Jonathan Ashby

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Education/Training Experience

Ford Foundation Postdoctoral Fellow – 09/2015-08/2016, University of California, Davis, CA
NIH T32 Postdoctoral Fellow – 09/2014-08/2015, University of California, Davis, CA

Advisor: Dr. Sheila David
Research focused on the isolation and quantitation of various isoforms of NEIL1, a DNA glycosylase involved in repair of damaged DNA lesions, from healthy and cancerous cell lines. In addition, research is focused on improved isolation of DNA repair proteins using non-cleavable DNA lesions and analogs of transition states within the DNA repair pathway.

Doctorate in Chemistry (Analytical) - 06/2014, University of California, Riverside, CA

Dissertation title: Development of high throughput methods for probing biomacromolecular interactions

Advisor: Dr. Wenwan Zhong
Research was conducted on identifying and quantifying the composition of the nanoparticle-protein corona around various particles based on the physical parameters of the nanomaterials. Research was also conducted on fractionation, identification and quantitation of protein carriers of microRNA, for cancer detection. Both projects utilized flow-field flow fractionation (F4) as well as protein analysis via LC-MS.

Bachelor of Science in Chemistry - 06/2009, Trinity College, Hartford, CT

Advisor: Dr. Janet Morrison
Research was conducted on the extraction of the organic pesticide rotenone from human hair using supercritical fluid extraction.

Professional Experience

Assistant Professor of Chemistry, Trinity College, Hartford, CT, 07/23-present

Bertha Phillips Rodger Assistant Professor of Chemistry, 07/2018 – 06/2023
MHC Fellow and Lecturer, Mount Holyoke College, South Hadley, MA, 07/2016 – 06/2018

Instructor of record for general chemistry (CHEM 101, CHEM 150), quantitative analysis (CHEM 223/306) and forensic chemistry (CHEM 321). Research interests include development of point-of-care sensing platforms for environmental and disease monitoring, as well as high-throughput screening methods for identification and characterization of protein-protein interactions.

Teaching Assistant, University of California, Riverside, CA, 09/2009-06/2011, 09/2012-12/2012

Taught laboratory courses in general chemistry (CHEM 1A), introductory organic chemistry (CHEM 112A, 112C), and instrumental analysis (CHEM 125).

Summer Research Intern, Merck & Co., 6/2008-8/2008, 6/2009-8/2009

A high-throughput screen was developed for predicting and identifying pharmaceutical cocrystals. In addition, potential cocrystal leads found using this screen were characterized using XRPD, DSC, NMR, TGA, and IR/Raman spectroscopy.

Supplemental Instruction Leader, Trinity College, 9/2007-12/2008

Utilized group-based learning to enhance student knowledge of material covered in lecture. Wrote mock exams and designed interactive review sessions.

Grants Awarded

2022 – Racial Equity Research and Action grant ($2343), Mount Holyoke College

Project Title: Rooting HSTEM – enhancing DEIR dialogue and dissemination in the sciences.

2020 – Pittcon Undergraduate Analytical Research Program Award ($9995), Society for Analytical Chemists of Pittsburgh

Project Title: Selection of structure-switching aptamers for usage in electrochemical biosensors.

2020 – Pittsburgh Conference National Memorial Conference Grant ($9665), Society for Analytical Chemists of Pittsburgh

Project Title: Electrochemical equipment for water quality measurements in interdisciplinary science courses.

2017-2018 – Faculty Research Support Grant ($1800), Mount Holyoke College

Project Title: Mass spectrometry access and research supplies for protein-protein binding research.

Grants Submitted, but not Awarded

January 2022 – Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences, National Science Foundation

Project Title: LEAPS-MPS: evaluation of size-based separation methods for selection of Structure-Switching Aptamers

October 2021 – Fund the Future Award, Mount Holyoke College

Project Title: Isolation of structure-switching aptamers via size-based separation methods

July 2021 –Cottrell Scholars Award, Research Corporation

Project Title: Selection of structure-switching small molecule aptamers using size-based separation

May 2019 – Pittcon Undergraduate Analytical Research Program Award, Society for Analytical Chemists of Pittsburgh

Project Title: Selection of structure-switching aptamers for usage in point-of-care biosensors

September 2016 – Pittsburgh Conference National Memorial Conference Grant, Society for Analytical Chemists of Pittsburgh

Project Title: Purchase of a flame atomic absorption spectrophotometer for analysis of metals in water and paint samples

Fellowships Awarded

2016-2018 – Consortium for Faculty Diversity Fellowship, Mount Holyoke College

2016 – University of California President's Postdoctoral Fellowship (Fellowship offered, declined due to prior commitments)

2015-2016 – National Research Council Ford Foundation Postdoctoral Fellowship

2014-2015 – National Institutes of Health T32 Postdoctoral Training Fellowship (UC Davis, Oncogenic Signaling & Chromosome Biology)

2011-2014 – NSF Graduate Research Fellowship

Other Honors and Awards

2014 – Runner-up, AAAS Pacific Division Awards of Excellence, Chemistry/Biochemistry Division

2011 – University of California, Riverside: Outstanding Teaching Assistant Award

2009 – Trinity College: Lisa P. Nestor Award for Excellence in Student Teaching in Chemistry

2007 – American Chemical Society: ACS Scholars Awardee

Peer-Reviewed Publications (*Co-first author, *Italics indicates undergraduate researcher*)

Cao, Sheng; Rodgers, JohnPatrick; Yeo, Jongchan, Anderson-Steele, Brittany; **Ashby, Jonathan**; David, Sheila. 2'-fluorinated hydantoins as chemical biology tools for base excision repair glycosylases. *ACS Chem. Biol.* **2020**, *15,* 915-924.

Yuen, Philip; Green, Sydnee; **Ashby, Jonathan**; Lay, Kori; Santra, Abishek; Chen, Xi; Horvath, Martin; David, Sheila. Targeting base excision repair glycosylases with DNA containing transition state mimics prepared via click chemistry. *ACS Chem. Biol.* ***2019****, 14,* 27-36.

Fong, Miranda; Zhou, Weiying; Liu, Liang; Alonaga, Aileen; Chandra, Manasa; **Ashby, Jonathan**; Chow, Amy; O'Connor, Sean; Li, Sasha; Chin, Andrew; Somlo, George; Palomares, Melanie; Li, Zhuo; Tremblay, Jacob; Tsuyada, Akihiro; Sun, Guoqiang; Reid, Michael; Wu, Xiwei; Swiderski, Piotr; Ren, Xiubao; Shi, Yanhong; Kong, Mei; Zhong, Wenwan; Chen, Yuan; Wang, Shizen Emily. Breast-cancer-secreted miR-122 reprograms glucose metabolism in premetastatic niche to promote metathesis. *Nat. Cell Bio.* **2015,** *17*, 183-194

Ashby, Jonathan; *Ligans, Erik; Tamsi, Michael*; Zhong, Wenwan. High-throughput profiling of nanoparticle-protein interactions by fluorescamine labeling. *Anal. Chem.* **2015,** *87,* 2213-2219.

Ashby, Jonathan*; Flack, Kenneth*; Jimenez, Luis; Duan, Yaokai; *Kareem-Khatib, Abdel*; Somlo, George; Wang, Shizen Emily; Cui, Xinping; Zhong, Wenwan. Distribution profiling of circulating microRNAs in serum. *Anal. Chem.*, **2014**, *86*, 9343–9349.

Ashby, Jonathan; Pan, Songquin; Zhong, Wenwan. Size and surface functionalization of iron oxide nanoparticles influence the composition and dynamic nature of their protein corona. *ACS Appl. Mater. Interfaces*, **2014**, *6*, 15412–15419.

Ashby, Jonathan*; Schachermeyer, Samantha*; Duan, Yaokai; Jimenez, Luis; Zhong, Wenwan. Probing and quantif**y**ing DNA-protein interactions with asymmetrical flow field-flow fractionation. *J. Chrom. A.* **2014,** *1358,* 217-224.

Ashby, Jonathan; Schachermeyer, Samantha; Pan, Songquin; Zhong, Wenwan. Dissociation-based screening of nanoparticle-protein interactions via flow-field flow fractionation. *Anal. Chem.* **2013,** *85*, 7494-7501.

Young, Michael; *Liew, Erika*; **Ashby, Jonathan**; *McCoy, Kelsi*; Hooley, Richard. Spin state modulation of iron spin crossover complexes via hydrogen-bonding self-assembly. *Chem. Commun,* **2013**, *49*, 6331-6333.

Schachermeyer, Samantha; **Ashby, Jonathan**; Zhong, Wenwan. Aptamer-protein binding detected by asymmetric flow field flow fractionation. *J. Chrom. A.* **2013**, *1295,* 107-13.

Schachermeyer, Samantha; **Ashby, Jonathan**; *Kwon, MinJung;* Zhong, Wenwan. Impact of carrier fluid composition on recovery of nanoparticles and proteins in flow field flow fractionation. *J. Chrom. A*. **2012,** *1264,* 72-79.

Schachermeyer, Samantha*; **Ashby, Jonathan***; Zhong, Wenwan. Advancements in field flow fractionation for the analysis of biomolecules: instrument design, miniaturization, and hyphenation. *Anal. Bioanal. Chem.,* **2012**, *404,* 1151-1158.

Lectures and Posters Delivered

Ashby, Jonathan. Fluorescamine as a multi-purpose reagent for probing protein interactions. Benedictine College (virtual). April 2023. Invited lecture.

Ashby, Jonathan. Screening of Protein-macromolecular interaction and inhibition via covalently interacting fluorogenic dyes. Pittsburgh Conference. Philadelphia, PA. March 2023. Oral presentation.

Ashby, Jonathan; *Monterroso, Maria; Liu, Corrine*. Fluorescence based screening of protein-protein interactions via fluorescamine incubation. Pittsburgh Conference (virtual). April 2022. Poster.

Ashby, Jonathan; *Monterroso, Maria; Liu, Corrine*. Fluorescence based screening of protein-protein interactions via fluorescamine incubation. American Chemical Society Spring meeting. San Diego, CA. March 2022. Poster.

Ashby, Jonathan. Flow field-flow fractionation based isolation of nucleic acid complexes. Amherst College. March 2018. Invited lecture.

Ashby, Jonathan; *Ligans, Erik; Tamsi, Michael*; Zhong, Wenwan. Fluorescamine-based screening of protein-protein interactions. Academic Employment Initiative, American Chemical Society Fall meeting. August 2017. Poster.

Ashby, Jonathan. Probing the effects of nanoparticle physical properties on the nano-bio corona. Trinity College. February 2017. Invited lecture.

Ashby, Jonathan; Cao, Sheng; Yeo, Jongchan; *Conklin, Jonathan*; David, Sheila. Affinity purification-mass spectrometry of NEIL1's isoforms from breast cancer cells. Conference of Ford Fellows. September 2015. Washington, DC. Poster.

Ashby, Jonathan; David, Sheila. Affinity purification of NEIL1 isoforms in breast cancer cell lines. Pittsburgh Conference. March 2015. New Orleans, LA. Oral presentation.

Ashby, Jonathan; Zhong, Wenwan. Fluorescamine-based screening of nanoparticle-protein interactions for determining variability in nanoparticle physical parameters. NOBCChE AM41, September 2014. New Orleans, LA. Oral presentation.

Zhong, Wenwan; **Ashby, Jonathan (presenter);** Zeng, Shang. Using analytical tools to assess binding between nanomaterials and proteins. ACS 248th National Meeting, August 2014. San Francisco, CA. Oral presentation.

Ashby, Jonathan; *Ligans, Erik*; Zhong, Wenwan. Fluorescamine-based screening of nanoparticle-protein interactions. 95th Annual AAAS Pacific Division Meeting, June 2014. Riverside, CA. Poster.

Other invited presentations

May 2022 – Invited panelist, Louisiana State University LS-PAC MODELS/National Postdoctoral Association. "Acing Academic Job Interviews".

April 2022 – Invited presentation to UMass graduate students. "Working at a Primarily Undergraduate Institution".

May 2021 – Invited panelist, Mount Holyoke College Teaching Renewal Week. "Digital Pedagogy: Reflections and Transformations with the Digital Pedagogy Team".

Professional Organizations and Activities

2012 – Current: National Organization for the Advancement of Black Chemists and Chemical Engineers (NOBCChE)

2014-Current: NOBCChE National Meeting Planning Committee (NPC):

2022: NOBCChE Business Development Chair

2021-current: NOBCChE Business Development Subcommittee member
2020: NOBCChE NPC Past Chair (2020 Annual Meeting)
2019: NOBCChE NPC Chair (2019 Annual Meeting)
2015, 2016: NOBCChE Student Programs Subcommittee Chair
2014: NOBCChE Student Programs Subcommittee member

2009 – Current: American Chemical Society
2019-2021: Reviewer, ACS Connecticut Valley Section Summer Undergraduate Research Fellowship applications

Institutional Service

Mount Holyoke College:

2022: Member, Faculty Conference Committee
2020 – 2021: Member, STEM DEI Steering Committee
2020 – 2021: Member, COVID-19 Testing Emergency Response Team
2018 – 2021: Faculty co-advisor, STEMPOC
2018 – 2021: Faculty advisor, MHC Chemistry and Biochemistry Club
2016 – Current: Member, Chemistry Instrumentation Working Group

University of California, Davis:

2015-2016: Member, UC Davis Graduate Council
2015-2016: Member, UC Davis Diversity and Inclusion Planning Committee
Graduate Students, Professional Students and Postdocs Working Group
2015-2016: Chair, UC Davis Postdoctoral Scholars Association
2014-2015: Secretary, UC Davis Postdoctoral Scholars Association

Professional Development

11/2021 – National Institutes of Health Virtual Grants Workshop
05/2019 – National Science Foundation Spring Grants Workshop, Los Angeles, CA
04/2018 – Being Human in STEM workshop. Co-hosted by Amherst College, Brown University and Yale University. New Haven, CT
08/2017 – Postdoc to Faculty Workshop. American Chemical Society. Washington, DC.
08/2017 – Cottrell Scholars Collaborative: New Faculty Workshop. American Chemical Society. Washington, DC
03/2017 – Introduction to Process-Oriented Guided-Inquiry Learning (POGIL). Springfield Technical Community College. Springfield, MA.
07/2016 – Junior Faculty and Postdoctoral Fellows Career Development Workshop. Minority Affairs Committee, American Society for Cell Biology. Chapel Hill, NC.
08/2015 – SciPhD Bootcamp: Core Professional Skills – Excelling in Team-based Organization. SciPhD. Berkeley, CA.