

Curriculum Vitae

Brian Zeglis, Ph.D.

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Scientific Positions

Hunter College, City University of New York (Jan. 2015 - present) New York, NY
Assistant Professor, Department of Chemistry

Memorial Sloan Kettering Cancer Center (Oct. 2015 - present) New York, NY
Assistant Member (Affiliate), Department of Radiology

Weill Cornell Medical College (Mar. 2015 - present) New York, NY
Assistant Professor (Adjunct), Department of Radiology

Memorial Sloan Kettering Cancer Center (Sept. 2009 - Jan. 2015) New York, NY
Postdoctoral Research Fellow

California Institute of Technology (2004-2009) Pasadena, CA
Ph.D., Chemistry June 2010

Yale University (2000-2004) New Haven, CT
B. S., *summa cum laude*, Chemistry May 2004

Awards and Honors

Phi Beta Kappa, early induction, Yale University May 2002
Saybrook College Marshall, Yale University May 2004
Arthur Fleischer Award for Excellence in Chemistry, Yale University May 2004
Society of Radiopharmaceutical Sciences Travel Award August 2011
World Molecular Imaging Society Travel Award Sept. 2012
Finalist, World Molecular Imaging Society Young Investigator Award Sept. 2012
Berson-Yalow Award, Society of Nuclear Medicine June 2013
Editor's Choice Award, Society of Nuclear Medicine June 2014
Alavi Mandell Award, Society of Nuclear Medicine June 2014
CMIIT Young Investigator Award, Society of Nuclear Medicine June 2014
Chief Radiology Laboratory Research Fellow, MSKCC Sept. 2013 - Jan. 2015
William Stewart Travel Award, City University of New York October 2015

Funding Support

National Science Foundation GRFP Pre-Doctoral Fellowship Sept. 2004 - Sept. 2007
California Institute of Technology

Ralph M. Parsons Graduate Fellowship Sept. 2007 - June 2009
California Institute of Technology

NIH F32 Postdoctoral National Research Service Award Sept. 2009 - Sept. 2012
"PET Imaging of Topoisomerase Expression in Breast Cancer" (PI)
Memorial Sloan Kettering Cancer Center

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- Department of Defense PCRP Hypothesis Development Award
“Imaging of Oxidative Stress in Prostate Cancer” (PI)
Memorial Sloan Kettering Cancer Center Sept. 2012 – Sept. 2013
- MSKCC Imaging and Radiation Sciences Research Award
“PET Imaging of Highly Reactive Oxygen Species” (PI)
Memorial Sloan Kettering Cancer Center Sept. 2012 – Sept. 2014
- Clinical and Translational Science Center Novel Research and
Methodology Seed Funding Grant
“Assessing the Pharmacology and Toxicity of the Molecular
Components of a Pretargeted Methodology for the PET Imaging
of Colorectal Cancer” (Co-PI)
Memorial Sloan Kettering Cancer Center Mar. 2014 – May 2014
- Translational and Integrative Medicine Research Fund Grant
“The First-in-Human Clinical Trial of a Pretargeted Methodology
for the PET Imaging of Colorectal Cancer” (Co-PI)
Memorial Sloan Kettering Cancer Center May 2014 – May 2015
- National Institutes of Health K99/R00 Career Transition Award
“Pretargeted Radioimmunotherapy Based on
Bioorthogonal Click Chemistry” (PI)
Memorial Sloan Kettering Cancer Center/Hunter College/CUNY July 2014 – July 2018
- Hunter College Center for Translational and Biological Research
Pilot Project Award
“Pretargeted PET Imaging of Pancreatic Cancer” (PI)
Hunter College/CUNY Jan. 2016 – Jan. 2017
- TeamConnor Childhood Cancer Foundation
Research Project Award
“Pretargeted Radioimmunotherapy of Pediatric Neuroblastoma ” (PI)
Hunter College/CUNY Jan. 2016 – Jan. 2017
- Cookies for Kids Cancer
Research Project Award
“The Development of Preclinical Validation of Site-Specifically Radiolabeled hu3F8 for the
PET Imaging and Radioimmunotherapy of Neuroblastoma” (Co-PI)
Memorial Sloan Kettering Cancer Center Jan. 2016 – Jan. 2018

Publications

- Chianese, A. R., Kovacevic, A., Zeglis, B. M., Faller, J. W., and Crabtree, R. H. “Abnormal C-5 N-Heterocyclic Carbenes: Extremely Strong Donor Ligands and their Iridium(I) and Iridium(III) Complexes.” *Organometallics*, **23**, 2461 (2004).
- Chianese, A. R., Zeglis, B. M., and Crabtree, R. H. “Unexpected Oxidative C-C- Cleavage in the Metallation of 2-substituted Imidazolium Salts to Give N-heterocyclic Carbene Complexes.” *Chem. Comm.*, **19**, 2176 (2004).
- Greiner, E., Boos, T. L., Prisinzano, T. E., DeMartino, M. G., Zeglis, B. M., Dersch, C. M., Marcus, J., Partilla, J. S., Rothman, R. B., Jacobsen, A. E., Rice K. C. “Design and Synthesis of Promiscuous High-Affinity Monoamine Transporter Ligands: Unraveling Transporter Selectivity.” *J. Med. Chem.*, **49**, 1766 (2006).

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Zeglis, B. M. and Barton, J. K. "A Mismatch-selective Bifunctional Rhodium-Oregon Green Conjugate: A Fluorescent Probe for Mismatched DNA." *J. Am. Chem. Soc.*, **128**, 5654 (2006).

Zeglis, B. M. and Barton, J. K. "DNA Base Mismatch Detection with Bulky Rhodium Intercalators: Synthesis and Applications." *Nature Protocols*, **2**, 357 (2007).

Zeglis, B. M., Pierre, V. P., and Barton, J. K. "Metallointercalators and Metalloinsertors." *Chem. Comm.*, **44**, 4565 (2007).

Zeglis, B. M., Boland, J. A., and Barton, J. K. "Targeting Abasic Sites and Single Base Bulges in DNA with Metalloinsertors." *J. Am. Chem. Soc.* **130**, 7530 (2008).

Zeglis, B. M. and Barton, J. K. "Binding of Ru(bpy)₃(eclatin)³⁺ to Matched and Mismatched DNA." *Inorg. Chem.* **47**, 6452 (2008).

Zeglis, B. M., Boland, J. A., and Barton, J. K. "Recognition of Abasic Sites and Single Base Bulges in DNA by a Metalloinsertor." *Biochemistry*, **38**, 39 (2009).

Zeglis, B. M., Kaiser, J. T., Pierre, V. C., and Barton, J. K. "Crystal Structures of a Rhodium Metalloinsertor Bound to an Adenosine-Adenosine Mismatch: General Architecture of the DNA insertion Binding Mode." *Biochemistry*, **48**, 4247 (2009).

Zeglis, B. M., Divilov, V., and Lewis, J. S. "Role of Metalation in the Topoisomerase II α Inhibition and Antiproliferation Activity of a Series of α -Heterocyclic-N¹-Substituted Thiosemicarbazones and Their Cu(II) Complexes." *J. Med. Chem.*, **54**, 2391 (2011).

Zeglis, B. M. and Lewis, J. S. "A Practical Guide to the Construction of Radiometallated Bioconjugates for Positron Emission Tomography." *Dalton Trans.*, **40**, 6168 (2011).

Zeglis, B. M., Pillarsetty, N., Divilov, V., Blasberg, R. A., and Lewis, J. S. "The Synthesis and Evaluation of N¹-(4-(2-[¹⁸F]-fluoroethyl)phenyl)-N⁸-hydroxyoctanediamide ([¹⁸F]-FESAHA), A PET Radiotracer Designed for the Delineation of Histone Deacetylase Expression in Cancer." *Nuc. Med. Bio.* **38**, 683 (2011).

Zeglis, B. M., Mohindra, P., Weissmann, G. I., Divilov, V., Hilderbrand, S. A., Weissleder, R., and Lewis, J. S. "A Modular Strategy for the Construction of Radiometallated Antibodies for Positron Emission Tomography Based on Inverse Electron Demand Diels-Alder Click Chemistry." *Bioconjugate Chem.* **6**, 424 (2011).

Bailey, G. A., Price, E. W., Zeglis, B. M., Ferreira, C. L., Boros, E., Lacasse, M. J., Patrick, B. O., Lewis, J. S., Adam, M. J., and Orvig, C. "Hazapa: A Versatile Acyclic Multifunctional chelator for ⁶⁷Ga, ⁶⁴Cu, ¹¹¹In, and ¹⁷⁷Lu" *Inorg. Chem.* **51**, 12575 (2012).

Zeglis, B. M., Holland, J. P., Lebedev, A. Y., Cantorias, M. V., and Lewis, J. S. "Radiopharmaceuticals for Imaging in Oncology with Special Emphasis on Positron-Emitting Agents" in *Nuclear Oncology: Pathophysiology and Clinical Applications*. Strauss W., Mariani G., Volterrani, D., and Larson, S. M., eds. Springer: New York, 35-78 (2012).

Deri, M. A.[§], Zeglis, B. M.[§], Francesconi, L. C., Lewis, J. S. "PET Imaging with ⁸⁹Zr: From Radiochemistry to the Clinic" *Nucl. Med. Bio.* **40**, 3 (2013).

[§]Co-first authors.

Zeng, D.[§], Zeglis, B. M.[§], Lewis, J. S., and Anderson, C. "The Growing Impact of Bioorthogonal Click Chemistry on the Development of Radiopharmaceuticals" *J. Nucl. Med.* **54**(6), 829 (2013).

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^sCo-first authors.

Zeglis, B. M., Davis, C. B., Aggeler, R., Kang, H. C., Chen, A., Agnew, B., and Lewis, J. S. "An Enzyme-Mediated Methodology for the Site-Specific Radiolabeling of Antibodies Based on Catalyst-Free Click Chemistry" *Bioconjugate Chem.* **24**, 1057 (2013).

Zeglis, B. M., Sevak, K. K., Reiner, T., Mohindra, P., Carlin, S. D., Zanzonico, P., Weissleder, R., and Lewis, J. S. "A Pretargeted PET Imaging Strategy Based on Bioorthogonal Diels-Alder Click Chemistry" *J. Nucl. Med.* **54(8)**, 1389 (2013).

Price, E. W., Zeglis, B. M., Cawthray, J. F., Ramogida, C. F., Ramos, N., Lewis, J. S., Adam, M. J., and Orvig, C. "H₈Octapa-Trastuzumab: The Application of a Versatile Acyclic Chelate System for ¹¹¹In and ¹⁷⁷Lu Imaging and Therapy." *J. Am. Chem. Soc.* **135(34)**, 12707 (2013).

Price, E. W., Zeglis, B. M., Lewis, J. S., Adam, M. J., and Orvig, C. "H₆phospa-Trastuzumab: A Bifunctional Methylenephosphonate-based Chelator with ⁸⁹Zr, ¹¹¹In and ¹⁷⁷Lu." *Dalton Trans.* **43**, 119 (2014).

Zeglis, B. M., Houghton, J. L., Evans, M. J., Viola-Villegas, N., Lewis, J.S. "Underscoring the Influence of Inorganic Chemistry on Nuclear Imaging with Radiometals." *Inorg. Chem.* **53(4)**, 1880 (2014).

Reiner, T., and Zeglis, B. M.* "The Inverse Electron Demand Diels-Alder Click Reaction in Radiochemistry" *J. Labl. Cmpd. Radiopharm.* **57(4)**, 285 (2014).

*Corresponding author

Zeglis, B. M., Emmetiere, F., Pillarsetty, N., Weissleder, R., Lewis, J. S., Reiner, T. "Building Blocks for the Construction of Bioorthogonally Reactive Peptides via Solid Phase Peptide Synthesis" *Chem. Open.* **3**, 48 (2014).

Deri, M., Ponnala, S., Zeglis, B. M., Pohl, G., Dannenberg, J.J., Lewis, J. S., Francesconi, L. C. "An Alternative Chelator for ⁸⁹Zr Radiopharmaceuticals: Radiolabeling and Evaluation of 3,4,3-(LI-1,2-HOPO)" *J. Med. Chem.* **57**, 4849 (2014).

Wagner, T., Zeglis, B. M., Groveman, S., Francesconi, L.C., Hermann, W. A., Kuhn, F. E., Reiner, T. "Synthesis of the first radiolabeled ¹⁸⁸Re N-heterocyclic carbene complex and initial studies on its potential use in radiopharmaceutical applications" *J. Label. Cmpd. Radiopharm.* **57**, 441 (2014).

Price, E. W., Zeglis, B. M., Cawthray, J., Lewis, J. S., Adam, M., Orvig, C. "What a Difference a Carbon Makes: H₈Octapa vs. C₃H₈Octapa, Ligands for ¹¹¹In and ¹⁷⁷Lu Radiochemistry" *Inorg. Chem.* Online Publication **53**, 10412 (2014).

Daumar, P., Zeglis, B. M., Ramos, N., Divilov, V., Sevak, K. K., Pillarsetty, N., Lewis, J. S. "Synthesis and Evaluation of ¹⁸F-labeled ATP Competitive Inhibitors of Topoisomerase II as Probes for Imaging Topoisomerase II Expression" *Eur. J. Med. Chem.* **86**, 769 (2014).

Zeglis, B. M., Davis, C. B., Abdel-Atti, D., Carlin, S. D., Chen, A., Aggeler, R., Chen, A., Agnew, B., and Lewis, J. S. "Chemoenzymatic Strategy for the Synthesis of Site-Specifically Labeled Immunoconjugates for Multimodal PET and Optical Imaging" *Bioconjugate Chem.* **25**, 2123 (2014).

Reiner, T., Lewis, J. S., Zeglis, B. M.* "Harnessing the Bioorthogonal Inverse Electron Demand Diels-Alder Cycloaddition for Pretargeted PET Imaging" *Journal of Vis. Exp.* **96**, e52335 (2015).

*Corresponding author

Zeglis, B. M., Lewis, J. S. "The Bioconjugation and Radiosynthesis of ⁸⁹Zr-DFO-Labeled Antibodies" *Journal of Vis.*

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Exp. **96**, e52521 (2015).

Zeglis, B. M.^{*}, Brand, C. Abdel-Atti, D., Carnazza, K., Cook, B., Carlin, S., Reiner, T., Lewis, J. S.^{*} “Optimization of a Pretargeted Strategy for the PET Imaging of Colorectal Carcinoma via the Modulation of Radioligand Pharmacokinetics” *Mol. Pharm.* **25**, 3575 (2015)

^{*}*Co-corresponding author*

Houghton, J. L., Zeglis, B. M., Abdel-Atti, D., Aggeler, A., Sawada, R., Agnew, B. J., Scholz, W. W., Lewis, J. S. “Site-Specifically Labeled CA19.9-Targeted Immunoconjugates for the PET, NIRF, and Multimodal PET/NIRF Imaging of Pancreatic Cancer” *Proc. Nat. Acad. Sci. U.S.A.* **112(52)**, 15850 (2015)

Meyer, J. -P., Houghton, J. L., Koslowski, P., Abdel-Atti, D., Reiner, T., Pillarsetty, N. V. K., Scholz, W. W., Zeglis, B. M.^{*}, and Lewis, J. S.^{*} “¹⁸F-Based Pretargeted PET Imaging Based on Bioorthogonal Diels-Alder Click Chemistry” *Bioconjugate Chem. Online Ahead of Print* (2015)

^{*}*Co-corresponding author*

Houghton, J. L., Zeglis, B. M., Abdel-Atti, D., Sawada, R., Scholz, W. W., Lewis, J. S. “Pretargeted ImmunoPET of Pancreatic Cancer: Overcoming Circulating Antigen and Antibody Internalization to Reduce Radiation Doses” *J. Nucl. Med. Online Ahead of Print*. (2015).

Adumeau, P., Sharma, S. K., Brent, C., Zeglis, B. M. “Site-Specifically Labeled Immunoconjugates for Molecular Imaging – Part 1: Cysteine Residues and Glycans” *Mol. Imag. Biol.* **18**, 1 (2016)

Adumeau, P., Sharma, S. K., Brent, C., Zeglis, B. M. “Site-Specifically Labeled Immunoconjugates for Molecular Imaging – Part 2: Peptide Tags and Unnatural Amino Acids” *Mol. Imag. Biol. Online Ahead of Print* (2016).

Sharma, S. K., Sevak, K. K., Monette, S., Carlin, S. D., Knight, J. C., Wuest, F. R., Sala, E., Zeglis, B. M.^{*}, Lewis, J. S. “Preclinical ⁸⁹Zr-immunoPET for High Grade Serous Ovarian Cancer and Lymph Node Metastasis” *J. Nucl. Med. Online Ahead of Print* (2016).

^{*}*Co-corresponding author*

Patents

Barton, J. K., Zeglis, B. M., Lau, I. H., Hart, J. R., and Lim, M. H. “Compounds and Methods for Nucleic Acid Mismatch Detection.” U. S. Patent # 7,786,298 B2 (Issued August 31, 2010).

Recent Presentation of Scientific Work

10th Congress of the World Federation of Nuclear Medicine and Biology. “New Radiopharmaceuticals: Availability, Development, and Challenges” Invited Speaker. Cape Town, South Africa: September 20, 2010.

Tri-Institutional Seminar Series of Rockefeller University, Weill Cornell Medical School, and Sloan Kettering Institute. “Click Chemistry as Modular Strategy for the Construction of Radiometallated Antibodies for Positron Emission Tomography” Oral Presentation. New York City, New York: March 31, 2011.

19th International Symposium of Radiochemical Sciences. “Diels-Alder Click Chemistry as a Modular Strategy for the Construction of Radiometallated Antibodies for Positron Emission Tomography” Oral Presentation. Amsterdam, Netherlands: August 29, 2011.

243rd American Chemical Society National Meeting. “Positron emission tomography imaging of colorectal cancer with ⁸⁹Zr-labeled huA33 antibody” Oral Presentation. San Diego, CA: March 26, 2012.

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Annual Meeting of the Society of Nuclear Medicine. “Radiometal Chelates and Click Chemistry: The Development of Modular Systems” Invited Speaker, Categorical Seminar. Miami, FL: June 9, 2012.

World Molecular Imaging Congress. “A Pre-Targeted ^{64}Cu -PET Imaging Methodology Based on the huA33 Antibody and Inverse Electron Demand Diels-Alder Click Chemistry” Oral Presentation. Dublin, Ireland: September 8, 2012.

Revolutionaries for Global Health Summit. “ ^{68}Zr -ImmunoPET: Emergent Targets and Clinical Translation.” Invited Speaker. Boston, MA: May 8, 2013.

Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging. “Labeling Peptides and Proteins Using Click Chemistry” Invited Speaker, Categorical Seminar. Vancouver, Canada: June 8, 2013.

Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging. “Creating Site-Specifically Labeled Immunoconjugates for Multimodal Imaging Using Bioorthogonal Click Chemistry” Oral Presentation. St. Louis, MO: June 11, 2014.

8th International Conference and Expo on Isotopes. “The Site-Specific Labeling of Antibodies on the Heavy Chain Glycans” Invited Speaker. Chicago, IL: August 28th, 2014.

2nd International Symposium on Technetium and Radiometals in Chemistry and Medicine (TERACHEM). “The Site-Specific Radiometallation of Antibodies on the Heavy Chain Glycans” Invited Speaker. Bressanone, Italy: September 11, 2014.

250th American Chemical Society National Meeting. “Site-specifically modified ^{89}Zr -labeled antibodies for PET and multimodal PET/optical imaging” Oral Presentation. Boston, MA: August 17th, 2015.

World Molecular Imaging Congress. “An Improved Strategy for the Pretargeted PET Imaging of Colorectal Cancer” Oral Presentation. Honolulu, HI: September 4th, 2015.

28th European Association of Nuclear Medicine Congress. “Advances in ^{89}Zr PET Imaging” Invited Speaker. Hamburg, Germany: October 10th, 2015.

International Workshop in Molecular Imaging. “Harnessing Bioorthogonal Chemistry for Pretargeted PET Imaging” Invited Speaker. San Sebastian, Spain: November 11th, 2015.