiology*

Publications

42. Discovery of Autophagy Inhibitors with Anti-proliferative Activity in Lung and Pancreatic Cancer Cells. Nordstrøm, L.; Sironi, J.; Aranda, E.; Maisonet, J.; Perez-Soler, R.; Wu, P.; Schwartz, E. *ACS Med. Chem. Lett.* **2015**, *6*, 134.

41. Tracking Surface Glycans on Live Cancer Cells with Single Molecule Sensitivity. Jiang, H.; English, B.; Hazan, R.; Wu, P.;* Ovryn, B.* *Angew. Chem. Int. Ed.* **2015**, *93*, 21 (*co-corresponding authors).
    - Highlighted in *C&En News*: "Single Glycoproteins Caught In Motion", **2015**, *93 (1)*, 21.

40. CHoMP: A Chemoenzymatic Histology Method for Glycan Detection Using 'Clickable' Probes. Rouhanifard, S. H.; López-Aguilar, A.; Wu, P. *ChemBioChem*, **2014**, DOI: 10.1002/cbic.201402433

39. The GDP-Fucose Transporter, Slc35c1 is a Negative Feedback Regulator of Wnt Signaling in Zebrafish. Feng, L.; Jiang, H.; Wu, P.*, Marlow, F.L.* *Dev. Biol.* **2014**, *395*, 268 (*co-corresponding authors).

38. Biocompatible Click Chemistry Enabled Compartment-Specific pH Measurement Inside *E. coli*. Yang, M.; Jalloh, A.; Wei, W. Zhao, J.*; Wu. P*; Chen, P.R.* *Nat. Commun.* **2014**, *5*, Article number: 4981; doi:10.1038/ncomms5981 (*co- corresponding authors).
    - Highlighted in *C&En News* **2014**, *92* (39), 30.

37. Monitoring Dynamic Cell-Surface Glycosylation Using Super-sensitive Click Chemistry. Jiang, H.; Zheng, T.; Lopez Aguilar, A.; Kopp, F.; Marlow, F. L.; Wu, P. *Bioconjugate Chem.* **2014**, *25*, 698.

36. In vivo Chemistry. Bertozzi, C. R.; Wu, P. *Curr. Opin. Chem, Biol.* **2013**, *17*, 717.

35. Single-stranded DNA as a Cleavable Linker for Bioorthogonal Click Chemistry-based Proteomics. Zheng, T.; Jiang, H.; Wu, P. *Bioconjugate Chem.* **2013**, *24*, 859.

34. Chemical Probing of Glycans in Cells and Organisms. Rouhanifard, S. H.; Nordstrom, L. U.; Zheng, T.; Wu, P. *Chem. Soc. Rev.* **2013**, *42*, 4284.

33. Detection and Isolation of Dendritic Cells Using Lewis X-functionalized Magnetic Nanoparticles. Rouhanifard, S. H.; Xie, R.; Zhang, G.; Sun, X.; Chen, X.; Wu, P. *Biomacromolecules*. **2012**, *13*, 3039.

32. Click Triazoles for Bioconjugation. Zheng, T.; Rouhanifard S.H.; Jalloh A. S.; Wu P. *Top. Heterocycl. Chem.* **2012,** *28*,163.

31. Metabolomic Analysis of Patient Plasma Yields Evidence of Plant-Like α-Linolenic Acid Metabolism in Plasmodium falciparum Lakshmanan, V.; Rhee, K. Y.; Wang, W.; Yu, Y.; Khafizov, K.; Fiser, A.; Wu, P.; Ndir, O.; Mboup, S.; Ndiaye, D.; Daily, J. P. *J. Infect. Dis*. **2012**, *206*, 238.

30. Imaging the Glycome in Living Systems. Li, B.; Mock, F.; Wu, P. *Meth. Enzymol.* **2012**, *505*, 401.

29. Sulfated Ligands for the Copper(I)-catalyzed Azide-Alkyne Cycloaddition. Wang, W.; Hong, S.; Tran, A.; Jiang, H.; Triano, R.; Liu, Y. Chen, X.; Wu, P. *Chem. Asian J.* The "Click Chemistry 10 Years" Special Issue**. 2011**, *10*, 2796.

28. Imaging Glycans in Zebrafish Embryos by Metabolic Labeling and Bioorthogonal Click Chemistry. Jiang, H.; Feng, L.; Soriano del Amo, D.; Seidel, R.D. III; Marlow, F. Wu, P. *J. Vis Exp.* **2011**, DOI: 10.3791/2686

27. Raising the Efficacy of Bioorthogonal Click Reactions for Bioconjugation: A Comparative Study. Webler-Besanceney, C.; Jiang, H.; Zheng, T.; Feng, Lei; Soriano Del Amo, D.; Wang, W.; Klivansky, L.; Liu, Y.; Marlow, F.; Wu, P. *Angew. Chem. Int. Ed.* **2011**, *50*, 8051.

26. Metabolic Labeling of Fucosylated Glycoproteins in Bacteroides. Webler-Besanceney, C.; Jiang, H.; Wang, W.; Baughn, A.; Wu, P. *Bioorg. Med. Chem. Lett.* **2011***, 21,* 4989.
    - The special issue in honor of Prof. Carolyn Bertozzi on the occasion of her receiving Tetrahedron Young Investigator Award.

25. Metabolic Labeling of Fucosylated Glycans in Developing Zebrafish. Dehnert, K. W.; Beahm, B. J.; Huynh, T. T.; Baskin, J. M.; Laughlin, S. T.; Wang, W.; Wu, P.; Amacher, S. L.; Bertozzi, C. R. *ACS Chem. Bio.* **2011**, *6*, 547.

24. Tracking N-acetyllactosamine on Cell Surface Glycans in Vivo. Zheng, T.; Jiang, H.; Gros, M., Soriano del Amo, D.; Sundaram, S.; Lauvau, G.; Marlow, F.; Liu, Y., Stanley, P.; Wu, P. *Angew. Chem. Int. Ed.* **2011**, *50*, 4113.

23. Biocompatible Copper(I) Catalysts for in Vivo Imaging of Glycans. Soriano del Amo, D.; Wang, W.; Hao, J.; Besanseney, C.; Yan, A, C.; Levy, M.; Liu, Y.; Marlow, F. Wu, P. *J. Am. Chem. Soc.* **2010**, *132*, 16893.
    - Highlighted in *C&En News,* **2010**, *88 (48)*, 37.

22. Chemoenzymatic Synthesis of the Sialyl Lewis X Glycan and its Derivatives. Soriano Del Amo, D; Wang, W; Besanceney, C; Zheng, T; He, Y; Gerwe, B; Seidel, RD III, Wu, P. *Carbohydr. Res.* **2010**, *345*, 1107.

21. Chemoenzymatic Synthesis of GDP-L-fucose and the Lewis X Glycan Derivatives. Wang, W.; Hu, T.; Frantom, P. A.; Zheng, T; Gerwe, B.; Soriano del Amo, D.; Seidel, R.D. III; Wu, P. *Proc. Natl. Acad. Sci. USA.* **2009,** *106,* 16096.

20. Probe the Sialic Acid Biosynthetic Pathway Using Alkyne-Bearing Sugars. Chang, P.; Chen, X.; Smyrniotis, C.; Hu, T.; Bertozzi, C. R.; Wu, P. *Angew. Chem. Int. Ed.* **2009**, *48*, 4030.

From Work Conducted Prior to Joining Albert Einstein College of Medicine

19. Targeted Metabolic Labeling of Yeast N-glycans with Unnatural Sugars. Breidenbach, M. A.; Gallagher, J. E. G.; King, D. S.; Smart, B. P.; Wu, P.; Bertozzi, C. R. *Proc. Natl. Acad. Sci. USA.* **2010**, *107*, 3988.

18. Rapid and selective detection of fatty acylated proteins using omega-alkynyl-fatty acids and click chemistry. Yap, M. C.; Kostiuk, M. A.; Martin, D. D.; Perinpanayagam, M. A.; Hak, P. C.; Siddam, A.; Majjigapu, J. R.; Rajaiah, G.; Keller, B. O.; Prescher, J. A.; Wu, P.; Bertozzi, C. R.; Falck, J. R.; Berthiaume, L. G. *J. Lipid Res.* **2010,** *51,* 1566.

17. The glycopeptide preferring polypeptide- GalNAc transferase-10 (ppGalNAc T10), involved in mucin type-O-glycosylation, has a unique GalNAc-O-Ser/Thr binding site in its catalytic domain not found in ppGalNAc T1 or T2. Perrine, C. L.; Ganguli, A; Wu, P.; Bertozzi, C. R. ; Fritz, T.A.; Raman, J.; Tabak, L. A.; Gerken, T. A. *J. Biol. Chem*. **2009**, *284*,20387.

16. Site-specific Chemical Modification of Recombinant Proteins Produced in Mammalian Cells Using the Genetically Encoded Aldehyde Tag. Wu, P.; Shui, W.; Carlson, B.; Hu, N.; Rabuka, D.; Lee, J.; Bertozzi, C. R. *Proc. Natl. Acad. Sci. USA.* **2009**, *106*, 3000.

15. Boron Nitride Nanotubes Are Noncytotoxic and Can Be Functionalized for Interaction with Proteins and Cells. Chen, X. ; Wu, P.; Rousseas, M.; Okawa, D.; Gartner, Z.; Zettl, A; Bertozzi, C. R. *J. Am. Chem. Soc.* **2009**, 131, 890.

14. Biocompatible Carbon Nanotubes Generated by Functionalization with Glycodendrimers. Wu, P.; Chen, X. ; Hu, N.; Tam. U. C.; Blixt, O.; Zettl, A.; Bertozzi, C. R. *Angew. Chem. Int. Ed.* **2008**, *47*, 5022.

13. Role of architecture and molecular weight in the formation of tailor-made ultrathin multilayers using dendritic macromolecules and click chemistry. Vestberg, R.; Malkoch, M. Kade, M.; Wu, P.; Fokin, V. V.; Sharpless, K. B.; Drockenmuller, E; Hawker, C. J. *J. Polym. Sci., Part A: Polym. Chem.* **2007***, 45, 2835.*

12. Catalytic Dipolar Cycloaddition of Azides and Alkynes: Reactivity and Applications. Wu, P.; Fokin, V. V. *Aldrich. Acta.* **2007***, 40,* 7.

11. Osmium Catalyzed Olefin Dihydroxylation and Amino Hydroxylation with Second-Cycle Ligand. Wu, P.; Hilgraf, R.; Fokin, V. V. *Adv. Synth. Catal.* **2006***, 348,* 1079.

10. Aziridines and Epoxides in Click Chemistry. Fokin, V. V.; Wu, P. in *Aziridines and Epoxides in Organic Synthesis*, Yudin, A. K. Ed., Wiley-VCH, New York, **2006**, 443

9. Multivalent, Bifunctional Dendrimers Prepared by Click Chemistry. Wu, P.; Malkoch, M.; Hunt, J. N.; Vestberg, R.; Kaltgrad, E.; Finn, M. G.; Fokin, V. V.; Sharpless, K. B.; Hawker, C. J. *Chem. Comm.* **2005**, 5775.

8. Just Click It: Undergraduate Procedures for the Copper(I)-Catalyzed Formation of 1,2,3-Triazoles from Azides and Terminal Acetylenes. Sharpless, W. D.; Wu, P.; Hansen, T.; Lindberg, J. G. *J. Chem. Educ.* **2005***, 82,* 1833.

7. One Pot Copper(I)-Catalyzed Syntheses of 3,5-Disubstituted Isoxazoles. Hansen, T.; Wu, P.; Fokin, V. V. *J. Org. Chem.* **2005***, 70,* 7761.

6. Structurally Diverse Dendritic Libraries: A Highly Efficient Functionalization Approach Using Click Chemistry. Malkoch, M.; Schleicher, K.; Drockenmuller, E.; Hawker, C. J.; Russell, T. P.; Wu, P.; Fokin, V. V. *Macromolecules.* **2005***, 38,* 3663.

5. Efficiency and Fidelity in a Click Chemistry Route to Triazole Dendrimers via the Cu(I)-Catalyzed Ligation of Azides and Alkynes. Wu, P.; Feldman, A. K.; Nugent, A. K.; Hawker, C. J.; Scheel, A.; Voit, B.; Pyun, J.; Fréchet, J. M. J.; Sharpless, K. B.; Fokin, V.V. *Angew. Chem. Int. Ed.* **2004**, *43*, 3928
   - Highlighted in *C&En News* **2004**, *28*, 5 and **2004**, *51*, 53.

4. New d_4 Dihydrides of Ru(IV) and Os(IV) with π-donor Ligands: $M(H)_2(chelate)(P^iPr_3)_2$ with Chelate = *ortho*-XYC_6H_4 with X, Y = O, NR; R = H or CH_3 Ferrando-Miguel, G.; Wu, P.; Huffman, J. C.; Caulton, K. G. *New J. Chem.* **2005**, *29*, 193.

3. Cu(I) and Cu(II) Complexes of a Pyridine-based Pincer Ligand. Vedernikov, A. N.; Wu, P.; Huffman, J. C.; Caulton, K. G. *Inorg. Chim. Acta*. **2002**, *300*, 103.

2. Intramolecular N-H Insertion of α-Diazocarbonyls Catalyzed by $Cu(acac)_2$: An Efficient Route to Derivatives of 3-Oxoazetidines, 3-Oxopyrrolidines and 3-Oxopiperidines. Wang, J.; Hou, Y.; Wu, P. *J. Chem. Soc. Perkin Trans.1,* **1999**, 2277.

1. Stereoselective Synthesis of Enantiomerically Pure 4,5-Disubstituted Pyrrolidinones from β-Amino Acids. Wang, J.; Hou, Y; Wu, P; Qu, Z.; Chan, A. S. C. *Tetrahedron Asymm.* **1999**, *10*, 4553.

Invited Talks

2009

University of New Mexico.

2010

Young Investigators in Glycoscience Symposium. 239th ACS National Meeting, San Francisco, CA,
Chemical Glycobiology Symposium, New York Academy of Science, New York, NY,
Peking University, Beijing, China

2011

"Click Chemistry Approaches in Carbohydrate Chemistry" Symposium. 241st ACS National Meeting, Anaheim, CA,
Tsinghua University, Beijing, China,
Georgia State University, Atlanta, GA
University of Chicago, Chicago, IL
University of Pittsburg, Pittsburg, PA
University of California, Irvine, CA

2012

University of Oxford, Oxford, UK
University of Nottingham, Nottingham, UK
University of Colorado, Boulder, CO
Bioorganic Gordon Research Conference, Andover, NH
University of North Carolina, Chapel Hill, NC
DuPont, Wilmington, DE
The Scripps Research Institute, Jupiter FL
Hunter College, New York, NY, 11/2012
Lawrence Berkeley National Laboratory, Berkeley CA
University of California, San Francisco, CA

2013

NIH Workshop on Bioactive Glycans in Human Milk, Bethesda, MD
"Isbell Award and Gin New Investigator Award Symposium", 245th ACS National Meeting, New Orleans, LA
Brooklyn College, Brooklyn, NY
Memorial Sloan-Kettering Cancer Center, New York, NY
Transatlantic Frontiers of Chemistry, Kloster Seon, Germany
"Current Topics in Glycobiology Symposium", 246th ACS National Meeting, Indianapolis

University of Victoria, Victoria, Canada
Simon Fraser University, Burnaby, Canada
The University of British Columbia, Vancouver, Canada

2014

University of Georgia, Athens, GA
"Young Investigator in Glycoscience Symposium", 247th ACS National Meeting, Dallas, TX
"Young Investigators in Biological Chemistry Symposium", 247th ACS National Meeting, Dallas, TX,
Institute of Microbiology, Chinese Academy of Sciences, Beijing, China
Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, China
Soochow University, Suzhou, China,
Consortium of Functional Glycomics Workshop on Exploring the Frontiers of Chemical Glycoscience, Bethesda, MD
Peking University, Beijing, China,
2014 Chinese-American Kavli Frontiers of Science Symposium, Beijing, China
University of California, San Diego, CA
National Cancer Institute, Bethesda, MD

2015
The Scripps Research Institute, La Jolla, CA
DuPont, Wilmington, DE
Stony Brook University, Stony Brook, NY
Cornell University, Ithaca, NY
University of Massachusetts Medical School, Worcester, MA
Pacificchem 2015, HA

Patents

6. Methods of Grading Carcinomas. Wu, P.; Rouhanifard, S. Zhneg.T.Submitted

5. Ligands and Methods for Labeling Biomolecules in vivo. Wu, P.; Soriono del Amo, D.; Wang, W.; Marlow F. L. US2011/046700

4. Method for Enzymatically Introducing Formylglycine into Proteins for Use in Site-specific Labeling. Carrico, I. S.; Carlson, B. L.; Bertozzi, C.; Wu, P. PCT Int. Appl. (2008), WO 2008036350 A2 20080327

3. Click Chemistry Route to Triazole Diverse Dendrimers by Copper(I)-Catalyzed Ligation of Azides and Alkynes. Fokin, V.; Sharpless, K. B.; Wu, P.; Feldman, A. K. 2005-US23718 2006005046, 20050630.

2. Method of Using Click Chemistry to Functionalize Dendrimers. Wu, P.; Fokin, V. V.; Sharpless, K. B. 2006-US27924, 2007011967, 20060718.

1. Method for Making Amphiphilic Dendrimers. Wu, P.; Fokin, V. V.; Sharpless, K. B. 2006-US28017, 2007012001, 20060718.

Ongoing Research Support

1. R01GM093282 — Wu, Peng (PI)
9/15/2010–8/31/2015 — NIH/NIGMS
Chemical tools for studying fucosylated glycans

2. R01GM111938 Wu, Peng (contacting PI), Ovryn, Ben (co-PI)
04/15/2015–03/31/2019 NIH/NIGMS
Chemical tools for studying membrane protein glycosylation

3. R21AI101801 Wu, Peng (contacting PI), Kim, Kami (co-PI)
8/12/2013–7/31/2015 NIH/NIAID
Dissecting the roles of protein O-GlcNAcylation in *Toxoplasma gondii*

4. R21CA182330 Levy, Matthew (PI), Wu, Peng (co-investigator)
09/01/2013- 08/31/2016 NIH/NCI
Lectimers: Glycan-anchored scaffold libraries for targeting carbohydrate-binding

5. Contract funding with Adjuvance Inc Wu, Peng (PI)
09/01/2013–08/31/2015
Novel Adjuvant Discovery in Vaccine Therapy

6. Contract funding with Cynapsus Therapeutics Inc Leyh, Thomas (PI), Wu, Peng (co-investigator)
04/15/2015–03/30/2016
From Mechanism to Medicine Controlling Sulfuryl-Transfer In Vivo

Completed Research Support

1. Mizutani Foundation for Glycoscience Research Grant Wu, Peng (PI)
4/01/2010–03/31/2011
Chemoenzymatic synthesis of fucosylated glycans

2. U54-AI057158-06S1Lipkin Almo, Steve (PI), Wu, Peng (co-PI)
9/17/2009–8/31/2011 Northeast Biodefense Center
Genes-to-vaccines: a novel platform for genome-wide T cell epitope discovery

3. R00 GM080585 Wu, Peng (PI)
6/15/2009–5/31/2012 NIH/NIGMS
Applications of click chemistry in glycobiology

4. 5R21AI090473-02 Jacobs, William (contacting PI), Wu, Peng (co-PI)
1/01/2012–5/31/2012 NIH-NIAID
Metabolomic analysis of redox control in Mycobacterium tuberculosis persisters

5. DuPont Young Professor Award Wu, Peng (PI)
11/01/2011–10/31/2014