Curriculum Vitae

Jia Guo, Ph.D.
School of Molecular Sciences & The Biodesign Institute
Arizona State University
Tempe, Arizona 85287
Phone: (480) 727-2096; Fax: (480) 965-2747
Email: jiaguo@asu.edu

EDUCATION

Columbia University, New York, NY 2005-2009
Ph. D in Chemistry, *Dissertation with Distinction*

University of Science and Technology of China, Hefei, China 2001-2005
B.S. in Chemical Physics, *Graduation with Honor*

EMPLOYMENT

Assistant Professor 2013-Present
School of Molecular Sciences
The Biodesign Institute
Arizona State University, Tempe, AZ

Postdoctoral Fellow 2010-2013
Departments of Chemistry and Biology
Stanford University, Stanford, CA

AWARDS AND HONORS

Emerging Investigators (Journal of *Analytical Methods*) 2015
Best Poster Presentation (*Environmental Mutagen Society*) 2012
Young Investigator Scholarship (*Alzheimer's Drug Discovery Foundation*) 2011
Dissertation with Distinction (*Columbia University*) 2009
Pegram Award for Outstanding Graduate Research (*Columbia University*) 2009
Faculty Fellowship (*Columbia University*) 2005-2009
Graduation with Honor (*University of Science and Technology of China*) 2005
Outstanding Student Scholarship (*University of Science and Technology of China*) 2001-2005
University Excellent Project (*University of Science and Technology of China*) 2004

RESEARCH FUNDING

Current research support

NIGMS/NIH R01 (1,650,000/5 years) PI (J. Guo) 2018-2023
Novel in situ proteomics methods to classify cell types in Alzheimer's brains

NIAID/NIH R21 (463,000/2 years) PI of subaward (J. Guo) 2018-2020

Imaging functionally distinct eosinophil subtypes within tissue biopsies using gene expression profiling and an in situ hybridization approach based on a concurrent multiple RNA targeting strategy

Cystic Fibrosis Foundation Grant (400,000/2 years) PI of subaward (J. Guo) 2018-2020
Understanding basal cell niche and cellular heterogeneity in Cystic Fibrosis

Completed research support

ASU-Mayo Seed Grant (50,000/1.5 year) PI (J. Guo) 2017-2018
Imaging of functionally distinct leukocyte subtypes within tissue biopsies using gene expression profiling and a multiple RNA targeting approach

ASU Start-up Fund (600,000/4 years) PI (J. Guo) 2013-2017

Pending research support

DOD Breakthrough Award (1,000,000/3 years) PI (J. Guo) 2019-2022
A novel multiplexed molecular imaging platform to decipher Epithelial-Mesenchymal plasticity in breast cancer progression

NIA/NIH R01 (2,600,000/4 years) Co-PI (J. Guo) 2019-2022
Consequences of early loss of an epigenetic molecule in the cell nucleus in Alzheimer's disease

PUBLICATIONS

1. R. Liao, M. Mondal, C. Nazaroff, D. Mastroeni, P. Coleman and **J. Guo*.** "Highly sensitive in situ proteomics with cleavable fluorescent tyramide reveals human neuronal heterogeneity" ***bioRxiv*** DOI: https://doi.org/10.1101/539106. *Submitted to* ***Nature Communications*** NCOMMS-19-06301.
2. R. Liao, and **J. Guo*.** "Highly sensitive and multiplexed in situ protein profiling with cleavable fluorescent streptavidin" ***bioRxiv*** DOI: https://doi.org/10.1101/555615.
3. R. Liao, M. Mondal, and **J. Guo*.** "Highly multiplexed single-cell in situ RNA and DNA analysis using bioorthogonal cleavable fluorescent oligonucleotides" ***Methods Mol Biol*** *In press.*
4. M. Mondal, R. Liao, C. Nazaroff, A. Samuel, and **J. Guo*.** "Highly multiplexed single-cell in situ RNA and DNA analysis with bioorthogonal cleavable fluorescent oligonucleotide probes" ***Chem Sci*** 2018, 9:2909-2917.
5. L. Xiao, and **J. Guo.** "Single-cell in situ RNA analysis with switchable fluorescent oligonucleotides" ***Front Cell Dev Biol*** 2018, 6:42.
6. M. Mondal, R. Liao, and **J. Guo*.** "Highly multiplexed single-cell protein analysis" ***Chem Eur J*** 2018, 24:7083-7091.
    - Highlighted in Technology Networks
7. E. N. Tóth, A. Lohith, M. Mondal, and **J. Guo**, A. Fukamizu, N. Pourmand*****. "Single-cell nanobiopsy reveals compartmentalization of mRNAs within neuronal cells" ***J Biol Chem,*** 2018, 293:4940-4951.

8. M. Mondal, R. Liao, L. Xiao, T. Eno, and **J. Guo**[*]**.** "Highly multiplexed single cell in situ protein analysis with cleavable fluorescent antibodies" ***Angew Chem Int Ed***, 2017, 56: 2636-2639.
    - Highlighted as hot paper in Angew Chem Int Ed
    - Highlighted in ACS Chem Biol
9. M. Mondal, and **J. Guo**[*]**.** "Comet-FISH for ultra-sensitive strand-specific detection of DNA damage in single cells" ***Methods Emzymol***. 2017, 591: 83-95.
10. L. Xiao, and **J. Guo**[*]**.** "Multiplexed single-cell in situ RNA analysis by reiterative hybridization" ***Analytical Methods***, 2015, 7: 7290-7295.
11. **J. Guo**, P. C. Hanawalt, and G. Spivak[*]. "Comet-FISH with strand-specific probes reveals transcription-coupled repair of 8-oxoGuanine in human cells" ***Nucleic Acids Res***, 2013, 41: 7700-7712.
12. **J. Guo**, J. Ju and N. J. Turro[*]. "Fluorescent hybridization probes for nucleic acid detection" ***Anal Bioanal Chem***, 2012, 402:3115-3125.
13. S. Wang, **J. Guo**, T. Ono and E. T. Kool[*]. "DNA polyfluorophores for real-time multicolor tracking of dynamic biological systems" ***Angew Chem Int Ed***, 2012, 51:7176-7180.
14. C. Qiu, S. Kumar, **J. Guo**, J. Lu, S. Shi, S. Kalachikov, J. Russo, A. Naini, E. Schon and J. Ju[*]. "Mitochondrial SNP genotyping by MALDI-TOF mass spectrometry using cleavable biotinylated dideoxynucleotides" ***Anal Biochem***, 2012, 427:202-210.
15. C. Qiu, S. Kumar, **J. Guo**, L. Yu, W. Guo, S. Shi, J. Russo and J. Ju[*]. "Design and synthesis of cleavable biotinylated dideoxynucleotides for DNA sequencing by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry" ***Anal Biochem***, 2012, 427:193-201.
16. **J. Guo**, S. Wang, N. Dai, Y. N. Teo and E. T. Kool[*]. "Multispectral labeling of antibodies with polyfluorophores on a DNA backbone and application in cellular imaging" ***PNAS***, 2011, 108: 3493-3498.
    - Highlighted in Nat Methods
17. N. Dai, **J. Guo**, Y. N. Teo and E. T. Kool[*]. "Protease probes built from DNA: multispectral fluorescent DNA–peptide conjugates as caspase sensors" ***Angew Chem Int Ed***, 2011, 50:5105-5109.
    - Highlighted as hot paper in Angew Chem Int Ed
18. **J. Guo**, L. Yu, N. J. Turro[*] and J. Ju[*]. "An integrated system for DNA sequencing by synthesis using novel nucleotide analogues" ***Acc Chem Res***, 2010, 43: 551-563.
19. L. Yu, **J. Guo**, N. Xu, Z. Li and J. Ju[*]. "DNA sequencing by synthesis using novel nucleotide analogues" ***The Handbook of Plant Mutation Screening***, 2010, 319-336.
20. **J. Guo**, N. Xu, Z. Li, S. Zhang, J. Wu, D. H. Kim, M. S. Marma, Q. Meng, H. Cao, X. Li, S. Shi, L. Yu, S. Kalachikov, J. Russo, N. J. Turro[*] and J. Ju[*]. "Four-color DNA sequencing with 3'-*O*-modified nucleotide reversible terminators and chemically cleavable fluorescent dideoxynucleotides" ***PNAS***, 2008, 105: 9145-9150.
    - Highlighted in PNAS, ranked 50 most read PNAS papers
21. Z. Wang, X. Xu[*], Y. Chen, S. Zhou, N. Kong, **J. Guo**, H. Liu and C. Shi. "Characteristics of the $Zn_xMg_{1-x}O$ films grown by electrophoresis method" ***Acta Physica Sinica***, 2004, 53: 3924-3928.

PATENTS

1. **J. Guo**, M. Mondal, R. Liao, L. Xiao. "*Cleavable fluorescent tyramide for sensitive and multiplexed analysis of biological samples*" *Patent filed*, 2019.
2. **J. Guo.** "*System and method for iterative detection of biological molecules*" 2018, US Patent 9,933,431.
3. J. Ju, D. H. Kim, **J. Guo**, Q. Meng, Z. Li and H. Cao. "*DNA sequencing with non-fluorescent nucleotide reversible terminators and cleavable label modified nucleotide terminators*" 2018, US Patent 10,260,094.
4. J. Ju, H. Cao, Z. Li, Q. Meng, **J. Guo**, S. Zhang and L. Yu. "*Synthesis of cleavable fluorescent nucleotides as reversible terminators for DNA sequencing by synthesis*" 2018, US Patent 10,144,961.
5. **J. Guo.** "*Consecutive hybridization for multiplexed analysis of biological samples*" *PCT Int. Appl.* 2017*,* WO 2017196527.
6. J. Ju, H. Cao, Z. Li, Q. Meng, **J. Guo**, S. Zhang and L. Yu. "*Synthesis of cleavable fluorescent nucleotides as reversible terminators for DNA sequencing by synthesis*" 2017, US Patent 9,670,539.
7. J. Ju, D. H. Kim, **J. Guo**, Q. Meng, Z. Li and H. Cao. "*DNA sequencing with non-fluorescent nucleotide reversible terminators and cleavable label modified nucleotide terminators*" 2015, US Patent 9,115,163.
8. J. Ju, H. Cao, Z. Li, Q. Meng, **J. Guo**, and S. Zhang. "*Synthesis of cleavable fluorescent nucleotides as reversible terminators for DNA sequencing by synthesis*" 2015, US Patent 9,175,342.

PRESENTATIONS

Invited talks:

1. "Highly multiplexed single-cell in situ analysis with cleavable fluorescent probes" *Arizona State University, School of Life Sciences,* Phoenix, AZ, Sep 20, 2019.
2. "Highly multiplexed single-cell in situ analysis with cleavable fluorescent probes" *Barrow Neurological Institute,* Phoenix, AZ, Sep 11, 2018.
3. "Novel fluorescent probes for single cells in situ genomics and proteomics analysis" *University of California San Diego, Jacobs School of Engineering*, San Diego, CA, June 5, 2018.
4. "Novel fluorescent probes for single cells in situ genomics and proteomics analysis" *Arizona State University, Biodesign Center for Immunotherapy, Vaccines, and Virotherapy Seminar Series*, Tempe, AZ, Jan 24, 2018.
5. "Comprehensive and integrated DNA, RNA and protein profiling in single cells in situ with cleavable fluorescent probes" *5th NIH Common Fund Single Cell Analysis Program Investigators Meeting*, Bethesda, MD, June 28-30, 2017.
6. "Highly multiplexed single-cell in situ analysis with cleavable fluorescent probes" *University of Southern California, School of Pharmacy,* Los Angeles, CA, May 16, 2017.

7. "Cleavable fluorescent probes for highly multiplexed single-cell in situ analysis" *DNA repair conference 2017,* Pacific Grove, CA, May 13-15, 2017.
8. "Highly multiplexed single-cell in situ analysis with cleavable fluorescent probes" *University of California Irvine, Department of Biological Chemistry,* Irvine, CA, May 12, 2017.
9. "Highly multiplexed single-cell in situ analysis with cleavable fluorescent probes" *The 2nd Single Cell Analysis USA Congress Annual Meeting,* Boston, MA, October 3-4, 2016.
10. "Cleavable fluorescent probes for highly multiplexed single-cell in situ analysis" *Mayo Clinic,* Scottsdale, AZ, December 3, 2015
11. "Single-cell proteomics with highly multiplexed immunofluorescence" *The 11th US HUPO Annual Meeting,* Tempe, AZ, March 15-18, 2015.
12. "Comet-FISH reveals transcription-coupled repair of 8-oxoGuanine" *The 2013 Gordon Research Conferences Mammalian DNA Repair,* Ventura, CA, February 10-15, 2013.
13. "Toward the $1000 genome: molecular engineering approaches for DNA sequencing by synthesis*" Columbia Chemistry/Biology Interface Workshop*, New York, NY, February 24, 2009.

Oral presentation at meetings:

1. "Highly multiplexed single-cell in situ analysis with cleavable fluorescent probes" *The 48th Society of Western Analytical Professors (SWAP) Annual Meeting,* Riverside, CA, January 29-30, 2016.
2. "Single-cell systems biology" *The 46th Society of Western Analytical Professors (SWAP) Annual Meeting,* Tempe, AZ, January 10-11, 2014.
3. "Single-cell systems biology with cleavable fluorescent probes" *The joint ASU/BSHRI neuroscience symposium,* Tempe, AZ, May 22, 2014.
4. "High throughput four-color DNA sequencing by synthesis on a chip" *The Wyeth/Columbia Research Workshop*, New York, NY, May 6, 2008.

Poster presentation at meetings:

1. "Comet-FISH with strand-specific probes reveals transcription-coupled repair of 8-oxoGuanine in human cells" *The 43rd Environmental Mutagen Society Annual Meeting*, Bellevue, WA, September 8-12, 2012.
2. "Multispectral labeling of antibodies with polyfluorophores on a DNA backbone and application in cellular imaging" *The 5th International Meeting on Synthetic Biology,* Stanford, CA, June 15-17, 2011.
3. "Four-color DNA sequencing with 3'-O-modified nucleotide reversible terminators and chemically cleavable fluorescent dideoxynucleotides" *The 238th ACS National Meeting*, Washington, DC, August 16-20, 2009.
4. "Design and synthesis of labile azido linkers for conjugation of fluorescent dyes to nucleotides for use as reversible terminators in DNA sequencing by synthesis" *The Symposium on Newer Trends in Photochemistry*, New York, NY, May 23, 2008.
5. "Four-color DNA sequencing with hybrid Sanger and SBS approach" *The NHGRI Sequencing Technology Conference*, San Diego, CA, March 18, 2008. **

6. "Fluorescent cDNA Labeling with Click Chemistry for DNA Microarray Analysis" *The International Conference on Genomics*, Hangzhou, China, October 25, 2006. **

TEACHING

Rating scale: 1-5, where 5 is best

Graduate level

BCH 561	Advanced topics in biochemistry (3 credit)	(Sch. of Mol. Sci.)
2016 Fall	Enrollment = 12	Rating = 4.51
2015 Fall	Enrollment = 16	Rating = 4.77
2014 Fall	Enrollment = 9 (team-taught with Petra Fromme)	Rating = 4.88
BCH 501	Current topics in biochemistry (1 credit)	(Sch. of Mol. Sci.)
2014 Fall	Enrollment = 33	Rating = 4.52
CHM 598	Genomic and proteomic technologies (3 credit)	(Sch. of Mol. Sci.)
2013 Fall	Enrollment = 6	Rating = 4.87
BCH 598	Genomic and proteomic technologies (3 credit)	(Sch. of Mol. Sci.)
2013 Fall	Enrollment = 9	Rating = 4.77

Undergraduate level

BCH 494	Molecular Diagnostics (3 credit)	(Sch. of Mol. Sci.)
2019 Spring	Enrollment = 10	Rating =
CHM 231	Elementary organic chemistry (3 credit)	(Sch. of Mol. Sci.)
2018 Spring	Enrollment = 241	Rating = 4.88
2017 Fall	Enrollment = 212	Rating = 4.81
2017 Spring	Enrollment = 229	Rating = 4.79
2016 Spring	Enrollment = 189	Rating = 4.57
2015 Spring	Enrollment = 124	Rating = 4.41

Guest lectures

BCH 494	Modern Bioanalytical Technologies	(Sch. of Mol. Sci.)
Mar 19, 2019	Topic: Multiplexed molecular imaging for diagnosis, 75min	
CHM 325	Analytical Chemistry	(Sch. of Mol. Sci.)
Feb 26, 2018	Topic: fluorescence microscopy, 50 min	
BMI 598	Image analysis and informatics	(Biodesign Institute)
Feb 5, 2017	Topic: Multiplexed molecular imaging for diagnosis, 75min	
BCH 494	Protein biochemistry	(Sch. of Mol. Sci.)
Aug 29, 2016	Topic: fluorescence microscopy, 50 min	
BMI 591	Image analysis and informatics	(Biodesign Institute)
Feb 5, 2016	Topic: highly multiplexed fluorescence imaging, 75min	

MENTORING

GRADUATE STUDENTS

Serve as **Thesis Advisor**:		Graduation Date
Yu-Sheng Wang	Ph.D. in Chem	08/2018-present
Ankush Tyagi	Ph.D. in Chem	08/2018-present

Thai Pham	Ph.D. in Chem	08/2018-present	
Christopher Nazaroff	Ph.D. in Chem	08/2014-present	
	(co-advised with James Lee at Mayo Clinic)		
Lu Xiao	Ph.D. in Chem	08/2013-present	
Renjie Liao	Ph.D. in Chem	08/2013-present	May 2019
Manas Mondal	Ph.D. in Chem	08/2013-12/2018	Dec 2018

Serve as **PhD Oral Committee** member or chair:

Cruz Jorvani	(Ros lab)	(member)	Oct 2018
Trygve Nelson	(Mills lab)	(Chair)	Sep 2018
Soma Chaudhary	(Green lab)	(member)	Apr 2018
Alex Buchberger	(Green lab)	(member)	Mar 2017
Tara Macculloch	(Green lab)	(member)	Feb 2017
Feng Xiao	(Tao lab)	(member)	Aug 2016
Stephanie Thibert	(Borges lab)	(member)	Aug 2016
Robayet Chowdhury	(Woodbury lab)	(member)	Apr 2016
Duo Ma	(Green lab)	(member)	Mar 2016
Hong Fan	(Yan lab)	(member)	Mar 2016
Claire Crowther	(Hayes lab)	(member)	Nov 2015
Sally Jensen	(Borges lab)	(Chair)	Apr 2015
Yu Zhou	(Yan lab)	(member)	Apr 2015
Di Shen	(Wang lab)	(member)	Apr 2015
Guangzhong Ma	(Tao lab)	(member)	Mar 2015

Serve as **Thesis Supervisory Committee** member:		Graduation Date
Guangzhong Ma	Ph.D. in Chemistry (Tao lab)	Sep 2019
Zhoumai Jiang	M.S. in Chemistry (Wang lab)	May 2019
Feng Xiao	M.S. in Chemistry (Tao lab)	Apr 2017
Laura Tichacek	M.S. in Chemistry (Wachter lab)	Jul 2016

UNDERGRADUATE STUDENTS

Serve as **Honors Thesis Advisor**:		Graduation Date
Adam Samuel	01/2016-05/2018	Apr 2018
Saiswathi Javangula	08/2015-05/2017	May 2017
Aakriti Gupta	08/2015-05/2017	May 2017

Serve as **Research Advisor**:

Steven Cruz	01/2016-06/2016
Mahir Qureshi	08/2014-05/2015
Taylor Eno	01/2014-12/2014

HIGH SCHOOL STUDENTS

Serve as **Research Advisor**:

Daniel Yulong Cheng	(Hamilton High School, Chandler, AZ)	5/2017-8/2017
Alex Zhang	(Hamilton High School, Chandler, AZ)	5/2017-8/2017
Yu Chen	(Hamilton High School, Chandler, AZ)	5/2017-8/2017

SERVICE

University and departmental service

Member, departmental seminar committee	08/2019-present
Member, faculty/scientific advisory committee for HR-MS	05/2014-present
Member, departmental safety committee	05/2014-05/2019
Member, undergraduate programs and awards committee	05/2015-05/2017

Professional service

A. Grant review panel service:

Panelist: National Science Foundation (2017)
Ad hoc reviewer: National Science Foundation (2017)
Ad hoc reviewer: UC Irvine Translational Science Pilot Grants (2017)
Panelist: National Institute of Health (2016)
Panelist: National Science Foundation (2015)
Panelist: National Science Foundation (2014)

B. Editorial board member of scientific journals:

Journal of Precision Clinical Medicine (2017-present)

C. Manuscript review service:

Review of manuscripts for *Journal of the American Chemical Society (2017), Advanced Science (2018)*, *Chemical Science (2019), Analytical Chemistry (2017, 2016), Trends in Biotechnology (2017), Analytical and Bioanalytical Chemistry (2018), Analytical Methods (2015)*, *Chinese Journal of Chemical Physics (2018), Journal of Nanoscience and Technology (2008), Yale Journal of Biology and Medicine (2012)*

D. Conferences advisory panel:

4th Single cell analysis USA congress (2018)
5th Annual single cell analysis UK congress (2017)
3rd Single cell analysis USA congress (2017)

E. Professional affiliations:

American Chemical Society
Sigma Xi The Scientific Research Society
The United States Human Proteome Organization (US HUPO)