ROBERT FAIRMAN

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EDUCATION

1990-1993	The DuPont Merck Pharmaceutical Co.; Wilmington, DE NIH Post-Doctoral Fellowship, with William DeGrado and Stephen Brenner
1984-1990	Stanford University; Stanford, CA Program: Biochemistry; Thesis Advisor: Professor Robert L. Baldwin Degree: Ph.D.
1980-1984	Southampton College of Long Island University; Southampton, NY Degree: B.S., Chemistry, *magna cum laude* Minors: Computer Science, Mathematics

PROFESSIONAL APPOINTMENTS

2010-	Professor, Department of Biology, Haverford College
2013-2017	Adjunct Professor, Department of Biochemistry and Biophysics, University of Pennsylvania
2005-2013	Adjunct Associate Professor, Department of Biochemistry and Biophysics, University of Pennsylvania
2004-2010	Associate Professor, Department of Biology, Haverford College.
2002-2005	Adjunct Assistant Professor, Department of Biochemistry and Biophysics, University of Pennsylvania
1997-2004	Assistant Professor, Department of Biology, Haverford College.
1993-1997	Research Investigator, Bristol-Myers Squibb.

HAVERFORD LEADERSHIP ASSIGNMENTS

2017-2018	Chair, Department of Biology
2012-2016	Associate Provost for Faculty Development and Support
2009-2011	Faculty Representative to the Board of Managers
2009-2011	Member, Academic Council
2008-2010	Director, Koshland Integrated Natural Sciences Center
2007-2009	Chair, Department of Biology
2005-2010	Director, HHMI program coordinating committee
2000-2018	Director, MAST outreach program (intermittent)

HAVERFORD COMMITTEE ASSIGNMENTS

2018-2024	Chair, Institutional Biosafety and Laboratory Safety Committees
2019	Member, Ad Hoc Search for tenure-track faculty member in Biology at BMC
2018	Member, Ad Hoc Search for tenure-track faculty member in Biology at BMC
2018	Chair, Ad Hoc Search for Lab Instructor in Biology
2017	Member, Institutional Biosafety and Laboratory Safety Committee
2016	Member, Ad Hoc Search for tenure-track faculty member in Biology (microbiology)

2015	Member, Ad Hoc Search for tenure-track faculty member in Biology (biochemistry)
2015	Member, Ad Hoc Search for Science Librarian
2015	Member, IITS Policy Committee
2014	Member, Ad Hoc Search for Faculty Dossier Coordinator
2014-2016	Chair, College Space Planning Executive Committee
2013-2020	Advisor, 4+1 UPenn Bioengineering Program
2013-2014	Chair, Institutional Biosafety and Laboratory Safety Committee
2013-2014	Member, Committee on Faculty Rights, Responsibilities, and Conduct
2012-2015	Chair, Academic Spaces Programming Committee
2012	Member Ad Hoc Search for Grants Manager
2012	Member, Ad Hoc Search for Director of Facilities
2010-2011	Member, Office of Academic Resources development committee
2009-2010	Co-Chair, Institutional Biosafety and Laboratory Safety Committee
2008	Member, Middle States Reaccreditation subcommittee on faculty and curriculum
2008	Member, Ad Hoc Search for women's field hockey head coach
2008	Member, Ad Hoc Search for communications editor
2007	Member, Ad Hoc Search for Executive Director, CPGC
2006-2007	Chair, Laboratory Safety Committee
2006	Member, Ad Hoc Search for Executive Director, CPGC
2005-2007	Member, steering committee for the Center for Peace and Global Citizenship
2005-2006	Member, Ad Hoc Tenure Track Faculty Search, Biology, Bryn Mawr
2003-2006	Member, KINSC steering committee
2002-2003	Member, Committee on Admissions
2001-2006	Member, Mellon Tri-College Forum Faculty Committee
2001-2002	Coordinator, Biochemistry and Biophysics concentration
2001-2002	Member, Ad Hoc Tenure-Track Faculty Search, Biology
2000-2018	Director, MAST outreach program
1999-2000	Institutional Animal Care & Use Committee
1999-2000	Radiation Safety Committee
1998-1999	Member, Ad Hoc Tenure-Track Faculty Search, Psychology
1997-2018	Member, Biochemistry & Biophysics Concentration

INVITED SEMINARS AND CONFERENCES

ACS Mid Atlantic Regional Meeting, Hershey, PA, June 2017
Department of Biochemistry, Drexel University, February 2017
AU Mini-Symposium, University of Pennsylvania, October 2016
Grants Workshop, Georgia College & State University, October 2016
BITC Summer Symposium, University of Delaware, July 2016
Department of Biochemistry, Gettysburg College, PA, February, 2013
Department of Biology, Tufts University, MA, February, 2013
Department of Chemistry, Hunter College, NY, October, 2012
HHMI advisory panel on assessment, Chevy Chase, MD, June 2008
National Science Foundation Directorate for Education and Human Resources, Boston, MA, May 2008
HHMI conference on undergraduate research, Ashburn, VA, January 2008
American Chemical Society Western Regional Meeting, San Diego, CA, October 2007
Department of Chemistry, Emory University, Georgia, December 2005
The Protein Society, Boston, MA, July 2005
Department of Chemistry, Princeton University, NJ, November 2004.
Department of Biology, Villanova University, PA, September 2004.
Department of Chemistry, Pennsylvania State University, PA, October 2003.
Department of Biochemistry, U. Arizona, AZ, October 2003.

Department of Biochemistry and Molecular Pharmacology, U. Massachusetts, MA, August 2003
Department of Biochemistry, UMDNJ-Robert Wood Johnson Medical School, NJ, August 2003
Department of Chemistry & Biochemistry, U. Delaware, DE, November 2001
Techniques in analytical ultracentrifugation, Conshohocken, PA. Sponsored by Beckman Instruments, May 1998
Department of Molecular Biology, Princeton University, NJ, February 1997
Department of Chemistry, Penn. State University, PA, November 1995
Cold Spring Harbor Symposium on Topoisomerases, NY, March 1986

PROFESSIONAL MEMBERSHIPS

2005-2018 The American Chemical Society, member
1988-2015 American Association for the Advancement of Science, member
1987-2020 The Protein Society, member

PROFESSIONAL HONORS AND SERVICE

2023 External program reviewer, Biology Department, University of Richmond
2020 External program reviewer, Biochemistry Department, Gettysburg College
2016-2019 Member, Protein Science Membership Committee
2015 Graduate Research Fellowships Panel, NSF
2014 Biology Panel, NSF
2011 Chemistry Panel, NSF
2006-2019 Member, Editorial Board, Biochemistry and Molecular Biology Education
2005 Graduate Research Fellowships Panel, NSF
2004-2012 Member, Editorial Advisory Board, Protein Science
2004-2006 Member, Education Committee, The Protein Society
2004 Molecular Biochemistry Panel, NSF
2001-2004 Chair, Education Committee, The Protein Society
2001-2002 Nanoscale Panel, NSF

OTHER PROFESSIONAL SERVICE WORK

2014-2020 Member, Biochemistry thesis committee, Drexel University College of Medicine
2013 Member, Biochemistry and Molecular Biophysics thesis committee, U. Penn.
2010 Member, Biochemistry and Molecular Biophysics thesis committee, U. Penn.
2003 Member, Biochemistry and Molecular Biophysics thesis committee, U. Penn.
1991-1993 Chair, Post-Doctoral Science Committee, DuPont Merck
1987-1988 Member, Grants-In-Aid Awards Committee, Stanford University
1986-1989 Chair, Graduate Housing Advisory Committee, Stanford University

SCHOLARSHIPS, FELLOWSHIPS AND AWARDS

1990-1993 DuPont Merck Post-Doctoral fellowship
1990-1992 NIH Post-Doctoral training fellowship
1990 NATO Fellowship, Birkbeck College, London
1984-1989 NIH Training Grant Fellowship and Lucille T. Markey Charitable Trust Pre-Doctoral Fellowship, Stanford University
1982, 1983 Summer Student Program, Brookhaven National Laboratory
1982, 1983 Presidential Citizenship Award, Long Island University
1980-1984 Presidential Scholarship, New York State Regents Scholarship, Dean's List, Faculty Honors List, Long Island University

GRANTS

2013-2018 National Science Foundation RUI, "The chemical basis for protein self-assembly and polymerization." Award: $448,107.
2012-2016 National Institutes of Health R15 AREA, "*In vivo* and crude extract analysis of polyQ aggregation intermediates." Lead coPI, Award: $350,612.
2009-2012 National Science Foundation MRI, "Acquisition of molecular and cellular imaging instrumentation." Lead coPI, Award: $996,294.
2009-2012 Noyce Teacher Scholarship Program at Bryn Mawr and Haverford College. coPI, Award: $897,421.
2008-2012 Howard Hughes Medical Institute grant to Haverford College, lead writer, $1,400,000
2008-2012 National Science Foundation RUI, "The chemical basis for protein self-assembly and polymerization." Award: $508,220.
2006-2010 National Science Foundation RUI, "Self-assembling porphyrins and porphyrin-modified peptides and studies of their photoelectronic properties." Award: $400,000.
2005-2008 National Science Foundation RUI, "Learning the rules that govern the folding and stability of coiled coils." Award: $339,839.
2005-2006 National Science Foundation, "A systems biology workshop, career panel and speaker session for the promotion of undergraduate protein science education and research." Award: $14,400.
2002-2005 National Science Foundation RUI, "Learning the rules that govern the folding and stability of coiled coils." Award: $313,353.
2000-2006 Packard Foundation, "Protein-Based Biomaterials for Biotechnology." Lead coPI, Award: $966,020.
1999-2002 National Science Foundation RUI, "Learning the rules that govern the folding and stability of coiled coils." Award: $270,000.
2000-2002 National Science Foundation MUE, "RUI: Advanced microscopy and manipulation instrument cluster for biological and biophysical studies." Award: $160,000.
1999-2001 National Science Foundation MBE, "RUI: Acquisition of a circular dichroism spectropolarimeter." Award: $56,000.
1999 Zimmer Corporation, "A Proposal submitted to the Zimmer Corporation for Supporting Interdisciplinary Science Research and Education." Award: $100,000.
1998-2001 Petroleum Research Fund, American Chemical Society, "Using electrostatics to design heteromeric coiled-coil interactions." Award: $30,000.
1998 Zimmer Corporation, "Interdisciplinary studies of structure and reactivity of proteins." Award: $100,000.

MEETING PRESENTATIONS (*Indicates Haverford undergraduates.)

Zhang, Yifan*, **Fairman, Robert.** Alpha-Synuclein Translocates from Neurons to Glia and Impairs Glial Homeostasis in *Drosophila*. 35th Anniversary Symposium of The Protein Society. July 2021. Online. Live presentation.

Robinson, Emma*, Nelson, Sophia*, Arango, Ashley*, Wong, Zoe*, Kokona, Bashkim*, **Fairman, Robert**. The effects of Hsp104 on *c9orf72*-associated polyGA aggregation and toxicity in *Drosophila melanogaster*. July 2018 Protein Society meeting, Boston, Massachusetts.

Wu, Jillian*, Jung, Helen S.*, Kokona, B., Smith, Walter, **Fairman, Robert**. Designing nanowires using *Geobacter sulfurreducens* Filamentous Protein. July 2018 Protein Society meeting, Boston, Massachusetts.

Vosatka, Karl*, Kokona, Bashkim, **Fairman, Robert**. ALS-associated dipeptide repeat peptide structures interact with G-quadruplex DNA. July 2018 Protein Society meeting, Boston, Massachusetts.

Fairman, Robert, Kokona, Bashkim, Winesett, Emily S.*, von Krusenstiern, Alfred N.*, Cryle, Max J. and Charkoudian, Louise K. Probing the Selectivity of Peptide Carrier Protein-Tailoring Enzyme Interactions using Analytical Ultracentrifugation. July 2015 Protein Society meeting, Barcelona, Spain.

Kokona, Bashkim, May, Carrie A., Cunningham, Nicole R., Richmond, Lynne*, Garcia, Franklin J.*, Durante, Julia*, Ulrich, Kathleen M.*, Roberts, Christine M., Link, Christopher D., Stafford, Walter F., Laue, Thomas M., and **Fairman, Robert**. Applying an analytical ultracentrifuge equipped with fluorescence detection to the study of polyglutamine aggregation in *Caenorhabditis elegans*. July 2015 Protein Society meeting, Barcelona, Spain.

Garcia, Franklin*, and **Fairman, Robert**. Quantifying the effect of the Hsp70 chaperone on polyQ aggregation *in vivo*. April 2014, Biomedical Science Careers Program, Boston Massachusetts.

Taggart, James C.*, Welch, Elizabeth Z.*, Bashkim Kokona, and **Fairman, Robert**. Exploring the interactions between a coiled-coil peptide model system and metallated porphyrins towards the design of photoelectronically active biomaterials. February 2013 Biophysical Society meeting, Philadelphia.

Kokona, Bashkim, Rosenthal, Zachary*, Johnson, Karl A., and **Fairman, Robert**. Using a peptide system to test the coiled-coil model of polyglutamine aggregation. February 2013 Biophysical Society meeting, Philadelphia.

Smith, Zachary*, Kokona, Bashkim, May, Carrie, Roberts, Christine, Link, Christopher, Laue, Thomas, and **Fairman, Robert**. Sedimentation velocity analysis of PolyQ assembly in *Caenorhabditis elegans* using a fluorescence detection system. February 2013 Biophysical Society meeting, Philadelphia.

Cuesta, Adolfo*, Weaver, Jessica*, Kokona, Bashkim, and **Fairman, Robert**. Using a beta hairpin system to model polyglutamine aggregation. August 2010 Protein Society meeting, San Diego, poster selected for oral presentation.

Kokona, Bashkim, Tsang, Betty*, Bretscher, Heidi*, Manning, Robert, and **Fairman, Robert**. Thermodynamic analysis of self-assembly in coiled-coil biomaterials. August 2010 Protein Society meeting, San Diego.

Pepe-Mooney, Brian J.* and **Fairman, Robert**. Self-assembly of coiled-coil peptide porphyrin complexes. August 2009 Protein Society meeting, Boston.

Alfieri, Katherine N.*, **Fairman, Robert**, Kokona, Bashkim, Miles, Timothy F.*, Smith, Melanie H.*, Meyerowitz, Justin*, and Capron, Kelsey*. Evidence for both steric zipper and polar zipper structures in polyglutamine fibrillar intermediates. August 2009 Protein Society meeting, Boston.

Pepe-Mooney, Brian J.* Kokona, Bashkim, and **Fairman, Robert**. Self-assembly of coiled-coil peptide porphyrin complexes. July 2009 Beckman Symposium, Irvine CA.

Pepe-Mooney, Brian J.*, Minassian, Haig*, Kokona, Bashkim and **Fairman, Robert**. Self-assembly of coiled-coil peptide porphyrin complexes. June 2009 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Alfieri, Katherine N.*, Kokona, Bashkim, Miles, Timothy F.*, Smith, Melanie H.*, Meyerowitz, Justin*, Capron, Kelsey*. and **Fairman, Robert**. Evidence for both steric zipper and polar zipper structures in polyglutamine fibrillar intermediates. June 2009 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Pepe-Mooney, Brian J.*Kokona, Bashkim and **Fairman, Robert**. The utilization of peptide porphyrin complexes: toward the development of photoelectronically conductive regulated filaments. June 2008 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Alfieri, Katherine N.*, Miles, Timothy F.*, Kokona, Bashkim and **Fairman, Robert**. A β-hairpin model for probing glutamine interactions in fibril formation. June 2008 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Bretscher, Heidi*, Tsang, Betty*, Kokona, Bashkim and **Fairman, Robert**. Characterization of designed peptides that self-assemble into nanoropes. June 2007 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Kokona, Bashkim, Rigotti, Daniel J., Wasson, Andrew S.*, Lawrence, Sarah H., Fazliyev, Farit, Jaffe, Eileen K. and **Fairman, Robert**. Probing the oligomeric assemblies of pea porphobilinogen synthase by analytical ultracentrifugation: implications for biological activity. June 2007 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Miles, Tim*, Sheehan, Molly*, Smith, Melanie H.* and **Fairman, Robert**. Examination of the role of glutamines in amyloidogenic sequences with model peptides. June 2007 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Smith, Melanie H.*, Aziz, Mohammed, Kokona, Bashkim, and **Fairman Robert.** A *de novo* designed model for the investigation of the effects of glutamines on the self-assembly of a β-hairpin into amyloid-like fibrils. August 2006 Protein Society meeting, San Diego, poster selected for oral presentation.

Smith, Melanie H.*, Aziz, Mohammed, Kokona, Bashkim, and **Fairman Robert.** A *de novo* designed model for the investigation of the effects of glutamines on the self-assembly of a β-hairpin into amyloid-like fibrils. July 2006 Beckman Symposium, Irvine CA.

Smith, Melanie H.*, Aziz, Mohammed, Kokona, Bashkim and **Fairman, Robert**. A de novo designed model for the investigation of the effects of glutamines on the self-assembly of a β–hairpin into amyloid-like fibrils. June 2006 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Smith, Melanie H.*, Aziz, Mohammed, Kokona, Bashkim, and **Fairman Robert.** A *de novo* designed model for the investigation of the effects of glutamines on the self-assembly of a β-hairpin into amyloid-like fibrils. June 2006 Biopolymers Gordon Conference, Newport RI.

Monahan, Kevin G.*, Kokona, Bashkim, Woolley, Andrew, and **Fairman, Robert**. Creating light- and metal-responsive coiled-coil polymers: towards the design of smart biomaterials. August 2005 Protein Society meeting, Boston.

Narayanan, Shilpa* and **Fairman, Robert**. Nickel-driven formation of noncovalent coiled-coil polymers: towards the design of smart biomaterials. August 2005 Protein Society meeting, Boston.

Kokona, Bashkim, Wasson, Andrew S.*, Rigotti, Daniel J., Jaffe, Eileen K. and **Fairman, Robert**. Probing the oligomeric state of pea porphobilinogen synthase by analytical ultracentrifugation: implications for biological activity. June 2005 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Narayanan, Shilpa* and **Fairman, Robert**. Nickel-driven formation of noncovalent coiled-coil polymers. June 2005 Department of Biochemistry & Biophysics (UPenn), Swarthmore, PA.

Wagner, Daniel*, Phillips, Charles*, Rigotti, Daniel, Smith, Walter, and **Fairman, Robert**. Design and characterization of protein nanoropes. March 2003 Protein Society meeting, Florence, Italy.

Rigotti, Daniel, Horne, Theresa*, Manning, Robert, Amador, Suzanne, **Fairman, Robert**. Structural properties of polymerization of the *Acanthamoeba castellanii* myosin II rod domain. 2003 Biophysical Society meeting, San Antonio, TX.

Rigotti, Daniel, Smith, Walter, **Fairman, Robert**. Study of the stability and polymerization of myosin II from *Acanthamoeba castellanii*. August 2002 Protein Society meeting, San Diego.

Wagner, Daniel*, Phillips, Charles*, Rigotti, Daniel, Smith, Walter, and **Fairman, Robert**. Designing coiled-coil polymers that employ short peptide building blocks. August 2002 Protein Society meeting, San Diego.

Robblee, James*, Solan, Amy*, Ratia, Kiira*, **Fairman, Robert**. Exploring the Structure Determinants for a Four-Chain Coiled Coil. July 2000 Protein Society meeting, San Diego.

Wright, Nathan*, Ali, Wasif*, Werner, Karin*, Wolpin, Eric*, Mosher, Rachel*, **Fairman, Robert**. Folding and design of a four-chain coiled coil towards the development of self-assembling biomaterials. July 1999 Protein Society meeting, Boston.

MANUSCRIPTS IN PREPARATION (*Indicates Haverford undergraduates.)

Kokona, Bashkim, Quinn, Jeanne M.*, Hofmann, Jennifer, Cunningham, Nicole R., Jacobsen, Danielle R.*, D'Acunto, Victoria F.*, Garcia, F. Jay*, Carlomagno, Yari, Petrucelli, Leonard, Link, Christopher D., Bonini, Nancy M., Laue, Thomas M., and **Fairman, Robert**. 2023. Biochemical and Biophysical analysis of aggregation of *C9orf72* dipeptide repeat polypeptides in *Drosophila melanogaster. In preparation for Analytical Biochemistry.*

PUBLICATIONS (*Indicates Haverford undergraduates.)

89. Uy, G; Farrell, LN; Faheem, SF; Kinne, LE; Adore, MG; Im, SH; Fairman, R (2024). The Effects of poly-GA and poly-PR *C9orf72* Dipeptide Repeats on Sleep Patterns in *Drosophila melanogaster*. microPublication Biology. 10.17912/micropub.biology.000973.
88. Zhang, Yifan*, Nelson, Sophia*, Viera-Ortiz, Ashley, Lee, Edward B., and **Fairman, Robert**. 2023. The *c9orf72* proline-arginine polypeptide gene product disrupts proteostasis through interaction with the proteasome. *J Neuropathol Exp Neurol,* **82**(11):901-910. doi.org/10.1093/jnen/nlad078.

87. Henriquez, Gabriela, Ahlawat, Jyoti, **Fairman, Robert**, and Narayan, Mahesh. 2022. Citric Acid Derived Carbon Quantum Dots Attenuate Paraquat-Induced Neuronal Compromise In Vitro and In Vivo. *ACS Chem. Neurosci.* 13:2399-2409. doi: 10.1021/acschemneuro.2c00099.
86. Ahlawat, Jyoti, Henriquez, Gabriela, **Fairman, Robert**, and Narayan, Mahesh. 2022. Gelatin-derived Carbon Quantum Dots Mitigate Herbicide-Induced Neurotoxic Effects In vitro and In vivo. *Biomaterials Advances,* 137:212837. doi: 10.1016/j.bioadv.2022.212837.
85. Travis, Sophie M., Kokona, Bashkim, **Fairman, Robert**, and Hughson, and Frederick, M. 2019. Roles of tryptophan-containing motifs in COPI coat stability and vesicle tethering. *Proc. Natl. Acad. Sci.,* USA, 116:24031-24040. doi.org/10.1073/pnas.1909697116.
84. Cunningham, Nicole R., Kokona, Bashkim, Quinn, Jeanne M.*, and **Fairman, Robert**. 2019. Sample Preparation and Size Analysis of *C9orf72* Dipeptide Repeat Proteins Expressed in *Drosophila melanogaster* Using Semi-Denaturing Detergent Agarose Gel Electrophoresis. *Methods Mol Biol*, 2039:91-101. doi: 10.1007/978-1-4939-9678-0_7.
83. Kokona, Bashkim, Cunningham, Nicole R., Quinn, Jeanne*, and **Fairman, Robert**. 2019. Aggregation Profiling of *C9orf72* Dipeptide Repeat Proteins Transgenically Expressed in *Drosophila melanogaster* Using an Analytical Ultracentrifuge Equipped With Fluorescence Detection. *Methods Mol Biol*, 2039:81-90. doi: 10.1007/978-1-4939-9678-0_6.
82. Rivas, Marco*, Courouble, Valentine*, Baker, Miranda C.*, Fiore, Kristen*, Frost, Alexander J.*, Jordan, Michael R.*, Krasnow, Emily N.*, Mollo, Aurelio*, Ridings, Stephen*, Sawada, Keisuke*, Shroff, Kavita D.*, Studnitzer, Bradley*, Thiele, Grace A.R.*, Sisto, Ashley*, Huff, Adam, **Fairman, Robert**, Beld, Joris Kokona, Bashkim, Charkoudian Louise K.. 2018. The effect of divalent cations on the thermostability of of type II polyketide synthase acyl carrier proteins. *AIChE J*, **00**:0 doi.org/10.1002/aic.16402.
81. Cookmeyer, David L.*,Winesett, Emily S.*, Kokona, Bashkim, Aliev, Sabina*, Bloch, Noah, B.*, Bulos, Joshua A.*, Evans, Irene L.*, Fagre, Christian R.*, Godbe, Kerilyn N.*, Khromova, Maryna*, Konstantinovsky, Daniel M.*, Lafrance, Alexander E.*, Lamacki, Alexandra J.*, Parry, Robert C.*, Quinn, Jeanne M.*, Thurston, Alana M.*, Tsai, Kathleen J. S.-C.*, Cryle, Max J., **Fairman, Robert** and Charkoudian, Louise K. 2017. Uncovering Protein-Protein Interactions through a Team-based Undergraduate Biochemistry Course. *PLoS Biol,* **15**(11):11:e2003145.
80. Kim, Surin*, D'Acunto, Victoria F.*, Kokona, Bashkim, Hofmann, Jennifer, Cunningham, Nicole R., Bistline, Emily M.*, Garcia, F. Jay*, Akhtar, Nabeel M.*, Hoffman, Susanna H.*, Doshi, Seema H.*, Ulrich, Kathleen M.*, Jones, Nicholas M., Bonini, Nancy M., Roberts, Christine M., Link, Christopher D., Laue, Thomas M., and Fairman, Robert. 2017. Sedimentation velocity analysis with fluorescence detection of mutant huntingtin exon 1 aggregation in *Drosophila Melanogaster* and *Caenorhabditis Elegans*. *Biochemistry* **56**:4676. doi: 10.1021/acs.biochem.7b00518.
79. Fairman, Robert. May 17, 2017, Twists and Turns in Protein Assembly. Not peer reviewed. http://www.scientia.global/professor-robert-fairman-twists-turns-protein-assembly/
78. Glaubman, Jessica, Hofmann, Jennifer, Bonney, Megan E.*, Park, Sumin*, Thomas, Jessica M.*, Kokona, Bashkim, Ramos-Falcón, Laura I.*, Chung, Yoonjie K.*, **Fairman, Robert**, and Okeke, Iruka N. 2016. Self-association motifs in the *Escherichia coli* heat-resistant agglutinin 1. *Microbiology* **162**:1091.
77. Boyaci, H., Shah, T., Hurley, A., Kokona, Bashkim., Li, Z., Ventocilla, C., Jeffrey, P.D., Semmelhack, M.F., **Fairman, R.,** Bassler, B.L., and Hughson, F.M. 2016. Structure, regulation, and inhibition of the quorum-sensing signal integrator Lux). *PLoS Biol* **14**:e1002464**.**

76. Kokona, Bashkim, May, Carrie A., Cunningham, Nicole R., Richmond, Lynne*, Garcia, F. Jay*, Durante, Julia C.*, Ulrich, Kathleen M.*, Roberts, Christine M., Link, Christopher D., Stafford, Walter F., Laue, Thomas M., and **Fairman, Robert**. 2016. Studying polyglutamine aggregation in *Caenorhabditis elegans* using an analytical ultracentrifuge equipped with fluorescence detection. *Protein Science,* **25:**605.
75. Kokona, Bashkim, Winesett, Emily S.*, von Krusenstiern, Alfred N.*, Cryle, Max J., **Fairman**, **Robert,** and Charkoudian, Louise K. 2016. Probing the selectivity of beta-hydroxylation reactions in non-ribosomal peptide synthesis using analytical ultracentrifugation. *Analyt. Biochem.,* **495**:42.
74. Little, Wheaton*, Robblee, James*, Dahlberg, Caroline*, Kokona, Bashkim, and **Fairman, Robert**. 2015. Effect of helical length on the stability of the Lac repressor antiparallel coiled coil. *Biopolymers,* **104**:395.
73. Zhao, et al., 2015. A Multilaboratory Comparison of Calibration Accuracy and the Performance of External References in Analytical Ultracentrifugation. *PLoS One,* **10**:e0126420.
72. Taggart, James C.*, Welch, Elizabeth Z.*, Mulqueen, Mary F.*, Dioguardi, Vincent B.*, Cauer, Alexandra G.*, Kokona, Bashkim, and **Fairman, Robert**. 2014. Testing the role of charge and structure on the stability of peptide-porphyrin complexes. *Biomacromolecules,* **15**:4544.
71. Kokona, Bashkim, Johnson, Karl A., and **Fairman, Robert**. 2014. Effect of helical flanking sequences on the morphology of polyglutamine-containing fibrils. *Biochemistry,* **53**:6747.
70. Kokona, Bashkim, Rosenthal, Zachary P.*, and **Fairman, Robert**. 2014. Role of the coiled-coil structural motif in polyglutamine aggregation. *Biochemistry,* **53**:6738.
69. Cheng, Richard P., Wang, Wei-Ren, Girinath, Prashant, Yang, Po-An, Ahmad, Raheel, Li, Jhe-Hao, Hart, Pier*, Kokona, Bashkim, **Fairman, Robert,** Kilpatrick, Casey, Argiros, Annmarie. 2012. Effect of charged residue side chain length on intrahelical glutamate-lysine ion pairing interactions. *Biochemistry*, **51**:7157.
68. Pepe-Mooney, Brian J.*, Kokona, Bashkim, and **Fairman, Robert**. 2011. Characterization of mesoscale coiled-coil peptide-porphyrin complexes. *Biomacromolecules,* **12**:4196.
67. Tsang, Betty*, Bretscher, Heidi S.*, Kokona, Bashkim, Robert S. Manning, and **Fairman, Robert**. 2011. Thermodynamic analysis of self-assembly in coiled-coil biomaterials. *Biochemistry*, **50**:8548.
66. Cheng , Richard P., Girinath, Prashant, Suzuki, Yuta, Kuo, Hsiu-Ting, Hsu, Hao-Chun, Wang, Wei-Ren, Yang, Po-An, Gullickson, Donald, Wu, Cheng-Hsun, Koyack, Marc J., Chiu, Hsien-Po, Weng, Yi-Jen, Hart, Pier,* Kokona, Bashkim, **Fairman, Robert**, Lin, Tzu-En, Barrett, Olivia. 2010. Positional Effects on Helical Ala-Based Peptides. *Biochemistry,* **49**:9372.
65. Smith, Melanie H.*, Miles, Timothy F.*, Sheehan, Molly*, Alfieri, Katherine N.*, Kokona, Bashkim, and **Fairman, Robert**. 2010. Polyglutamine fibrils are formed using a simple designed β-hairpin model. *Proteins: Struct. Funct. Bioinf.,* **78**:1971.
64. Chiu, Hsien-Po, Kokona, Bashkim, **Fairman, Robert**, and Cheng, Richard P. 2009. Effect of highly fluorinated amino acids on protein stability at a solvent-exposed position on an internal strand of protein G B1 domain. *J. Am. Chem. Soc.,* **131**:13192.
63. Pepe-Mooney, Brian J.* and **Fairman, Robert.** 2009. Peptides as materials. *Curr. Opin. Struct. Biol.,* **19**:483-494.
62. Kokona, Bashkim, Kim, Andrew M.*, Roden, R. Claire*, Daniels, Joshua P.*, Pepe-Mooney, Brian J.*, Kovaric, Brian C.*, de Paula, Julio C., Johnson, Karl A., and **Fairman, Robert**. 2009. Self-assembly of coiled-coil peptide-porphyrin complexes. *Biomacromolecules,* **10**:1454.
61. Root, Benjamin C.*, Pellegrino, Laurel*, Crawford, Emily D.*, Kokona, Bashkim, **Fairman, Robert**. 2009. Design of a heterotetrameric coiled coil. *Protein Sci.*, **18**:329.
60. Salinger, Nina*, Kokona, Bashkim, **Fairman, Robert**, and Okeke, Iruka N. 2009. The plasmid-encoded regulator activates factors conferring lysozyme resistance on enteropathogenic Escherichia coli. *Appl. Environ. Microbiol.,* **75**:275.
59. Kokona, Bashkim, Rigotti, Daniel J., Wasson, Andrew S.*, Lawrence, Sarah H., Jaffe, Eileen K., and **Fairman, Robert**. 2008. Probing the oligomeric state of pea porphobilinogen synthase by analytical ultracentrifugation. *Biochemistry,* **48**:10649.

58. Chiu, Hsien-Po, Suzuki, Yuta, Gullickson, Donald, Ahmad, Raheel, Kokona, Bashkim, **Fairman, Robert**, Cheng, Richard P. 2006. Helix propensity of highly fluorinated amino acids. *J. Am. Chem. Soc.,* **128:**15556.
57. Kovaric, Brian C.*, Kokona, Bashkim, Schwab, Alexander D., Twomey, Margaret A.*, de Paula, Julio C. and **Fairman, Robert**. 2006. Self-assembly of peptide porphyrin complexes: towards the development of smart biomaterials. *J. Am. Chem. Soc.,* **128:**4166.
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RESEARCH INTERESTS

My laboratory is interested protein misfolding and aggregation, particularly as it relates to human neurodegenerative disease. While we are looking broadly at this basic aberrant biochemical process, through studies of a wide variety of diseases (ALS, Parkinson's, Alzheimer's diseases), most of our published work is in the study of polyglutamine repeats in Huntington's disease. In addition to a more classical biochemical approach to understanding the role of glutamine repeats in protein aggregation, we have moved our work towards a chemical biology approach, exploring *in vivo* aggregation, using two animal model systems: *Drosophila melanogaster* and *Caenorhabditis elegans*. We are interested in the polyQ length dependence, and mechanisms of mitigation, of aggregation, using a variety of biochemical probes, including analytical ultracentrifugation with fluorescence detection capabilities. Our most recent work is moving more towards the understanding of how long-lived life forms (trees) manage the problems of protein aggregation (they do much better than animals), and then applying principles from plants to propose ways to better mitigate diseases in humans due to this problem of protein misfolding and aggregation.

NAMES OF SENIOR RESEARCH ADVISEES

2024 Kinnan Abdalhamid, Maya Cheam, Maria Danial, Samantha Gonzalez, Sakina Gulamhusein, Téa Kuzbari
2023 Leah Barz-Snell, Taliyah Evans, Fatima Faheem, Nikki Farrell, Hallie Kern, Matthias Langer, Kelsey Mabry, Mata Ngochanthra
2022 Allison Dockman, Matt Hogenauer, Madison Hujber, Lauren Kinne, Alex May, Natalie Olivieri, Isabel Ray, Sarina Smith, Delaney Snowden, Tien Vu
2021 Nile Bayard, Maya Casey, Annette Lee, Genevieve Uy, Katherine Wass, Zakiyyah Winston, Karma Yang
2020 Madison Adore, Ash Arango, Lauren Nguyen, Yifan Zhang
2019 Rod Beale, Dennis Grencewicz, Sophia Nelson, Alexa Nolan
2018 Shayan Hashemi, Danielle Jacobsen, Nina Shah

2017 Alex Belfi, Helen Jung, Catheline Phan, Karl Vosatka, Zoe Wong
2016 Victoria D'Acunto, Alex Frost, Emily Krasnow, Sofia Tieze
2015 Tolani Babatunde, Noah Bloch, Christian Fagre, Jay Garcia, Jeanne Quinn
2014 Claire-Marie Caseau, Seema Doshi, Chris Gardner, Surin Kim
2013 Vin Dioguardi, Sue Hoffman, Mike Iannacone, Zach Rosenthal, Katie Ulrich
2012 Nabeel Akbhar, Sydney Hyder, Lynn Richmond, Zachary Smith, James Taggart
2010 Julia Durante, Sam McCrimons, Kara Percival, Grace Smith Vidaurre, Zoe Welch
2009 Grace Bundens, Adolfo Cuesta, Elizabeth Gallo, Jill Geratowski, Andrew Kim, Andrew McNeal, Haig Minassian, Brian Pepe-Mooney
2008 Kate Alfieri, Sarah Graves, Borin Kim, Justin Meyerowitz, Tim Miles, Mary Mulqueen, Rachel Oristano, Brian Pepe-Mooney
2007 Heidi Bretscher, Pier Hart, Andrew Kim, Tim Miles, Laurel Pellegrino, Ross Sager, Yao Yao
2006 Alan Ackroyd-Isales, Tim Miles, Sharon O'Neill, Claire Roden, Neha Rastogi, Molly Sheehan, Betty Tsang
2005 Linda Cendes, Elizabeth Graef, Ben Root, Nina Salinger, Melanie Smith, Sarah Steenbergen, Meg Twomey
2004 Katherine Hart, Brian Kovaric, Kevin Monahan, Ami Naik, Shilpa Narayanan
2003 Benjamin Gordon, Katherine Hart, Jeffrey Jopling, Kevin Monahan, Ethan Roland
2002 Emily Crawford, Judith Lin, Esi Nkyekyer, Catherine Seager, Daniel Wagner
2001 Emily Crawford, Caroline Dahlberg, Peter Law, Wheaton Little, Charles Phillips, Ambika Sohal, Andrew Wasson
2000 Caroline Dahlberg, Lawrence Lee
1999 Wasif Ali, Chollaratt Boonlarrpradab, Marcelline Ciuffreda, Lawrence Lee, Grant Nybakken, Amy Solan, Colynda Vu, Nathan Wright
1998 Marcelline Ciuffreda, Robert Eskuchen, Rachel Mosher, Ian Pitha-Rowe, Kiira Ratia, James Robblee, Karin Werner, Eric Wolpin
1997 T.J. Filip, Jaimie Goralnick, Kandice Gu, Peter Krecioch, Maria Lemos

TEACHING EXPERIENCE

Haverford College (1997-)

Biol100, What is Life?
Biol115, Exploring Biology
Biol125, Perspectives in Biology: Genetic Roil and Royal Families
Biol200, Cell Structure and Function
Biol201, Molecules, Cells, & Organisms
Biol220/203, Unlocking Key Concepts in Biology
Biol295/395/495, Crafting an Inclusive Biology Curriculum
Biol300, Laboratory in the Biochemistry of DNA and Proteins
Biol303/313, Structure and Function of Proteins
Biol314, Metabolic Basis of Disease
Biol357, Protein Design
Biol380, Independent Study for Juniors
Biol403, Senior Research Tutorial in Protein Folding and Design
Biol457, Advanced Topics in Protein Science
Biol480, Independent Study for Seniors
Biol493, Interdisciplinary Examinations of Biologically Significant Research
Biol499, Senior Department Studies
Bioc390/303, Laboratory in Biochemical Analysis
Chem101, General Chemistry II
Hlth398, The Science and Practice of Mindfulness
Neur398, Sr Thesis Neuroscience

Neur399, The Science and Practice of Mindfulness
University of Massachusetts (2003)

Analytical Ultracentrifugation workshop
UMDNJ (2003)

Analytical Ultracentrifugation workshop
Princeton University (2002,2004)

2 lectures for CHEM515, Biophysical Chemistry I
University of Pennsylvania (2001,2005)

3 lectures for BMB615, Proteins from the Ground Up
Stanford University (1984-1985)

Graduate Teaching Assistant, Biochemistry.