Michael W. Beck, Ph.D.
Postdoctoral Scholar
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Education:

May 2011 – August 2015	Ph.D., Chemistry, **University of Michigan (UM), Ann Arbor, MI, USA** Advisor: Professor Mi Hee Lim
Aug. 2007 – May 2011	B.S., Chemistry, **Tennessee Technological University (TTU), Cookeville, TN, USA** *Cum Laude* Biochemistry Concentration American Chemical Society Certification

Honors, Awards, and Scholarships:

2018	Poster Award at the Gordon Research Conference on Bioorganic Chemistry
2015	ASBMB 2015 Graduate and Postdoctoral Travel Award
2015	Rackham (UM) Conference Travel Grant Recipient
2014	Best Poster Presentation Award, Second International Symposium for Molecular Neurodegenerative Disease Research
2014	Best Poster Presentation Award, Korean Chemical Society Summer Bioinorganic Chemistry Symposium
2011	Who's Who Among Students in American Universities and Colleges
2011	Distinction in Undergraduate Research
2011	Faculty Senior Achievement Award
2011	Outstanding Senior Award
2010	First Place Poster Presentation in Chemistry Section Award, 120th Meeting of the Tennessee Academy of Science
2010	ACS Undergraduate Chemistry Award in Inorganic Chemistry
2010 – 2011	McDowell-Blankenship Memorial Scholarship
2010 – 2011	Earl McDonald University Academic Service Scholarship
2010	Student Research Award
2009 – 2010	TTU Chemistry Department Scholarship

Research Experience:

July 2015 – Present	**University of Chicago (UC)**, **Chicago, IL, USA** Postdoctoral Scholar Advisor: Professor Bryan Dickinson, Department of Chemistry Project: Development of small molecule fluorescent probes to study "eraser" enzymes of protein post-translational modifications in living systems
May 2011 – June 2015	**University of Michigan (UM)**, **Ann Arbor, MI, USA** PhD Candidate Advisor: Professor Mi Hee Lim, Life Sciences Institute Project: Development of Small Molecules as Chemical Tools for Investigating the Role of Metal–Protein Interactions in Neurodegenerative Diseases

Jan. 2014 – Feb. 2015	**Ulsan National Institute of Science and Technology (UNIST), Ulsan, South Korea** Visiting Research Scholar Advisor: Professor Mi Hee Lim, Department of Chemistry Project: Development of Small Molecules as Chemical Tools for Investigating the Role of Metal–Protein Interactions in Neurodegenerative Diseases
Dec. 2007 – May 2011	**Tennessee Technological University (TTU), Cookeville, TN, USA** Undergraduate Research Assistant Advisor: Professor Edward Lisic, Department of Chemistry Project: Synthesis, Characterization, and Antimicrobial Studies of Cu(II) and Pd(II) Thiosemicarbazone Complexes
June 2010 – Aug. 2010	**Colgate-Palmolive Company, Piscataway, NJ, USA** 2010 Global Research and Development Summer Internship Project: Development of Near-IR Spectroscopy Methods for Analyzing Soap Bar Constituents and Deposition of Active Ingredients on to Skin

Teaching Experience:

Aug. 2013 – Dec. 2013	**University of Michigan (UM), Department of Chemistry, Ann Arbor, MI, USA** Graduate Student Instructor CHEM 211 Honors: Investigations in Chemistry (Laboratory)
Jan. 2013 – May 2013	**University of Michigan (UM), Department of Chemistry, Ann Arbor, MI, USA** Graduate Student Instructor CHEM 211: Investigations in Chemistry (Laboratory)
Aug. 2011 – May 2012, Aug. 2012 – Dec. 2012	**University of Michigan (UM), Department of Chemistry, Ann Arbor, MI, USA** Graduate Student Instructor CHEM 216: Organic Chemistry Synthesis and Characterization of Organic Compounds (Laboratory)

Publications:

1. Qiu, T.; Kathayat, R. S.; Cao, Y.; **Beck, M. W.**; Dickinson, B. C. *Biochemistry* **2017**, *57*, 221. "A Fluorescent Probe with Improved Water Solubility Permits the Analysis of Protein S-Depalmitoylation Activity in Live Cells"

2. **Beck, M. W.**; Derrick, J.S.; Suh, J.-M.; Kim, M.; Korshavn, K. J.; Kerr, R. A.; Cho, W. J.; Larsen, S. D.; Ruotolo, B. T.; Ramamoorthy, A.; Lim, M. H. *ChemMedChem* **2017**, *12*, 1828. "Minor Structural Variations of Small Molecules Tune Regulatory Activities Toward Pathological Factors in Alzheimer's Disease"

3. **Beck, M. W.**; Kathayat, R. S; Cham, C. M.; Chang, E. B.; Dickinson, B. C. *Chem. Sci.* **2017***, 8,* 7588*. "*Michael Addition-Based Probes for Ratiometric Fluorescence Imaging of Protein S-Depalmitoylases in Live Cells and Tissues"

4. **Beck, M. W.**; Derrick, J. S.; Kerr, R. A.; Oh, S. B.; Cho, W. J.; Lee, S. J. C.; Ji, Y.; Han, J.; Tehrani, Z. A.; Suh, N.; Kim, S.; Larsen, S. D.; Kim, K. S.; Lee, J.-Y.; Ruotolo, B. T.; Lim, M. H. *Nature Commun.* **2016***, 7,* 13115*. "*Structure-Mechanism-Based Engineering of Chemical Regulators Targeting Distinct Pathological Factors in Alzheimer's Disease*"*

5. **Beck**, **M. W.**; Oh, S. B.; Kerr, R. A.; Lee, H. J.; Kim, S. H.; Kim, S.; Jang, M.; Ruotolo, B. T.; Lee, J.-Y.; Lim, M. H. *Chem. Sci.*, **2015**, *6*, 1879.
"A Rationally Designed Small Molecule for Identifying an *In Vivo* Link of Metal–Amyloid-β Complexes to the Pathogenesis of Alzheimer's Disease"
*Recommended as "Very Good" on Faculty of 1000 DOI: 10.3410/f.725725194.793509037.

6. **Beck**, **M. W.**; Pithadia, A. S.; DeToma, A. S.; Korshavn, K. J.; Lim, M. H. Chapter 10: Ligand Design to Target and Modulate Metal-Protein Interactions in Neurodegenerative Diseases. In *Ligand Design in Medicinal Inorganic Chemistry* John Wiley & Sons: Chichester, West Sussex, **2014**, pp 256-286.
*Featured in *Angew. Chem. Int. Ed.*, **2015**, *54*, 2324.

7. Liu, Y.; Kochi, A.; Pithadia, A. S.; Lee, S.; Nam, Y.; **Beck, M. W**.; He, X.; Lee, D.; Lim, M. H. *Inorg. Chem.,* **2013***, 52,* 8121.
"Tuning Reactivity of Diphenylpropynone Derivatives with Metal-Associated Amyloid-β Species via Structural Modifications"

8. Pithadia, A. S.; Kochi, A.; Soper, M. T.; **Beck, M. W.**; Liu, Y.; Lee, S.; DeToma, A. S.; Ruotolo, B. T.; Lim, M. H. *Inorg. Chem.* **2012**, *51*, 12959.
"Reactivity of Diphenylpropynone Derivatives Toward Metal-Associated Amyloid-β Species"

Presentations:

1. 2018 Gordon Research Conference on Bioorganic Chemistry, Andover, NH, June 10-15, 2018 (Poster Presentation)
Beck, M. W.; Trotzuk, E. F.; Azizi, S.-A.; Choi, W.; Dickinson, B. C.
"Ratiometric Fluorescent Probes to Interrogate the Regulation of Cell Signaling by Protein *S*-Depalmitoylases"

**Poster Award*

2. The 63rd ASMS Conference on Mass Spectrometry and Allied Topics, St. Louis, MO, May 31, 2015 (Oral Presentation)
Kerr; R. A.; Nam, Y.; **Beck, M. W.**; Lim, M. H.; Ruotolo, B. T.
"Ion Mobility-Mass Spectrometry for Screening Libraries of Rationally-designed Bifunctional Small Molecule Libraries Capable of Chemical and Structural Amyloid Modulation"

3. Oral Dissertation Defense, University of Michigan, Ann Arbor, MI, May 6, 2015 (Oral Presentation)
Beck, M. W.
"Development of Small Molecules as Chemical Tools for Investigating the Role of Metal–Protein Interactions in Neurodegenerative Diseases"

4. Experimental Biology 2015, Boston, MA, March 31, 2015 (Poster Presentation)
Beck, M. W.; Oh, S. B.; Kerr, R. A.; Lee, H. J.; Kim, S. H.; Kim, S.; Jang, M.; Ruotolo, B. T.; Lee, J.-Y.; Lim, M. H.
"Modulation of Metal–Amyloid-β Reactivity by a Rationally Designed Small Molecule for Elucidating the In Vivo Link of Metal–Amyloid-β Complexes to the Pathogenesis of Alzheimer's Disease"

5. The 2nd International Symposium for Molecular Neurodegenerative Disease Research, KAIST, Daejeon, South Korea, August 22, 2014 (Poster Presentation)
Beck, **M. W.**; Oh, S.B.; Kerr, R.; Lee, H. J.; Kim, S. H.; Kim, S.; Jang, M.; Ruotolo, B. T.; Lee, J.-Y.; Lim, M. H.
"Metamorphosizing the Reactivity of Metal–Amyloid-β Complexes to Profile Their Relation to the Pathology of Alzheimer's Disease"

**Awarded best poster presentation*

6. The 2014 Korean Chemical Society Summer Bioinorganic Chemistry Symposium, Suanbo, South Korea, July 11, 2014 (Poster Presentation)
Beck, **M. W.**; Oh, S.B.; Kerr, R.; Lee, H. J.; Kim, S. H.; Kim, S.; Jang, M.; Ruotolo, B. T.; Lee, J.-Y.; Lim, M. H.
"Metamorphosizing the Reactivity of Metal–Amyloid-β Complexes to Profile Their Relation to the Pathology of Alzheimer's Disease"

**Awarded best poster presentation*

7. The 62nd ASMS Conference on Mass Spectrometry and Allied Topics, Baltimore, MD, June 17, 2014 (Oral Presentation)
Kerr, R. A.; Derrick, J. S.; **Beck, M. W.;** Nam, Y.; Ruotolo, B. T.; Lim, M. H.
"Ion Mobility-Mass Spectrometry for Screening Amyloid Formation Inhibitors within Rationally-designed Bifunctional Small Molecule Libraries"

8. Invited Talk to The TTU ACS Student Affiliate Chapter, Cookeville, TN, December 3, 2013 (Oral Presentation)
Beck, M. W.
"Structure-Reactivity Relationship of Diphenylpropynone Derivatives as Bifunctional Chemical Tools to Study Alzheimer's Disease"

9. The 2013 Vaughn Symposium, Ann Arbor, MI, August 8, 2013 (Poster Presentation)
Beck, M. W.; Charon, J. P; Gosh, A.; Lim, M. H.
"Design and Development of Pyridinylmethylamine Derivatives as Chemical Tools to Study the Role of Metal–Amyloid-β Species in Alzheimer's Disease"

10. The 3rd Annual TTU Chemistry Department Distinction in Research Seminar, Cookeville, TN, April 21, 2011 (Oral Presentation)
Beck, M. W.; Reilly, S. W.; Beck, C. N.; Carr, M.; Holcomb, V. L; Ventrice, J.; Swindle, R. L.; Steelman, K; Lisic, E. C.
"Synthesis and Antimicrobial Studies of Acetylpyrazine-Thiosemicarbazone Compounds"

11. The 241st National Meeting of the American Chemical Society, Anaheim, CA, March 28, 2011 (Poster Presentation)
Beck, M. W.; Beck, C. N.; Reilly, S. W.; Carr, M.; Holcomb, V. L; Ventrice, J.; Lisic, E. C.
"Synthesis and Antimicrobial Studies of Acetylpyrazine-Thiosemicarbazone Compounds."

12. The 120th Meeting of the Tennessee Academy of Science, Cookeville, TN, November 19, 2010 (Poster Presentation)
Beck, M. W.; Reilly, S. W.; Swindle, R. L.; Lisic, E. C.
"Synthesis and Biological Studies of Palladium (II) Acetylpyrazine Thiosemicarbazone Complexes"

**Awarded first place poster presentation in chemistry section*

13. The 5th Annual Tennessee Tech University Student Research Day, Cookeville, TN, April 15, 2010 (Poster Presentation)
Beck, M. W.; Reilly, S. W.; Swindle, R. L.; Lisic, E. C.
"Synthesis and Biological Studies of Palladium (II) Acetylpyrazine Thiosemicarbazone Complexes"

14. The 239th National Meeting of the American Chemical Society, San Francisco, CA, March 22, 2010 (Poster Presentation)
Beck, M. W.; Reilly, S. W.; Swindle, R. L.; Lisic, E. C.
"Synthesis and Biological Studies of Palladium (II) Acetylpyrazine Thiosemicarbazone Complexes"

15. The 4th Annual Tennessee Tech University Student Research Day, Cookeville, TN, March 31, 2009 (Poster Presentation)
Beck, M. W.; Steelman, K; and Lisic, E. C.
"Synthesis and Characterization of New Acetylpyrazine Thiosemicarbazones"

16. The 237th National Meeting of the American Chemical Society, Salt Lake City, UT, March 23, 2009 (Poster Presentation)
Beck, M. W.; Steelman, K; Lisic, E. C.
"Synthesis and Characterization of New Acetylpyrazine Thiosemicarbazones"

Techniques:

Rational structure-based design of small molecules, multistep organic and inorganic syntheses, glovebox and Schlenk-line inert atmosphere techniques, ^{1}H and ^{13}C NMR spectroscopy, mass spectrometry, LC-MS, mammalian cell culture, epifluorescence microscopy, gel electrophoresis, Western blotting, dot blotting, UV-Vis spectroscopy, molecular docking (AutoDock Vina), molecular cloning, biological and biochemical assays.