Curriculum Vitae

Joseph M. Fox
Professor, Department of Chemistry and Biochemistry
Professor, Department of Materials Science and Engineering
PI and Director, NIH Center of Biomedical Research Excellence on Discovery of Chemical Probes and Therapeutic Leads

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Education

Massachusetts Institute of Technology, Cambridge, MA 02139
NIH Postdoctoral Research Fellow
Year completed: 2001
Field: Organic and Organometallic Chemistry
Mentor: Prof. Stephen L. Buchwald

Columbia University, New York, NY 10027
Ph.D.
Year completed: 1998
Field: Organic Chemistry
Mentor: Prof. Thomas Katz

Princeton University, Princeton, NJ 08540
A. B.
Year completed: 1993
Field: Organic Chemistry
Mentor: Prof. Maitland Jones Jr.

Professional Positions

University of Delaware, Newark, DE 19716

2015–present, Professor (Secondary Appointment), Department of Materials Science and Engineering

2014–present, PI and Director, NIH-funded Center of Biomedical Research Excellence on Molecular Discovery

2011–present, Professor, Department of Chemistry and Biochemistry

2007–2011, Associate Professor, Department of Chemistry and Biochemistry

2001–2007, Assistant Professor, Department of Chemistry and Biochemistry

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Professional Honors and Experiences

2017 Delaware Bioscience Association Award for Academic Research

2016 Bristol-Myers Squibb Lecturer in Organic Chemistry, MIT

2014	American Chemical Society Delaware Section Award
2014-present	PI, NIH-funded Center of Biomedical Research Excellence on Molecular Discovery, University of Delaware
2013	New York Academy of Science, Keynote Speaker, Symposium on Bioorthogonal Chemistry in Biology and Medicine
2013	University of Delaware Outstanding Graduate Advising and Mentoring Award.
2007	Thieme Journal Award: from the editorial board of *Synthesis and Synlett*
2006-2011	NSF CAREER Award, Division of Chemistry
2006-2008	Camille and Henry Dreyfus Foundation, Special Program Grant Awardee
2006	ACS Division of Organic Chemistry Academic Young Investigator
2006	Eli Lilly Lecturer, Northwestern University
2005	Plenary Lecturer, State of Missouri Chemistry symposium, University of Missouri

Selected Service Activities

2018	NSF CHE review panel Chemical Catalysis (CAT)
2017	Mentor, NIH Mentoring Workshop for New Faculty in Organic and Biological Chemistry
2016–present	Scientific Advisory Board, European Union Horizon 2020 Center for *In Vivo* Click Imaging Agents
2016	NIH Study Section, COBRE Phase I Center Grants, ZGM1 RCB-3.
2016	NIH site visit team member: NIDDK Board of Scientific Counselors
2015	NIH Special Emphasis Panel Study Section, ZRG1 BCMB-D
2015	NIH Synthetic and Biological Chemistry B (SBCB) Study section
2015	NIH site visit team member: 2015 NCI Research Program Principal Investigator Review Meeting
2015	NIH Special Emphasis Panel Study Section, ZRG1 BCMB-W
2014	Chair, Gordon Research Conference, Organic Reactions and Processes
2013	Vice-chair, Gordon Research Conference, Organic Reactions and Processes
2011	Chair, Frontiers in Catalysis: Symposium Honoring Nobel Laureate Richard Heck
2011	NSF CHE review panel for Chemical Catalysis (CAT)
2010	NIH Synthetic and Biological Chemistry A (SBCA) Study section
2009-present	Member, Internal Advisory Committee of NIH COBRE Center for Advanced Biomaterials at UD
2009-present	Member, Steering Committee of NIH Chemistry-Biology Interface Program at UD
2009-present	Scientific Advisory Board Member, MBMR Biolabs, New York, NY

2006,2008,2009 NIH Postdoctoral Fellowship Study section [Ruth L. Kirschstein National Research Service Award (NRSA)], served November 2006, March 2008, October 2009

2003-2011 Consultant, Compact Membrane Systems, Newport, DE

Selected University Leadership and Service Activities

2018–2020 Chair, Provost's Committee for Faculty Expansion in Biopharmaceutical Science

2017–2018 Member, University Pharmaceutical Sciences Committee

2017–2018 Member, University NIH Planning Committee

2017 Member, University Biopharmaceutical Innovation Planning Committee

2016 Member, Provost's Commission on Tenure Track Faculty

2014–2016 co-Led effort to Rebuild Mass Spectrometry Core Facility

2014–2016 Led Effort to Establish University of Delaware Chromatography Center

2012–2017 Member, University Chemical Hygeine Committee

2004-2011 Chair, Richard F. Heck Lectureship, University of Delaware

Peer Reviewed Publications

89) Wang, M.; Vannam, R.; Lambert, W.; Xie, Y.; Wang, H.; Giglio, B.; Ma, X.; Wu, Z.; Fox, J. M.; Li, Z. Hydrophilic 18F-labeled trans-5-oxocene (oxoTCO) for efficient construction of PET agents with improved tumor-to-background ratios in neurotensin receptor (NTR) imaging. *Chemical Communications* **2019***, in press.*

88) Liu, S.; Moore, A. C.; Zerdoum, A. B.; Zhang, H.; Scinto, S. L.; Zhang, H.; Gong, L.; Burris, D. L.; Rajasekaran, A. K.; Fox, J. M.; Jia, X. Cellular Interactions with Hydrogel Microfibers Synthesized via Interfacial Tetrazine Ligation. Biomaterials **2018**, *180*, 24-35.

87) Hao, Y.; Song, J.; Ravikrishnan, A.; Dicker, K. T.; Fowler, E. W.; Zerdoum, A. B.; Li, Y.; Zhang, H.; Rajasekaran, A. K.; Fox, J. M.; Jia, X. Rapid Bioorthogonal Chemistry Enables in Situ Modulation of Stem Cell Behavior in 3D without External Triggers. *ACS Appl. Mater. Interfaces* **2018**, *10*, 26016–26027.

86) Darko, A.; Boyd, S. J.; Fox, J. M. Large Scale Flow Photochemical Syntheses of Functionalized trans-Cyclooctenes Using Sulfonated Silica Gel. *Synthesis* **2018** DOI: 10.1055/s-0037-1610240

85) Dicker, K. T.; Song, J.; Moore, A.; Zhang, H.; Li, Y.; Burris, D. L.; Jia, X.; Fox, J. M. Core Shell Patterning of Synthetic Hydrogels via Interfacial Bioorthogonal Chemistry for Spatial Control of Stem Cell Behavior *Chemical Science* **2018**, *9*, 5394-5404.

84) Smith, N.; Sawicki, L.; Rohlfing, K.; Kharkar, P. M.; Boyd, S. B.; Kloxin, A.; Fox, J. Fast, Irreversible Modification of Cysteines through Strain Releasing Conjugate Additions of Cyclopropenyl Ketones. *Org. Biomol. Chem.* 2**018**. 16, 2164-2169

83) Fang, Y.; Zhang, H.; Huang, Z.; Scinto, L.; Yang, J. C.; am Ende, C. W.; Dmitrenko, O.; Johnson, D.; S.; Fox, J. M. Photochemical Syntheses, Transformations, and Bioorthogonal Chemistry of trans-Cycloheptene and Sila trans-Cycloheptene Ag(I) Complexes. *Chemical Science* **2018**, *9*, 1953 - 1963.

82) O'Brien, J. G. K.; Chintala, S. R.; Fox, J. M. Stereoselective Synthesis of Bicyclo[6.1.0]nonene Precursors of the Bioorthogonal Reagents s-TCO and BCN *J. Org. Chem.* **2018***, 83*, 7500–7503.
In Special Issue on 'Organic & Biocompatible Transformations in Aqueous Media'

81) Lambert, W. D.; Scinto, S. L.; Dmitrenko, O.; Boyd, S. J.; Magboo, R.; Mehl, R. A.; Chin*, J. W.; Fox*, J. M.; Wallace*, S. Computationally guided discovery of a reactive, hydrophilic trans-5-oxocene dienophile for bioorthogonal labeling *Org. Biomol. Chem.* **2017**, *15*, 6640-6644.

80) Lamb, K. N., Squitieri, R. A., Chintala, S. R., Kwong, A. J., Balmond, E. I., Soldi, C., Dmytrenko, O., Reis, M. C., Chung, R., Addison, J. B., Fettinger, J. C., Hein, J. C., Tantillo, D. J.; Fox, J. M.*; Shaw, J. T.* Synthesis of Benzodihydrofurans by Asymmetric C-H Insertion Reactions of Donor/Donor Carbenoids. *Chem. Eur. J.* **2017**, *23*, 11843-11855.

79) Zhang, H.; Trout, W. S.; Liu, S.; Andrade, G. A; Hudson, D. A.; Scinto, S. L.; Dicker, K. T.; Li, Y.; Lazouski, N.; Rosenthal, J.; Thorpe, C.; Jia, X.; Fox, J. M. Rapid Bioorthogonal Chemistry Turn-on through Enzymatic or Long Wavelength Photocatalytic Activation of Tetrazine Ligation. *J. Am. Chem. Soc.* **2016**, 138, 5978–5983.
Highlighted in Chemical and Engineering News in their News of the Week section

78) Wang, M.; Svatunek, D.; Rohlfing, K.; Liu, Y.; Wang, H.; Giglio, B.; Yuan, H.; Wu, Z.; Li, Z., Fox, J. M. Conformationally Strained trans-Cyclooctene (sTCO) Enables the Rapid Construction of 18F-PET Probes via Tetrazine Ligation. *Theranostics* **2016**; 6, 887-895.

77) Panish, R. A.; Chintala, S. R.; Fox, J. M. Mixed-Ligand Chiral Rhodium(II) Catalyst Enables the Enantioselective Total Synthesis of Piperarborenine B. *Angew. Chem. Int. Ed.* **2016**, *55*, 4983-4987.
Highlighted in Synfacts

76) DeAngelis, A.; Panish, R.; Fox, J. M. Rh-Catalyzed Intermolecular Reactions of α-Alkyl-α-Diazo Carbonyl Compounds with Selectivity over β-Hydride Migration. *Acc. Chem. Res.*, **2016**, *49*, 115–127.

75) Panish, R.; Selvaraj, R.; Fox, J. M. Rh(II)-Catalyzed Reactions of Diazoesters with Organozinc Reagents. *Org. Lett.* **2015**, *17*, 3978–3981.

74) Murrey, H. E.; Judkins, J. C.; Am Ende, C. W.; Ballard, T. E.; Fang, Y.; Riccardi, K.; Di, L.; Guilmette, E. R.; Schwartz, J. W.; Fox, J. M.; Johnson, D. S. Systematic Evaluation of Bioorthogonal Reactions in Live Cells with Clickable HaloTag Ligands: Implications for Intracellular Imaging. *J. Am. Chem. Soc.* **2015,** *137*, 11461–11475.

73) Liu, S.; Zhang, H; Remy R. A.; Deng, F.; Mackay, M. E.; Fox, J. M.*; Jia, X.* Meter–Long Multiblock Copolymer Microfibers via Interfacial Bioorthogonal Polymerization. *Advanced Materials*, **2015**, *27*, 2783-2790.

72) Taylor, M. T.; Fox, J. M. , Biosynthesis of the C15-acetogenin Laurepoxide May Involve Bromine-induced Skeletal Rearrangement of a Δ4-Pxocene Precursor. *Tetrahedron Lett.,* **2015**, *56*, 3560–3563.
Invited article in special issue dedicated to Howard Zimmerman

71) Selvaraj, R.; Giglio, B.; Liu, S.; Wang, H.; Wang, M.; Yuan, H.; Chintala, S. R.; Yap, L.-P.; Conti, P. S.; Fox, J. M.; Li, Z. Improved Metabolic Stability for 18F PET Probes Rapidly Constructed via Tetrazine *trans*-Cyclooctene Ligation. *Bioconjugate Chem.* **2015**, *26*, 435–442.

70) Selvaraj, R.; Chintala, S. R.; Taylor, M. T.; Fox, J. M. *Org. Synth.* 3-Hydroxymethyl-3-phenylcyclopropene. **2014**, *91,* 322-337.

69) Darko, A.; Wallace, S.; Dmitrenko, O.; Machovina, M. M.; Mehl, R. A.; Chin, J. W.; Fox, J. M. Conformationally strained trans-cyclooctene with improved stability and excellent reactivity in tetrazine ligation. *Chemical Science* **2014**, *5,* 3770–3776.

68) Zhang, H.; Dicker, K. T.; Xu, X.; Jia, X.; Fox, J. M. Interfacial Bioorthogonal Cross-Linking. *ACS Macro Letters* **2014**, *3,* 727–731.

67) Selvaraj, R.; Fox, J. M. An Efficient and Mild Oxidant for the Synthesis of s-Tetrazines. *Tetrahedron Lett.* **2014**, *55*, 4795–4797.

66) Fox, J. M.; Robillard, M. In vivo chemistry - pushing the envelope *Curr. Opin. Chem. Biol.* **2014**, *21*, v–viii.

65) Panish, R.; Chintala, S. R.; Boruta, D. T.; Fang, Y.; Taylor, M. T.; Fox, J. M., Enantioselective Synthesis of Cyclobutanes via Sequential Rh-catalyzed Bicyclobutanation/Cu-catalyzed Homoconjugate Addition. *J. Am. Chem. Soc.* **2013,** *135*, 9283-9286.
Highlighted in Synfacts

64) Xie, X.; Fox, J. M., Diastereoselective Syntheses of Highly Substituted Methylenecyclopropanes via Copper- or Iron-Catalyzed Reactions of 1,2-Disubstituted 3-(Hydroxymethyl)cyclopropenes with Grignard Reagents. *Synthesis* **2013**, 1807-1814.
Invited article to a special issue dedicated to Scott Denmark

63) Xie, X.; Fox, J.; Li, Y., Selective Syntheses of Δα,β and Δβ,γ Butenolides from Allylic Cyclopropenecarboxylates via Tandem Ring Expansion/[3,3]-Sigmatropic Rearrangements. *Org. Lett.* **2013**, *15*, 1500–1503.

62) Fisher, L. A.; Smith, N. J.; Fox, J. M. Chiral Cyclopropenyl Ketones— Reactive and Selective Diels-Alder Dienophiles. *J. Org. Chem.* **2013**, *78*, 3342–3348.

61) Wu, Z., Liu, S., Hassink, M., Nair, I., Park, R., Li, L., Todorov, I., Fox, J. M., Li, Z., Shively, J. E., Conti, P. S., Kandeel, F. Development and Evaluation of 18F-TTCO-Cys40-Exendin-4: A novel PET Probe for Transplanted Islets Imaging. *Journal of Nuclear Medicine*, **2013**, *54*, 244–251.

60) Liu, S., Hassink, M., Selvaraj, R., Yap, L.-P., Park, R., Wang, H., Chen, X., Fox, J., Li, Z., Conti, P.S. Efficient 18F Labeling of Cysteine Containing Peptides and Proteins using the Tetrazine-*trans*-Cyclooctene Ligation. *Molecular Imaging*, **2013**, *12*, 121–128.

59) Selvaraj, R.; Fox, J. M. *trans*-Cyclooctene- a Stable, Voracious Dienophile for Bioorthogonal Labeling. *Curr. Opin. Chem. Biol.* **2013**, *17*, 753–760.

58) Tarwade, V.; Selvaraj, R.; Fox, J. M. Facially Selective Cu-Catalyzed Carbozincation of Cyclopropenes Using Arylzinc Reagents Formed by Sequential I/Mg/Zn Exchange. *J. Org. Chem.* **2012**, *77,* 9900–9904.
Highlighted in Synfacts

57) DeAngelis, A.; Dmitrenko, O.; Fox, J. M. Rh-Catalyzed Intermolecular Reactions of Cyclic α-Diazocarbonyl Compounds with Selectivity over Tertiary C–H Bond Migration. *J. Am. Chem. Soc.*, **2012**, *134*, 11035–11043.

56) Lang, K.; Davis, L.; Wallace, S.; Mahesh, M.; Cox, D. J.; Blackman, M. L.; Fox, J. M.; Chin, J. W. Genetic Encoding of Bicyclononynes and *trans*-Cyclooctenes for Site-specific Protein Labeling in vitro and in Live Mammalian Cells via Fluorogenic Diels-Alder reactions. *J. Am. Chem. Soc.* **2012**, *134*, 10317-10320.

55) Hassink, M. D.; Fox, J. M. Functionalized Cyclopropenes and Methylenecyclopropenes from Dianions of 3-Hydroxymethylcyclopropenes. *Synthesis*, **2012**, *44*, 2843–2850.
Invited contribution to Special Topic Issue on the synthesis and chemistry of small rings

54) Boruta, D. T.; Dmitrenko, O.; Yap, G. P. A.; Fox, J. M. Rh2(S-PTTL)3TPA—a Mixed-Ligand Dirhodium(II) Catalyst for Enantioselective Reactions of α-Alkyl-α-diazoesters. *Chemical Science,* **2012**, *3*, 1589-1593.

53) Seitchik, J. L; Peeler, J. C.; Taylor, M. T.; Blackman, M. L.; Rhoads, T. W.; Cooley, R. B.; Refakis, C.; Fox, J. M.; Mehl, R. A. Genetically Encoded Tetrazine Amino Acid Directs Rapid Site-Specific in Vivo Bioorthogonal Ligation with trans-Cyclooctenes. *J. Am. Chem. Soc.*, **2012,** *134,* 2898–2901.

52) Liu, D. S.; Tangpeerachaikul, A.; Selvaraj, R.; Taylor, M. T.; Fox, J. M.; Ting, A. Y. Diels-Alder Cycloaddition for Fluorophore Targeting to Specific Proteins Inside Living Cells. *J. Am. Chem. Soc.* **2012**, *134*, 792-795.

51) Royzen, M.; Taylor, M. T.; DeAngelis, A.; Fox, J. M. Total Synthesis of Hyacinthacine A2: Stereocontrolled 5-aza-cyclooctene Photoisomerization and Transannular Hydroamination with Planar-to-Point Chirality Transfer. *Chemical Science* **2011**, *2,* 2162–2165.
Highlighted by Chemical Science

50) Taylor, M. T.; Blackman, M. L.; Dmitrenko, O.; Fox, J. M. Design and Synthesis of Highly Reactive Dienophiles for the Tetrazine-*trans*-Cyclooctene Ligation. *J. Am. Chem. Soc.* **2011**, *133*, 9646–9649.
Highlighted in F1000

49) Selvaraj, R.; Liu, S.; Hassink, M.; Huang, C.-w.; Yap, L.-p.; Park, R.; Fox, J. M.; Li, Z.; Conti, P. S. Tetrazine-*trans*-Cyclooctene Ligation for the Rapid Construction of Integrin αvβ3 Targeted PET Tracer Based on a Cyclic RGD Peptide. *Bioorganic and Medicinal Chemistry Letters* **2011**, *21,* 5011–5014.
Invited contribution in special issue in honor of Carolyn Bertozzi, Tetrahedron Young Investigator Award

48) Hassink, M.; Liu, X.; Fox, J. M. Copper-catalyzed Synthesis of Allenoates from α- Substituted α-Diazoesters. *Org. Lett.* **2011**, *13*, 2388–2391.

47) DeAngelis, A.; Shurtleff, V. W.; Dmitrenko, O.; Fox, J. M. Rhodium(II)-Catalyzed Enantioselective C-H Functionalization of Indoles. *J. Am. Chem. Soc.* **2011**, *133*, 1650–1653.
Highlighted as a cover SynForm story and in SynFacts

46) Dong, Z.; Bai, S.; Yap, G. P. A.; Fox, J. M. Interplay between Diamine Structure and Absolute Helicity in Ni-salen Metallofoldamers. *Chemical Communications.* **2011**, *47*, 3781–3783.

45) Li, Z.; Cai, H.; Hassink, M.; Blackman, M. L.; Brown, R. C. D.; Conti, P. S.; Fox, J. M. Tetrazine-*trans*-Cyclooctene Ligation for the Rapid Construction of F-18 Labeled Probes. *Chemical Communications.* **2010**, *46*, 8043–8045.
Highlighted in Nature Chemistry

44) Dong, Z.; Plampin, J. N. III; Yap, G. P. A.; Fox, J. M. Minimalist Endgroups for Control of Absolute Helicity in Salen- and Salophen-based Metallofoldamers. *Org. Lett.* **2010**, *12*, 4002–4005.

43) DeAngelis, A.; Boruta, D. T.; Lubin, J.-B.; Plampin, J. N. III, Fox, J. M. The Chiral Crown Conformation in Paddlewheel Complexes. *Chemical Communications* **2010,** 4541-4543.

42) Xie, X.; Yang, Z.; Fox, J. M. Stereospecific synthesis of alkylidenecyclopropanes via sequential cyclopropene carbomagnesation/1,3-carbon shift. *J. Org. Chem.* **2010**, *75,* 3847–3850.

41) Fisher, L. A.; Zhang, F.; Yap, G. P. A.; Fox, J. M. Weak absolute helicity direction in Ni–salen by *trans*-cyclohexane-(1*R*,2*R*)-diamine. *Inorg. Chim. Acta.* **2010**, *364,* 259-260.

40) DeAngelis, A.; Dmitrenko, O.; Yap, G. P. A.; Fox, J. M. Chiral Crown Conformation of Rh_2(S-PTTL)$_4$: Enantioselective Cyclopropanation with α-Alkyl-α-diazoesters. *J. Am. Chem. Soc.*, **2009**, *131*, 7230–7231

39) Tarwade, V.; Liu, X.; Yan, N.; Fox, J. M. Directed Carbozincation Reactions of Cyclopropene Derivatives. *J. Am. Chem. Soc.* **2009**, *131*, 5382-5383.

38) DeAngelis A.; Taylor M. T.; Fox, J. M. Unusually Reactive and Selective Carbonyl Ylides for Three-component Cycloaddition Reactions. *J. Am. Chem. Soc.* **2009**, *131*, 1101–1105.
Highlighted in Synfacts

37) Blackman, M. L.; Royzen, M.; Fox, J. M. The Tetrazine Ligation: Fast Bioconjugation Based on Inverse-electron-demand Diels-Alder Reactivity. *J. Am. Chem. Soc.* **2008**, *130*, 13518–13519.
Highlighted in Chemical and Engineering News in their News of the Week section

36) Fisher, L. A.; Fox, J. M. Studies on the Stability of Cycloprop-2-ene Carboxylate Dianions and Reactions with Electrophiles. *J. Org. Chem.* **2008**, *73*, 8474–8478.

35) Tarwade, V.; Dmitrenko, O.; Bach, R. D.; Fox, J. M. The Curtius Rearrangement of Cyclopropyl- and Cyclopropenoyl Azides. A Combined Theoretical and Experimental Mechanistic Study. *J. Org. Chem.* **2008**, *73*, 8189–8197.

34) Pallerla, M. K.; Yap, G. P. A.; Fox, J. M. Co-complexes Derived from Alkene Insertion to Alkyne-dicobaltpentacarbonyl Complexes: Insight into the Regioselectivity of Pauson-Khand Reactions of Cyclopropenes. *J. Org. Chem.* **2008** *73*, 6137–6141.

33) Panne, P.; DeAngelis, A.; Fox, J. M. Rh-Catalyzed Intermolecular Cyclopropanation with α-Alkyl-α-diazoesters: Catalyst-Dependent Chemo- and Diastereoselectivity. *Org Lett.* **2008**, 10, 2987–2989.
Highlighted in Synfacts

32) Yan, N.; Liu, X.; Pallerla, M.; Fox, J. M. Synthesis of Stable Derivatives of Cycloprop-2-ene Carboxylic Acid. *J. Org. Chem.* **2008**, *73,* 4283–4286.

31) Royzen, M.; Yap, G. P. A.; Fox, J. M. A Photochemical Synthesis of Functionalized *trans*-Cyclooctenes Driven by Metal Complexation. *J. Am. Chem. Soc.* **2008**, *130*, 3760–3761.

30) DeAngelis, A.; Panne, P.; Yap, G. P. A.; Fox, J. M. Rh-Catalyzed Formation of Dioxolanes from α-Alkyl Diazoesters: Diastereoselective Cycloadditions of Carbonyl Ylides with Selectivity over β-Hydride Elimination. *J. Org. Chem.* **2008**, *73,* 1435–1439.

29) Yan, N.; Liu, X.; Fox, J. M. Facially Selective and Regioselective Carbometalation of Cyclopropenes by Aryl Grignard Reagents. *J. Org. Chem.* **2008**, *73*, 563–568.

28) Pallerla, M. K.; Fox, J. M. Enantioselective Synthesis of (–)-Pentalenene. *Org. Lett.* **2007**, *9*, 5625–5628.
Highlighted in Synfacts

27) Dong, Z.; Yap, G. P. A.; Fox, J. M. *trans*-Cyclohexane-1,2-diamine is a Weak Director of Absolute Helicity in Chiral Nickel-Salen Complexes. *J. Am. Chem. Soc.* **2007**, *129*, 11850–11853.

26) Panne, P.; Fox, J. M. Rh-catalyzed Intermolecular Reactions of Alkynes with α-Diazoesters that Possess β-hydrogens: Ligand-based Control over Divergent Pathways. *J. Am. Chem. Soc.* **2007**, *129*, 22–23.

25) Dong, Z.; Liu, X.; Yap, G. P. A.; Fox, J. M. Two-Dimensional Scaffolds for the Parallel Alignment of Rod-Shaped Conjugated Molecules. *J. Org. Chem.* **2007**, *72*, 617–625.
Highlighted in Synfacts

24) Dong, Z.; Karpowicz, R. J. Jr.; Bai, S.; Yap, G. P. A.; Fox, J. M. Control of Absolute Helicity in Single-Stranded Abiotic Metallofoldamers. *J. Am. Chem. Soc.* **2006**, *128*,14242–14243.
Highlighted in Synfacts

23) Zhang, F.; Fox, J. M. Synthesis of Cyclopropene α-Amino Acids by Enantioselective Desymmetrization. *Org. Lett.* **2006**, *8*, 2965–2968.

22) Liu, X.; Fox, J. M. Enantioselective, Facially Selective Carbomagnesation of Cyclopropenes. *J. Am. Chem. Soc.* **2006**, *128*, 5600–5601.

21) Yang, Z.; Xie, X.; Fox, J. M. Diastereoselective Synthesis of Methylenecyclopropanes from Chiral Cyclopropene Derivatives. *Angew. Chem. Int. Edit.* **2006**, *45*, 3960–3962.
Highlighted in Synfacts

20) Pallerla, M. K.; Fox, J. M. Diastereoselective Intermolecular Pauson Khand Reactions of Chiral Cyclopropenes. *Organic Letters* ***2005,*** *7,* 3593–3596.

19) Zhang, F.; Bai, S.; Yap, G. P. A.; Tarwade, V.; Fox, J. M. Abiotic Metallofoldamers as Electrochemically Responsive Molecules. *J. Am. Chem. Soc.* **2005**, *127*, 10590–10599.

18) Fox, J. M.; Yan, N. Metal Mediated and Catalyzed Nucleophilic Additions to Cyclopropenes. *Current Organic Chemistry* **2005**, *9,* 719–732. (*Invited Contribution).*

17) Liao, L.-a.; Yan, N.; Fox, J. M. The Dianion Approach to Chiral Cyclopropene Carboxylic Acids. *Org. Lett.* **2004**, *6*, 4937–4939.

16) Fox, J. M.; Dmintrenko, O.; Liao, L.-a.; Bach. R. D. Computational Studies of Nucleophilic Substitution at Carbonyl Carbon: Applications to Organic Synthesis. *J. Org. Chem.* **2004**, *69*, 7317–7328.

15) Stone, M. T.; Fox, J. M.; Moore, J. S. "A Helicene-Containing Foldamer Displaying Highly Solvent Dependent CD Spectra" *Org. Lett.* **2004**, *6*, 3317-3320.

14) Liao, L.-a.; Zhang. F.; Dmintrenko, O.; Bach, R. D.; Fox, J. M. A Reactivity/Affinity Switch for Parallel Kinetic Resolution: α–Amino Acid Quasienantiomers and the Resolution of Cyclopropene Carboxylic Acids. *J. Am. Chem. Soc.* **2004**, *126*, 4490–4491.

13) Liao, L.-a.; Zhang, F.; Yan, N.; Golen, J. A.; Fox, J. M. An Efficient and General Method for Resolving Cyclopropene Carboxylic Acids. *Tetrahedron* **2004**, 1803–1816.

12) Liao, L.-a.; Fox, J. M. A Copper-catalyzed Method for the Facially Selective Addition of Grignard Reagents to Cyclopropenes. *J. Am. Chem. Soc.* **2002**, *124*, 14322–14323.

Publications from Postdoctoral Research

11) Kaye, S.; Fox, J. M.; Hicks, F. A.; Buchwald, S. L. The Use of Catalytic Amounts of CuCl and Other Improvements in the Benzyne Route to Biphenyl-Based Ligands. *Adv. Synth. Catal.* **2001**, *343*, 789–794.

10) Chieffi, A.; Kamikawa, K.; Åhman, J.; Fox, J. M. Catalytic Asymmetric Vinylation of Ketone Enolates. *Org. Lett.* **2001**, *3,* 1897–1900.

9) Buchwald, S. L.; Fox, J. M. Recent Progress in the Suzuki Reactions of Aryl Chlorides. *Strem Chemiker* **2000** Vol. XVIII No. 1.

8) Tomori, H.; Fox, J. M.; Buchwald, S. L. An Improved Synthesis of Functionalized Biphenyl-Based Phosphine Ligands. *J. Org. Chem.* **2000**, *65*, 5334–5431.

7) Fox, J. M.; Huang, X.; Chieffi, A.; Buchwald, S. L. Highly Active and Selective Catalysts for the Formation of α-Aryl Ketones. *J. Am. Chem. Soc.* **2000**, *122*, 1360–1370.

Publications from Graduate Studies

6) Fox, J. M.; Katz, T. J.; Van Elschocht, S.; Verbiest, T.; Kauranen, M.; Persoons, A.; Thongpanchang, T.; Krauss, T.; Brus, L. Synthesis, Self-Assembly, and Nonlinear Optical Properties of Conjugated Helical Metal Phthalocyanine Derivatives. *J. Am. Chem. Soc.* **1999**, *121*, 3454–3459.

5) Fox, J. M.; Katz, T. J. Conversion of a [6]Helicene into an [8]Helicene and a Helical 1,10-Phenanthroline Ligand. *J. Org. Chem.* **1999**, *64*, 302–305.

4) Fox, J. M.; Goldberg, N. R.; Katz, T. J. Efficient Synthesis of Functionalized [7]Helicenes. *J. Org. Chem.* **1998**, *63*, 7456–7462.

3) Fox, J. M.; Lin, D.; Itagaki, Y.; Fujita, T. Synthesis of Conjugated Helical Acetylene-Bridged Polymers and Cyclophanes. *J. Org. Chem.* **1998**, *63*, 2031–2038.

2) Katz, T. J.; Liu, L.; Willmore, N. D.; Fox, J. M.; Rheingold, A. L.; Shi, S.; Nuckolls, C.; Rickman, B. H. An Efficient Synthesis of Functionalized Helicenes. *J. Am. Chem. Soc.* **1997**, *119*, 10054–10063.

Publication from Undergraduate Studies

1) Fox, J. M.; Scacheri Gillen, J. E.; Jones, K. J. L.; Jones, M., Jr.; Shevlin, P. B.; Armstrong, B.; Sztyrbicka, R. The Phenylcarbene Rearrangement as a Source of Real Carbenes. *Tetrahedron Lett.* **1992**, *33*, 5021–5024.

Patents

Issued and Licensed

Fox, J. M. (2011). Tetrazine-trans-Cyclooctene Ligation for the Rapid Construction of Radionuclide Labeled Probes. CN ZL1180041210; DE/EP/FR/GB/IT 2595967.

Fox, J. M. (2007). Tetrazine-Based Bio-orthogonal Coupling Reagents and Methods. 8,236,949; SN 12/174,913.

Submitted

Fox, J. M. (2016). trans-Cycloheptenes and Hetero-trans-Cycloheptenes for Bioorthogonal Labeling. US SN 62/144,360; WO SN US16/26418.

Fox, J. M. (2016). Methods for Inducing Bioorthogonal Reactivity. WO SN US16/66793.

Fox, J. M. (2016). Conformationally Strained trans-Cycloalkenes for Radiolabeling. WO: US16/66504.

Keynote and Named Lectures

5) Deutsche Forschungsgemeinschaft Priority Program 1623, Nurnberg Germany. Student Invited Keynote Speaker, March 2017.

4) Bristol-Myers Squibb Lecturer in Organic Chemistry, MIT, May 2016

3) New York Academy of Sciences. Keynote lecture, December 2013.

2) Northwestern University, Eli Lilly Lecturer in Organic Chemistry. February 6, 2005.

1) University of Missouri. Plenary Lecturer at statewide organic chemistry symposium. April 16, 2005.

Invited Conference Presentations

21) NCI Chemical Biology Retreat, Inaugural outside speaker, October 2018.

20) HHMI ProbeFest, Janelia Research Campus, Invited Speaker, October 14-17, 2018.

19) 4th Chemical Immunology Conference, Dutch Society for Immunology, Amsterdam, Invited Speaker, March 16, 2018.

18) Inter-American Photochemical Society Meeting, Invited Talk. Sarasota, Fl, January 2018.

17) ACS Meeting, Washington DC, Invited Speaker in Session on Using Light to Illuminate Biology, August 2017.

16) Gordon Research Conference on Bioorganic Chemistry. June 2016.

15) NYU Abi Dhabi International Conference on Organic and Bioorganic Chemistry. February 2016.

14) US Spain Symposium on Asymmetric Catalysis and Chemical Synthesis, Invited Speaker, May 25, 2016.

13) Pacifichem, Invited Seminar, Session on Bioorthogonal Chemistry, December 17, 2015.

12) 2nd US/Spain Workshop on Asymmetric Catalysis and Chemical Synthesis, Invited Seminar, April 2013.

11) Materials Research Society Conference, Invited Seminar, Boston, Dec 2013.

10) Methods in Protein Structure Analysis Conference, Ottawa, Canada, Invited Speaker, June 2012.

9) Northeast Regional IDEA Conference, Invited Lead Seminar Presentation, Salve Regina Univ, Rhode Island, 2011.

8) USA/Spain 1st Workshop in Asymmetric Chemical Synthesis and Catalysis, September 13-15, 2010, Invited Seminar Presentation.

7) Gordon Research Conference on Organic Reactions and Processes, Invited Speaker, July 18-23, 2010.

6) USA/UK International Conference on Organic Synthesis. Invited Seminar Presentation, January 3-8, 2007.

5) American Chemical Society Young Investigators Symposium. Invited Seminar Presentation, September 10-14, 2006.

4) Gordon Research Conference on Stereochemistry, Invited Seminar Presentation, June 18–23, 2006.

3) Gordon Research Conference on Organic Reactions and Processes, July 31–August 4, 2005. One of 2 invited talks selected from >50 faculty (from various international institutions) who presented posters at the GRC.

2) NSF Workshop on Synthetic Organic Chemistry, Invited Seminar Presentation, June 9–June 13, 2005.

1) Scientific Update Conference: Contemporary Technologies for Large Scale Separation of Enantiomers, Invited Seminar Presentation, San Francisco, March 21-22, 2005.

Invited Seminars and Presentations

77) University of Minnesota, Invited Seminar, February 2019.

76) Syracuse University, Invited Seminar, January 2019.

75) Avid Radiopharmaceuticals, May 1, 2018.

74) Georgia State Univ, Departmental Seminar, March, 2018.

73) Universiteit Leiden, Netherlands Institute for Molecules and Materials, Leiden Chemical Biology Lecture Series, March 15, 2018.

72) Radboud University Nijmegen, Netherlands, Institute for Molecules and Materials Invited Seminar, March 14, 2018.

71) Drexel University, Departmental Seminar, December 2017.

70) Chemistry Biology Interface Program Seminar, UD, November, 2017.

69) Indiana University, Department of Chemistry, October 2017.

68) Cornell University, Seminar, Department of Chemistry, October 2017.

67) SUNY Buffalo University, Foster Colloquium Series, Department of Chemistry, October 2017.

66) European Molecular Biology Lab/Cellzome/GlaxoSmithKline Joint Lecture Series in Chemical Biology, Heidelberg Germany, March 2017.

65) Leibniz-Forschungsinstitut für Molekulare Pharmakologie, Seminar, Berlin, Germany, March 2017.

64) Institut Catala d'Investigacio Quimica, Seminar, Catalonia Spain, May 2016.

63) Oregon State University, Chemistry Department Seminar, March 2017.

62) Portland State University, Chemistry Department Seminar, March 2017.

61) Swarthmore College, Seminar, January 2017.

60) Memorial Sloan Kettering Cancer Center, invited seminar, December 2016.

59) Loyola University of Chicago, invited seminar, August 2016.

58) Bio Life Science Professionals Invited Seminar, Delaware Biotechnology Institute, February 2016.

57) Penn State Univ, Department of Chemistry, Invited Seminar, Nov 8, 2016.

56) DuPont Crop Protection, May 2016

55) Emory University Department of Chemistry, May 2016

54) UD ACS Student/Industry Poster Session, Keynote talk, Newark, DE, May 2016.

53) National Cancer Institute- invited talk, November 2015.

52) Amgen, Thousand Oaks, CA, Invited Seminar. June 5, 2014 February 25, 2015.

51) Bryn Mawr, Department of Chemistry, Invited Seminar. December 2014.

50) Materials Science and Engineering, University of Delaware, Colloquium, November 12, 2014.

49) NC State University, Invited Seminar, March 2013.

48) Janssen Research & Development, Johnson and Johnson, Invited Seminar, March 7, 2012.

47) University of Arizona, Departmental Seminar, October 2012.

46) Gettysburg University, October 27, 2011.

45) NJ Biotechnology Chemistry Consortium, July 12, 2011.

44) USC Department of Radiology, Keck School of Medicine, October 29,2010.

43) University of Houston, Department of Chemistry, October 12, 2010.

42) University of South Florida, Department of Chemistry, November 19, 2009.

41) Hunter College, Department of Chemistry, October 23, 2009.

40) University of Kansas, Department of Chemistry, November 14, 2008.

39) Colorado State University, Department of Chemistry, November 10, 2008.

38) Florida State University, Department of Chemistry and Biochemistry, May 1, 2008.

37) National Institutes of Health, NIH Chemistry Seminar Series, Bethesda MD, February 21, 2008.
36) Astra Zeneca, Wilmington DE, January 24, 2008.
35) City College of New York, Department of Chemistry, November 12, 2007.
34) Smith College, Department of Chemistry, March 5, 2007.
33) University of New Mexico, Department of Chemistry, March 30, 2007.
32) West Virginia University, Department of Chemistry, January 31, 2007.
31) Johns-Hopkins University, Department of Chemistry, October 17, 2006.
30) New York University, Department of Chemistry, November 6, 2006.
29) Symyx Technologies, San Jose CA, December 1, 2006.
28) Wayne State University, Department of Chemistry, May 17, 2006.
27) University of Michigan, Department of Chemistry, May 16, 2006.
26) Michigan State University, Department of Chemistry, May 15, 2006.
25) University of Pittsburgh, Department of Chemistry, April 20, 2006.
24) Princeton University, Department of Chemistry, March 7, 2006.
23) Salisbury University, Department of Chemistry, March 3, 2006.
22) Columbia University, Department of Chemistry, February 16, 2006.
21) University of North Carolina at Chapel Hill, Department of Chemistry, January 26, 2006.
20) Wake Forest University, Department of Chemistry, January 25, 2006.
19) California Institute of Technology, Division of Chemistry and Chemical Engineering, January 18, 2006.
18) Brown University, December 9, 2005.
17) Duke University, Department of Chemistry, November 11, 2005.
16) University of Rochester, Department of Chemistry, November 4, 2005.
15) SUNY Buffalo, Department of Chemistry and Medicinal Chemistry, November 3, 2005.
14) George Washington University, Department of Chemistry, October 28, 2005.
13) University of Illinois at Chicago, Department of Chemistry, August 30, 2005.
12) Incyte Corporation, Wilmington DE. August 24, 2005.
11) Merck and Co., Inc. Process Research Division Rahway, NJ. March 2005.
10) Philadelphia Organic Chemists Club, University of Pennsylvania, January 27, 2005.
9) DuPont Stine-Haskell Research Center, November 1, 2004.
8) James Madison University, Harrisonburg, VA. Departmental Seminar, October 22, 2004.
7) University of Minnesota, Minneapolis, Minn. Organic Division Seminar, October 1, 2004.
6) Rutgers University, New Brunswick, NJ. Departmental Colloquium, May 4, 2004.
5) Temple University, Philadelphia, PA. Departmental Seminar, November 20, 2003.
4) The College of New Jersey, Trenton, NJ. Departmental Seminar, October 2, 2003.
3) Shepherd College, Shepherdstown, WV 25443. Seminar, September 22, 2003.
2) Rider University, Departmental Seminar, Fall 2002.
1) University of the Sciences in Philadelphia, Philadelphia, PA, 19104. Departmental Seminar, October, 2001.

Research Supervised

Postdoctoral Research Supervised

- Dr. Lian-an Liao, 2001-2004. Chief Scientific Officer, Sphinx Scientific Laboratory, China.
- Dr. Zhe Yang, 2003-2005. Current position: Research Scientist, Cytokinetics, Inc, South San Francisco, CA
- Dr. Zhe Zhang, 2005-2006. Principal Scientist III at Thermo Fisher Scientific
- Dr. Xiaozhong Liu, 2003–2007. Current position, Partner, Holly Welldone Technology Co. Ltd, China
- Dr. Patricia Panne 2005-2007. DFG Postdoctoral Fellow. Current Position, DuPont Performance Materials, Germany.
- Dr. Maksim Royzen, 2005-2008. Current Position, Assistant Professor, SUNY Albany.
- Raghu Vannam, 2015-2016. Current Position, Scientist at Ricerca Biosciences
- Yu Liu, Ph.D., 2013-2015. Current Position Assistant Professor, Rockhurst College
- Ampofo Darko, Ph.D., 2012-2014. Current Position Assistant Professor, University of Tennessee
- Patricia Panne, Ph.D., DuPont Performance Materials, Germany
- Dr. Olga Dmytrenko, 2009-2013. Current Position, Computational Scientist at UD

Doctoral Research Supervised

- Amanda Tallon, 2018-present
- Julia Rosenberger, 2017-present
- Paramesh Ramaraj, 2017-present
- Andrew Jemas, 2017-present
- Jessica Pigga, 2016-present
- Jessica O'Brien, 2016-present
- Chuanqi Wang, 2015-present
- Samuel Scinto, 2015-present
- Yixin Xie, 2015-present
- William Lambert, 2015-present
- William Trout, 2014-present
- Srinivas Chintala, 2012-present
- Yinzhi Fang, Ph.D. 2018, Research Investigator, Adesis, Inc.
- Yi Li, Ph.D. 2017. Research Investigator, API Process Chemistry, Incyte Pharaceuticals
- Han Zhang, Ph.D. 2017.Scientist at TP Therapeutics
- Samantha Brannick, Ph.D. 2016, Senior Staff Scientist, Solenis
- Robert Panish, Ph.D. 2016, Scientist I, Chemical Process R&D, Teva Pharmaceuticals
- Natalee Smith, Ph.D. 2015, Chemist, Covestro
- Ramajeyam Selvaraj, Ph.D. 2014, Assistant Manager at Rallis India Ltd
- David Boruta, Ph.D. 2013, Scientist, US Navy
- Michael Taylor, Ph.D. 2012, Marie Curie Postdoctoral Fellow, Cambridge, UK
- James Plampin, Ph.D. 2011, Carolina Consulting
- Matthew Hassink, Ph.D. 2011, Chemist, Food and Drug Administration
- Andrew DeAngelis, Ph.D. 2011, Product Manager, Johnson Matthey
- Melissa Blackman Ceo, Ph.D. 2011, Associate Manager of Outsourced Manufactoring, Gilead
- Laural Fisher, Ph.D. 2011, Medicinal Chemist, Appili Therapeutics
- Xie Xiaocong, Ph.D. 2010, Manager, Luan Wobam Trade Co.
- Vinod Tarwade, Ph.D. 2009, Senior Scientist at DSM Nutritional Products
- Mahesh Kumar Pallerla, Ph.D. 2007, Associate Principal Scientist at Ricerca Biosciences

- Zhenzhen Dong, Ph.D. 2007, Group Leader at Adesis, Inc.
- Ni Yan, Ph.D. 2007, Patent Counsel at Johnson Matthey
- Fan Zhang, Ph.D. 2006, Chemist, Tedia Inc.

Doctoral Research co-Supervised

- He Zhang (MSEG, with Xinqiao Jia)
- Jiyeon Song (MSEG, with Xinqiao Jia)
- Kevin Dicker, Ph.D. 2017 (MSEG, with Xinqiao Jia), NRC Postdoctoral Fellow at U.S. Naval Research Laboratory
- Kristy Longsdorf, Ph.D. 2011, (with Thomas Beebe), Ph.D. 2011, QS Pharma, Analytical Chemist

Masters Theses Supervised

- Chuck Ogbuawa, 2005, NSF Bridges to the Doctorate Fellow
- Katarina Rohlfing, 2016, Associate Scientist at Adesis Inc.

Undergraduate Research Supervised

Jeffrey Cragin (UD, ’22), Tyler Reagle (UD, 19’), Claire Lipscombe (UD ’19), Ben Pradell (UD, ’18), Andrew Currie (UD ‘18), Nikifar Lazouski (UD. ’16), Lauren Matlack (UD’ 16), Wei Dai (UD’ 16), Benjamin Prather (UD ’16), Ramya Sridharan (UD, ’14), Andrew Dover (UD, ’14), Naijing Su (UD, ‘14), John Feick (UD, ‘13), Valerie Shurtleff* (UD, ’11, Ph.D. Princeton), Greg Blasdel (UD, ’10), Ann Benavidez (UD, ’09), Doug DeSarro (UD, ‘08), Kaitlyn Kenney (UD, ‘08), Richard Karpowitz* (UD, ‘07; Ph.D. at Columbia), Michael Myers (UD, ‘06), Chris Schaffers (UD, ‘06), Gary DiFillipo (UD. ‘05), Michael DeMartino (UD, ‘03; Ph.D. with Phil Baran at Scripps), Stacy Rodgen (UD, ‘03 Ph.D. Boston Univ.), Susan Ricketts (UD, ’04), Bryan Franck (UD, ‘04), Chris Schores (UD, ‘04), Richard McClain (UD, ‘04),

Undergraduates Supervised Prior to UD

Steven Kaye* (MIT, 03, Ph.D. with Jeffrey Long at Berkeley), Naomi Goldberg* (Columbia, ’98: MD-Ph.D.(Biochem) from Columbia), Daniel Lin* (Columbia, ‘98).

Visiting Scientists

- Dennis Svatunek, Ph.D. student, TU Wien, Vienna
- Prof. Stephen Habay, Ph.D., Associate Professor, Salisbury University
- Prof. Magid Bayat, Ph.D., Department of Chemistry, Imam Khomeini International University, Qazvin, Iran
- Prof. Xiaoxia Wang, Ph.D., Zhejiang Normal University, China

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Sponsored Research

Center grant funding	Title	Dates
1P20GM104316 (Joseph M. Fox, PI), total costs $11.2 Million	Discovery of Chemical Probes and Therapeutic Leads	09/01/14 – 05/31/19

Instrument Grant Funding	Title	Dates
NIH 1S10OD025185-01A1 (Joseph Fox, PI)	High Sensitivity NMR Spectrometer with Cryoprobe	Pending Impact Score 20
NSF 1048367 (Klaus Theopold, PI; Charles Riordan, co-PI; Joseph M. Fox, co-PI)	Acquisition of a Single-Crystal X-ray Diffractometer	12/15/11 – 11/30/13
CHE 840401 (Klaus Theopold, PI; Joseph M. Fox, co-PI; Shi Bai, c0-PI)	Purchase of Cryoprobe for Cyberenabled NMR Spectroscopy	2/01/09 – 1/31/12
NIH S10 RR026962 (Joseph Fox, PI)	High Performance Digital NMR spectrometer	7/1/10-9/30/12
NSF MRI (0421224), PI: J.M. Fox; coPIs J. Koh, C. Riordan, T. Polenova	Acquisition of a 400 MHz spectrometer	8/1/04-7/31/07

Fox Group Sponsored Research	Title	Dates
NIH R01 GM132460-01 (Joseph Fox, PI)	Toolkit for Fast, Multipurpose and Inducible Bioorthogonal Chemistry	Selected for funding (on signed pay-list)
Delaware Bioscience Center (PI J. Fox, co-PI X. Jia)	Improving the Speed and Performance of Chromatography with Environmentally-Friendly Supercritical Flash Chromatography	3/15/19-3/15/20
Pfizer, Inc. (PI J. Fox)	Impacting Chemical Biology through Synthetic Excellence	12/1/18-11/30/19
NSF-DMR-1809612 (X. Jia, PI; J. Fox co-PI)	Modeling Perineural Invasion Using a Bioorthogonally Integrated Hydrogel Platform	8/15/18-7/30/21
NIH R01DC014461-01A1 (X. Jia, PI; J. Fox collaborator)	A Hydrogel-Based Cellular Model of the Human Vocal Fold	12/01/15 – 11/30/20
Delaware Bioscience Center CAT Grant	Advanced Tools for Near-IR Light Activated In Vivo Chemistry	02/01/18 - 1/31/19
NSF DMR 1206237 (X. Jia, PI; J. M. Fox, co-PI)	Spatial Control of Cell Behavior via Interfacial Bioorthogonal Chemistry	08/01/15 - 07/31/18
Delaware Bioscience Center CAT Grant	TCO-based Molecular Probes for Monitoring and Diagnosing Disease	08/01/16 - 1/31/18

NIH R01 EB44143123 (Joseph M. Fox, PI; Zibo Li dual-PI)	The Tetrazine Ligation for Protein Labeling and Pretargeted Imaging/Radiotherapy of Cancer	09/23/13 – 06/30/17
NSF CHE1300329 (Joseph M. Fox, PI)	Chiral Crown Catalysts for Selective Rh-Catalyzed Reactions	09/01/13 - 08/31/17
Osteoscience Foundation (X Lu, PI; J. Fox co-PI)	Biomimetic Heterogeneous Synthetic Matrices for TMJ Condylar Cartilage Repair	07/01/15–06/30/17
State of Delaware Federal Research and Development Matching Grant Program (J. Fox, PI),	Tetrazine Ligation for Efficient Protein Labeling and Pretargeted Imaging/Radiotherapy of Cancer	10/1/15–9/30/15
NSF CHE-1112409 (Thomas Beebe, PI; Joseph Fox, co-PI; Ryan Mehl, OSU, co-PI)	Surface Patterning of Biomaterials Using the Tetrazine Ligation	10/01/11 - 09/30/15
NSF DMR 1206310 (Xinqiao Jia, PI; John Rabolt, co-PI; Joseph Fox, co-PI)	Bioactive Scaffolds with Elastomeric Properties for the Engineering of Mechanically Active Tissues	08/01/12 - 07/31/15
R01 GM068640 (Joseph M. Fox, PI)	Selective Methods for Synthesis with Strained Molecules and Carbenoids	09/30/09 – 08/31/14
R01 GM068640, administrative supplement for diversity (Joseph M. Fox, PI)	Selective Methods for Synthesis with Strained Molecules and Carbenoids	7/01/10–8/31/12
State of Delaware CAT grant (Joseph M. Fox, PI)	Deconvoluting Catalyst Libraries with Supercritical Fluid Chromatography	01/01/13 – 03/31/14
University of Delaware Research Foundation (UDRF), Xinqiao Jia (PI), Joseph M. Fox (co-PI)	Hybrid, Multifunctional Polymers by Condensation Polymerization Employing Tetrazine Ligation	7/1/10 – 6/30/12
NIH 2R44GM077717-02A2 (Majumdar, S (PI); Joseph M. Fox (academic collaborator)	Improved Dehydration Process for Pharmaceutical Synthesis II	9/1/11–8/31/13
NIH 2P20RR017716-06A1 (Tom Beebe, PI; Fox, subproject investigator)	Molecular Design of Advanced Biomaterials	9/1/09-8/31/12
NIH 2P20RR017716-06A1 (Tom Beebe, PI; Fox, seed grant investigator, Zibo Li, co-I)	Molecular Design of Advanced Biomaterials	9/1/12-8/31/13
NIH 2P20RR017716-06A1 (Tom Beebe, PI; Fox, seed grant investigator; Ryan Mehl, co-I)	Molecular Design of Advanced Biomaterials	9/1/13-8/31/14
NIH 1R43GM084478-01A1 John J. Bowser, Compact Membrane Systems (PI) Joseph M. Fox (subcontractor)	*Contaminate Removal for Laboratory Synthesis*	2/1/09 – 1/31/11

NSF STTR: Novel Membrane Reactor for Biosynthesis Compact Membrane Systems (PI) Joseph M. Fox (subcontractor	*Novel Membrane Reactor for Biosynthesis*	7/1/09-6/30/11
NSF ENG1013513 SBIR Phase I (Maksim Royzen, MBMR Biolabs (PI), Joseph M. Fox (collaborator)	In vivo Fluorescence Imaging Kit for Cell Proliferation	7/1/10-12/31/10
NSF CHE0547865. Fox PI	CAREER: Metallofoldamers as Asymmetric Catalysts.	1/1/06-12/31/11
Eli Lilly Research Grant. Fox PI	Eli Lilly Research Grant	9/1/10–5/24/11
Camille and Henry Dreyfus Foundation Special Grant Program in the Chemical Sciences, PI Fox	The Path to Synthesis	5/1/06-4/30/08
Petroleum Research Foundation (41187-G1	Synthesis and Applications of Artificial Surfaces	6/1/04-5/31/06
University of Delaware Research Foundation	Asymmetric Synthesis with Strained Molecules	6/1/02-5/31/04
NIH (1P20RR17716-01 (PI M. Jain, Fox = project leader)	COBRE: Design of Hierarchical Recognition Motifs	9/1/02-8/31/07