**EMORY UNIVERSITY SCHOOL OF MEDICINE**

**STANDARD CURRICULUM VITAE**

Revised: *07/30/21*

1. **Name:** Karmella A. Haynes, PhD
2. **Office Address:** Emory University
 Health Sciences Research Building (HSRB1)
 Room E154
 1760 Haygood Dr NE, Atlanta, GA 30322
**Telephone:**  404.727.0531
**Fax:**  404.727.9873
3. **E-mail Address:** kahayne@emory.edu
4. **Citizenship**: United States Citizen
5. **Current Titles and Affiliations**:
	1. Academic Appointments:
		1. Primary Appointments:
		Assistant Professor of Biomedical Engineering, Wallace H. Coulter Department of Biomedical Engineering
		Emory University School of Medicine, 2018 - present
6. **Previous Academic and Professional Appointments:**

Visiting Adjunct Professor of Biology, Biology Department, Davidson College, 2006 - 2008

Assistant Professor of Biomedical Engineering, School of Biological and Health Systems Engineering, Arizona State University, 2011 - 2018

Adjunct Professor of Biomedical Engineering, School of Biological and Health Systems Engineering
Arizona State University, 2018 - 2019

1. **Education**:

BS, Biology, Florida Agricultural and Mechanical University, Tallahassee, FL, 1995 - 1999

PhD, Molecular Genetics, Washington University, St. Louis, MO, 1999 - 2006

1. **Postgraduate Training**:

Postdoctoral Research Fellow, Department of Biology, Davidson College, Davidson, NC
Supervisor: A. Malcolm Campbell, PhD
2006 - 2008

Postdoctoral Research Fellow, Department of Systems Biology, Harvard Medical School, Boston, MA
Supervisor: Pamela A. Silver, PhD
2008 - 2011

1. **Committee Memberships:**
	1. National and International:
	2. Member, International Genetically Engineered Machines Competition (iGEM) Judges Committee, 2010 - present
	3. Member, Synthetic Biology Research Consortium (SynBERC) Board of Directors, 2015 - 2016
	4. Member and Diversity Director, Engineering Biology Research Consortium (EBRC) Council, 2016 - present
	5. Member, U.S. Army Synthetic Biology Roundtable Planning Committee, 2020 - 2021
	6. Member, National Science Advisory Board for Biosecurity (NSABB), 2021-2024
	7. Institutional:
	8. Member, Accreditation Board for Engineering and Technology (ABET) Committee, Arizona State University (ASU) Fulton Schools of Engineering (FSE), 2012
	9. Member, Fulton Undergraduate Research Initiative Application Review Committee, ASU FSE, 2012 - 2013
	10. Member, New Faculty Cohort Steering Committee, ASU FSE, 2012 - 2014
	11. Member, Departmental Seminar Committee, ASU FSE School of Biological and Health Systems Engineering (SBHSE), 2013 - 2014
	12. Member, Academic Standards Committee, ASU FSE, 2013 - 2017
	13. Member, Systems and Synthetic Biology Faculty Search Committee, ASU, 2013 - 2017
	14. Member, Molecular, Cellular and Tissue Bioengineering (MCTB) Committee, ASU FSE, 2014 - 2018
	15. Member, Synthetic Biology Working Group, ASU Office of Knowledge and Enterprise Development (OKED), 2015
	16. Coordinator, African American Faculty and Staff Association (AAFSA) Professional Development Committee, ASU, 2015 - 2018
	17. Member, BME Faculty Search Committee, GA Tech and Emory, 2019 - 2020
	18. Member, Biology Epigenetics Faculty Search Committee, Emory University, 2019 - 2020
	19. Faculty, Emory Winship Cancer Institute Cell and Molecular Biology Research Program, 2019 - present
	20. Member, Biomedical Engineering PhD Program Admissions Committee, GA Tech and Emory, 2019 - 2020
	21. Member, Biomedical Engineering Graduate Program Committee, GA Tech/ Emory, 2019 - 2020
	22. Faculty, Georgia Tech Bioengineering Graduate Program, 2020 - present
	23. Faculty, Parker H. Petit Institute for Bioengineering and Bioscience, Georgia Tech, 2020 - present
	24. Full Member, Emory Graduate Division of Biological and Biomedical Sciences (GDBBS), 2020 - present
2. **Peer Review Activities**:
	1. Grants:
		1. National and International:
			1. Undergraduate Science Education, Howard Hughes Medical Institute (HHMI), 2012
			2. NITROGEN, National Science Foundation (NSF), 2013
			3. Modeling and Analysis of Biological Systems (MABS), National Institutes of Health (NIH), 2013
			4. Joint Genome Institute (JGI), US Department of Energy (DOE), 2014 - 2018
			5. Molecular Genetics A (MGA), National Institutes of Health (NIH), 2017
			6. Biosystems Design, US Department of Energy (DOE), 2017
			7. CAREER, National Science Foundation (NSF), 2018
			8. Rosetrees Trust Interdisciplinary Prize, 2019
			9. Genomics, Computational Biology and Technology (GCAT), National Institutes of Health (NIH), 2020
			10. Molecular Genetics B (MGB), National Institutes of Health (NIH), 2020
			11. Canada Foundation for Innovation, 2020
			12. CAREER Systems and Synthetic Biology (SSB), National Science Foundation (NSF), 2020
			13. Innovative Molecular Analysis Technologies (IMAT), National Institutes of Health (NIH), 2021
		2. Regional:
			1. Villanova College Research Support Grants, 2014
			2. University of North Carolina Research Opportunities Initiative (ROI), 2018
			3. Inter-institutional Planning Grant Program, UNC General Administration, 2018
			4. Advanced Laureate Awards, Irish Research Council, 2018
	2. Manuscripts:
		1. *Nucleic Acids Research*, 2012 - 2020
		2. *ACS Synthetic Biology*, 2014 - 2020
		3. *Systems and Synthetic Biology*, 2014
		4. *Nature Reviews Genetics*, 2014
		5. *Nature Chemical Biology*, 2014
		6. *Cell Systems*, 2015
		7. *FEBS Letters*, 2017
		8. *Engineering Biology*, 2017
		9. *International Journal of Molecular Sciences*, 2019
		10. *Journal of Molecular Biology*, 2019
		11. *Molecular Therapy*, 2019
	3. Conference Abstracts:
		1. National and International:
			1. Synthetic Biology: Engineering, Evolution & Design (SEED), Abstract Reviewer, 2015, 2019
			2. Division of Biochemical Technology (BIOT) 257th ACS National Meeting, Abstract Reviewer, 2018
3. **Consultantships/Advisory Boards:**
	1. Consultant, Institute on Science for Global Policy, Tucson, AZ, 2012
	2. Consultant for Student Biotech Projects, Alberta Innovates, Alberta, Canada, 2012 - 2016
	3. Consultant for Biocontainment Strategies, J. Craig Venter Institute, Rockland, MD, 2013
	4. Consultant for Roadmapping, Center for Research and Interdisciplinarity, Paris, France, 2017
	5. Consultant, Square Table-2: National Science Foundation (NSF) Programmable Interfaces: Exploring the Intersection of Synthetic Biology, Biomaterials, and Soft Matter, 2019
4. **Editorships and Editorial Boards:**
	1. Associate Editor, *Frontiers in Bioengineering and Biotechnology*, 2015
	2. Editorial Board, *Epigenetics Insights*, 2018 - present
	3. Editorial Board, *Nucleic Acids Research*, 2019 - present
	4. Board of Reviewing Editors, *eLife*, 2020 - present
	5. Guest Editor, *Journal of Regenerative Engineering & Translational Medicine* (ISSN 2364-4141), 2021
5. **Honors and Awards:**
	1. Fellowship, Synthetic Biology Leadership Accelerator (SynBio LEAP) Program, 2012
	2. Outstanding Assistant Professor Award, ASU School of Biological and Health Systems Engineering, 2017
	3. Featured Engineer Profile, The Ella Project, 2018
	4. Cell Mentor (Cell Press) 1,000 inspiring Black Scientists in America, 2020
	5. COLOR Magazine Women of Color: Innovator in STEM award, 2021
6. **Society Memberships:**
	1. Councilor, Institute for Biological Engineering (IBE), 2011 - 2013
	2. Member, American Society for Biochemistry and Molecular Biology (ASBMB), 2011 - present
	3. Member, American Society for Cell Biology (ASCB), 2017 - present
	4. Member, American Institute of Chemical Engineers (AIChE) Society for Biological Engineering (SBE), 2018 - present
	5. Member, National Society of Black Engineers (NSBE), 2019 - present
7. **Organization of Conferences:**
	1. National and International:
		1. Administrative Positions:
			1. Member, Organizing Committee, 7th International Meeting on Synthetic Biology (SB7.0), 2017
			2. Chair, Organizing Committee, Synthetic Biology: Engineering, Evolution and Design (SEED), 2018
			3. Member, Organizing Committee, 2nd Epigenetics and Bioengineering Conference (EpiBio 2018), 2018
			4. Member, Organizing Committee, Synthetic Biology: Engineering, Evolution and Design (SEED), 2019
			5. Member, Organizing Committee, 3rd Epigenetics and Bioengineering Conference (EpiBio 2019), 2019
			6. Chair and Founder, AfroBiotech Conference, 2019 - 2021
			7. Member, Organizing Committee, Synthetic Biology: Engineering, Evolution & Design (SEED), 2021
			8. Co-Chair, Epigenetics and Bioengineering Conference (EpiBio), 2021
		2. Sessions as Chair:
			1. Chair, 6th International Conference on Synthetic Biology (SB6.0), Making and Using Standards, 2013
			2. Chair, Biomedical Engineering Society (BMES) Annual Meeting, Cell and Molecular Bioengineering: Systems Biology, 2014
			3. Chair, 257th ACS National Meeting Division of Biochemical Technology (BIOT) Upstream Processes Symposium, Mammalian: Media and Metabolism, 2019
			4. Sensing and Signaling within Multicellular Synthetic Biology, Synthetic Biology: Engineering, Evolution and Design (SEED), 2019
			5. Writing Epigenetic Modifications, Epigenetics and Bioengineering Conference (EpiBio), 2019
			6. Cellular and Molecular Bioengineering Track, Biomedical Engineering Society (BMES) Annual Meeting, 2021
	2. Regional:
		1. Administrative Positions:
			1. Member, Organizing Committee, Molecular, Cellular and Tissue Bioengineering (MCTB) Symposium, 2016
			2. Chair, Organizing Committee, Molecular, Cellular and Tissue Bioengineering (MCTB) Symposium, 2017
8. **Community Outreach:**
	1. General:
		1. Public Seminar “Adults' Night Out: Stem Cells,” Arizona Science Center, 2012
		2. Public Seminar “New Frontiers in Medical Science: From Copying Life to Building Life," Arizona Science Center, 2013
		3. Synberc Capitol Hill Briefing "Sustaining U.S. Leadership in Biotech," Washington, DC, 2014
		4. Public Seminar "Unbelievable Biomed," Arizona Science Center, 2014
		5. Multi-site Public Engagement in Science: Synthetic Biology, Boston Museum of Science, 2014
		6. ASU Center for Science and the Imagination, "Splice and Synthetic Biology's Monsters" Video Project, SIFF Film Center Seattle, 2015
		7. Hidden Figures Movie Screening and Panel, 100 Black Women Phoenix Metro Chapter, 2017
		8. SciGirls Virtual Coding Camp, 2021
	2. Media Appearances:
		1. The Scientist - Scientist to Watch, “Karmella Haynes: Turning the Dials,” 2013
		2. National Science Foundation Media Advisory, “Learn the latest on synthetic biology at a June 26 Capitol Hill briefing,” 2014
		3. Discover Magazine: Discover Events, “Sustaining U.S. Leadership in Biotech,” 2014
		4. People Behind the Science Podcast, “Dr. Karmella Haynes: Expressing Her Creativity Making Epigenetic Machinery and Designing Biological Devices,” 2015
		5. Public Radio International Science Friday, “Just How Easy Is It to Edit DNA?” 2016
		6. Genemods Podcast, “Chr-Ho Ho Ho-matin with Professor Karmella Haynes,” 2017
		7. Benchtalk Magazine, "Spotlight - Karmella Haynes: Synthetic Biologist, Artist, Advocate, and Ultimate Puzzle Solver," 2019
		8. GROW Magazine, "The Cell Conductor," 2020
		9. NOVA/ PBS, “Gene Editing Reality Check,” 2020
		10. Forbes, “A New Approach To A Deadly Breast Cancer Offers Hope To The Black Women It Affects Most,” 2020
		11. Haynes KA, Yau C, Bild A, Laughney A, Morsut L, Yang X, Zaugg J, Hsu P, Pancaldi V, Iyer-Biswas S. “How Has the COVID-19 Pandemic Changed How You Will Approach Research and Lab Work in the Future?” Cell Systems Voices, 2020, 11:550-554.
		12. Epigenetics Podcast from Active Motif Episode 52: Synthetic Chromatin Epigenetics
9. **Formal Teaching:**
	1. Graduate Programs:
		1. Fellowship Programs:
			1. Instructor and Founder, Synthetic Biology Summer Course, Cold Spring Harbor Laboratory, 2013 - 2018, 40 hours/weeks for 2 weeks
		2. Master’s and PhD Programs:
			1. Professor, Master’s Applied Projects (BME593), Arizona State University (ASU), 2012 - 2016, 3 hours/week
			2. Professor, Advanced Synthetic Biology (BME598), ASU, 2012, 3 hours/week
			3. Professor, Molecular Synthetic Biology (BME494/598), ASU, 2014 - 2018, 3 hours/week
			4. Guest lecturer, Mechanical Engineering (ME 3141), Georgia Tech (online), Spring 2020, 1 hour
			5. Guest lecturer, Biomedical Systems and Modeling (BME 3520), Georgia Tech (online), Spring 2020, 1 hour
			6. Guest lecturer, Project ENGAGES, Georgia Tech (online), Spring 2020, 1 hour
			7. Professor, Advanced Seminar: Cellular and Biomolecular Engineering (BMED 7301), Georgia Tech (online), Summer 2020, 4 hours/week
			8. Guest lecturer, Principles of Cancer Biology I (CB533/ IBS524), Emory University (online), Fall 2020, 3 hours
			9. Guest Instructor (virtual), BIOS 313 Experimental Synthetic Biology undergrad course, Rice University, 2020, 1 hours/week for 6 weeks
10. **Supervisory Teaching:**
	1. Undergraduate Thesis Students Directly Supervised
		1. Keith Dyson, BS, 2012
		2. Joseph Flay, BS, 2012
		3. Daniel Gary, BS, 2012
		4. Madeline Grade, BS, 2012
		5. Ryan Muller, BS, 2015
		6. Cameron Gardner, BS, 2015
		7. David Barclay, BS, 2016
		8. Jan Simper, BS, 2016
		9. Paige Steppe, BS, 2021
		10. Lauren Hong, BS, 2022
		11. Chavis Ferguson, BS 2021, University of Missouri
	2. Masters Students Directly Supervised:
		1. Behzad Damadzadeh, MS, 2012 - 2014
		Associate Scientist, Astrazeneca
		2. Fatima Hamna, MS, 2018 - 2019
		3. Daniel Vargas, MS, 2015 - 2019
		Clinical Molecular Technologist, Castle Biosciences
	3. PhD Students Directly Supervised:
		1. Rene Daer, PhD, 2012 - 2017
		Research Scientist, Progenity Inc.
		2. Cassandra M. Barrett, PhD, 2015 - 2019
		Genetic Counseling Masters student, University of Utah
		3. Stefan J. Tekel, PhD, 2015 - 2019
		Strain Engineer, Sustainable Conversion Ventures
		4. Cara Shields, PhD, 2020 - present
		5. Kierra Franklin, PhD, 2020 - present
	4. Postdoctoral Fellows Directly Supervised
		1. Isioma Enwerem, postdoc, 2020 - present
	5. Thesis Committees:
		1. Rebecca McKenna, ASU Chemical Engineering PhD, 2014
		2. Taraka Sai Pavan Grandhi, ASU Biomedical Engineering PhD, 2016
		3. Matthew Christensen, ASU Chemical Engineering PhD, 2016
		4. Fuqing Wu, ASU Biomedical Engineering PhD, 2017
		5. Karan Syal, ASU Biological Design PhD, 2017
		6. David Menn, ASU Biomedical Engineering PhD, 2018
		7. Michael Machas, ASU Biomedical Engineering PhD, 2019
		8. Jessica Lin, Emory/ GA Tech Biomedical Engineering PhD, 2019 - present
		9. Kalifa Shabazz, Emory Genetics and Molecular Biology MS, 2020
		10. Haotian Gao, Center for Research and Interdisciplinarity (CRI) Paris PhD, 2020
		11. Luke Knudson, Emory Cell Biology PhD, 2020
	6. Other:
		1. ASU iGEM Team (Abhinav Markus, Hyder Hussain, Amanda Ispas, Ryan Muller, Rohit Rajan, Nisarg Patel, Ellen Qin, Madeline Sands, Ethan Ward), International Genetically Engineered Machines summer research, Arizona State University, 2012
		2. ASU iGEM Team (Abhinav Markus, Hyder Hussain, Nathan Palmer, Ryan Muller, Nisarg Patel, Julia Smith, Rohit Rajan, Joseph Yun), International Genetically Engineered Machines summer research, Arizona State University, 2013
		3. ASU iGEM Team (Scott Ashmore, David Reynolds, Vallari Somayaji, Michael Waddington, Mathew Ykema), International Genetically Engineered Machines summer research, Arizona State University, 2014
		4. ASU iGEM Team (Brady Dennison, Brittany Flores, Ernesto Luna, Rob Schultz, Jiaqi Wu, Jimmy Xu), International Genetically Engineered Machines summer research, Arizona State University, 2016
		5. ASU iGEM Team (Xylaan Livingstone, Amber Mani, Chris Connot, Christina Smith, Briana Lopez), International Genetically Engineered Machines summer research, Arizona State University, 2017
		6. Bhoomika Reddy, ASU-PES University Summer Exchange Program, Arizona State University, 2017
11. **Lectureships, Seminar Invitations, and Visiting Professorships:**
	1. National and International:
		1. 3rd US-Turkey Advanced Study Institute on Global Healthcare Challenges, "Advances in Synthetic Biology," July 10, 2012, Antalya, Turkey
		2. Workshop on Research Agendas in the Societal Aspects of Synthetic Biology, "Opening Plenary: What Kind of Work Do We Want?" November 4, 2014, Tempe, AZ
		3. 2nd International Synthetic and Systems Biology Summer School (SSBSS), "Designing CRISPR for the Engineering of DNA in Mammalian Cells," July 5, 2015, Taormina, Sicily, Italy
		4. NCI Synthetic Biology Approaches to Cancer Systems Workshop, "Teaching Synthetic Transcription Factors to Read the Histone Code in Human Cancer Cells," February 16, 2016, Rockville, MD
		5. Charting Future Paths of Open Synthetic Biology, “Engineering the Human Genome as Chromatin,” October 5, 2017, Paris, France
		6. NIH CSSI Science Day, “Engineered Chromatin to Support Epigenetic Research and Drug Development for Cancer,” June 7, 2018, Bethesda, MD
		7. Cold Spring Harbor Summer Course: Synthetic Biology, “Chromatin Epigenetic Engineering in Triple Negative Breast Cancer,” July 23, 2019, Cold Spring Harbor, NY
		8. Black in Nanotechnology Week, "Engineering chromatin proteins to regulate genes in triple negative breast cancer," December 9, 2020, online live
	2. Regional:
		1. What You Can Be With a Ph.D: Navigating Interdisciplinary Research In Engineering and Life Sciences, "Innovative Research," February 1, 2014, Decatur, GA
		2. Monsanto Science Fellows Symposium, “Teaching Synthetic Transcription Factors to Read the Histone Code,” April 14, 2016, St. Louis, MO
		3. NSURP BIPOC Seminar Series, "Gene surgery with CRISPR on your home computer," August 4, 2020, onlive live
	3. Institutional:
		1. ASU School of Biological and Health Systems Engineering Seminar Series, “Rewiring the Histone Code With Synthetic Biology," October 21, 2011, Tempe, AZ
		2. UNC Charlotte Bioinformatics Seminar Series, "No More Magic Bullets: Combining Synthetic Biology With Bioinformatics for Engineering Medicine," February 24, 2012, Chapel Hill, NC
		3. Davidson College Science Pipeline ConNEXTion, "Innovative Research Science – Rewards of Not Playing It Safe," April 5, 2013, Davidson, NC
		4. MIT Synthetic Biology Working Group, “Engineering of Human Chromatin,” October 30, 2014, Boston, MA
		5. Cold Spring Harbor Summer Course: Synthetic Biology, “Synthetic Chromatin in Human Cells,” August 4, 2016, Cold Spring Harbor, NY
		6. Lawrence University Recent Advances in Biology Lecture Series, "In Vitro Development of Synthetic Chromatin Proteins That Function in Live Cells," April, 10, 2017, Appleton, WI
		7. Harvard Systems Biology Retreat, “Chromatin Engineering: From Protein Motifs to Whole Genome Analysis,” June 8, 2017, Phippsburg, ME
		8. UC Irvine Biomedical Engineering Lecture Series, “In Vitro Development of Chromatin-Based Biologics for Breast Cancer,” October 20, 2017, Irvine, CA
		9. BNAAC University of Illinois Urbana-Champaign Lecture, “A Synthetic Biology Approach to Epigenetic Therapy for Cancer,” March 2, 2018, Champaign, IL
		10. UCLA Bioengineering Department Seminar Series, “A Pipeline to Engineer Synthetic Epigenetic Proteins Derived From Chromatin,” May 17, 2018, Los Angeles, CA
		11. Mayo Clinic Research Seminar Series, “Engineered Chromatin Systems to Support Epigenetic Therapy of Cancer,” May 24, 2018, Scottsdale, AZ
		12. Fred Hutchinson Cancer Research Center Current Biology Seminar Series, “Investigating the Behavior and Impact of Rationally-Designed Histone 'Readers' in the Context of Cancer Epigenomes,” October 2, 2018, Seattle, WA
		13. UCSC Molecular, Cell and Developmental Biology Department Seminar Series, "Development and Application of Synthetic Chromatin-Binding Proteins for Cell Biology Research," November 3, 2018, Santa Cruz, CA
		14. Biomedical Engineering Seminars at Emory, "Chromatin Engineering for Macrogenomic Control of Transcription in Triple Negative Breast Cancer," April 19, 2019, Atlanta, GA
		15. UGA Department of Genetics Seminars, "Challenges and Opportunities for Epigenetic Engineering in Triple Negative Breast Cancer," November 13, 2019, Athens, GA
		16. UCSD Quantitative Biology Seminar Series, "Chromatin epigenetic engineering: combining synthetic biology with molecular bioinformatics," January 27, 2020, San Diego, CA
		17. Davidson College Genomics Program Seminar Series, "Genomic analysis to achieve multi-gene regulation by chromatin design," February 10, 2020, Davidson, NC
		18. Rensselaer Polytechnic Institute Department of Chemical and Biological Engineering Seminar Series, "Human chromatin epigenetic engineering guided by evolutionary biology," November 11, 2020, online live
		19. University of Washington Department of Biochemistry Seminar Series, "Leveraging chromatin to activate tumor suppressors in triple negative breast cancer," November 17, 2020, online live
		20. Oxford University Synthetic Biology Society Seminar Series, "Using engineered chromatin proteins to fill gaps in epigenetic therapy," December 7, 2020, online live
		21. UCSF Biochemistry & Biophysics Department Seminar Series, "Engineering chromatin proteins to activate dormant tumor suppressor genes," January 5, 2021, online live
		22. UCSF Behind the Science Seminar Series, "Behind the Science: Dr. Karmella Haynes," January 8, 2021, online live
		23. California State University East Bay Department of Biological Sciences Research Seminar Series, "Chromatin engineering to control genes in triple negative breast cancer," February 16, 2021, online live
		24. Synthego, "Fireside Chat About Diversity Equity and Inclusion," February 18, 2021, online live
		25. University of Louisville Department of Biochemistry Seminar Series, "Synthetic effectors: thinking beyond chromatin editors for cancer epigenetic therapy," March 1, 2021, virtual
		26. Northwestern University Center for Synthetic Biology Seminar Series, "Chromatin engineering for epigenetic therapy in triple negative breast cancer," March 9, 2021, online live
		27. UC Berkeley Department of Molecular and Cellular Biology Marian E. Koshland Seminar Series, "Engineering chromatin reader-effectors for epigenetic engineering in breast cancer," April 16, 2021, online live
12. **Invitations to National/International, Regional, and Institutional Conferences:**
	1. National and International:
		1. 8th International Conference on Bioinformatics: From Genomics to Synthetic Biology, “Rewiring the Histone Code With Synthetic Biology,” November 2011, Atlanta, GA
		2. Synthetic Biology Engineering Research Center (SynBERC) Fall 2012 Retreat, “Synthetic Epigenetics for Mammalian Cell Engineering,” September 21, 2012, Cambridge, MA
		3. Synthetic Biology Engineering Research Center (SynBERC) Spring 2013 Retreat, “Contextual Behaviour of a Synthetic Chromatin Protein,” March 25, 2013, San Francisco, CA
		4. 7th International Structural Biology and Functional Genomics Conference, "Synthetic Chromatin for Engineering Multicellular Systems," December 5, 2013, Singapore
		5. Synthetic Biology Engineering Research Center (SynBERC) Fall 2013 Retreat, "Epigenetic Control of Pancreatic Cells with DNA-Packing Sensors and Actuators," September 28, 2013, Boston, MA
		6. 2014 Keck Annual Research Conference: Quantitative Synthetic Biology, "Foundations for the Engineering of Human Chromatin," November 7, 2014, Huston, TX
		7. 3rd Cold Spring Harbor Asia Conference on Synthetic Biology, "Foundations for the Engineering of Human Chromatin," December 4, 2014, Suzhou, China
		8. 2nd International Mammalian Synthetic Biology Workshop (MSB 2.0), “Regulating Human Cancer Epigenomes With Synthetic Chromatin,” April 25, 2015, Boston, MA
		9. Epigenetics Gordon Research Conference, “Epigenetic Engineering of Human Cells with Fusion Proteins,” August 6, 2015, Waltham, MA
		10. GTC Bio Epigenetic Enzymes in Drug Discovery, "Synthetic Transcription Factors that Read The Histone Code," March 2, 2016, San Diego, CA
		11. 3rd Synthetic Biology Congress, “Controlling Gene Expression With Synthetic Histone-Binding Proteins,” October 20, 2016, London, UK
		12. 7th International Meeting on Synthetic Biology (SB7.0), “Chromatin Engineering for Human Health,” June 14, 2017, Singapore
		13. Engineering Biology Research Consortium (EBRC) 2017 Fall Retreat, "In Vitro Development of Synthetic Chromatin Effectors for Breast Cancer," September 22, 2017, Atlanta, GA
		14. 2017 Southeastern Regional Meeting of the ACS (SERMACS), "Manipulation of chromatin to enhance CRISPR activity," November 9, 2017, Charlotte, NC
		15. 1st Epigenetics and Bioengineering Conference, “Synthetic Readers and Writers of Chromatin to Advance Cell Engineering,” December 13, 2017, Miami, FL
		16. Engineering Biology Research Consortium (EBRC) 2018 Fall Retreat, "BifC-PD: Fluorescent Sensors to Illuminate the Impact of Chromatin on the Nuclear Uptake and Expression of Recombinant DNA," September 14, 2018, Fort Collins, CO
		17. 2nd Epigenetics and Bioengineering Conference, “Histone-Binding Domains as Modules for Custom Fusion Proteins,” October 6, 2018, San Francisco, CA
		18. Telluride Workshop on Physical Genomics and Transcriptional Engineering, "Synthetic histone reader-effectors as agents for macrogenomic engineering," February 25, 2019, Telluride, CO
		19. Chromatin and Epigenetics: Inheritance and Design, "Synthetic Reader-Effectors for Epigenetic Reprogramming of Genes in Cancer," April 1, 2019, Munich, Germany
		20. Synthetic Biology: Engineering, Evolution and Design (SEED), "Epigenetic engineering in triple negative breast cancer," June 26, 2019, New York, NY
		21. 3rd International Conference on CRISPR Technologies (ICCT), "Inhibition and recovery of CRISPR/spCas9 activity at closed chromatin in a human cell line," September 17, 2019, Wurzburg, Germany
		22. 2019 TERMIS-Americas Annual Conference, "Applying Multi-Cellular Engineered Living Systems (M-CELS) Ethics in the Lab," December 4, 2019, Orlando, FL
		23. 2020 PepTalk Conference, "A Nuclear Genetic Sensor to Measure and Optimize Delivery of Non-Viral DNA into Human Cells," January 20, 2020, San Diego, CA
		24. Black in Nanotechnology Week, "Engineering chromatin proteins to regulate genes in triple negative breast cancer," December 9, 2020, online live
		25. 4th International Conference on Epigenetics and Bioengineering (EpiBio), "Engineering transcription factors that sense histone modifications in cancer cells," October 10, 2020, online live
		26. 2020 American Institute for Chemical Engineers (AIChE), "Epigenetic Engineering to Target an Anti-Cancer Gene Module in Breast Cancer," November 18, 2020, virtual
		27. Society of Women Engineers Women in Academia Committee Seminar Series, "Service and Strategy: The Value of Conference Committees and Public Engagement for Early Tenure-Track Faculty," February 11, 2021, online live
		28. Mammalian Synthetic Biology Workshop 7.0, "Silencing Panel," July 21, 2021, online live
	2. Regional:
		1. Purdue University Student Pugwash Midwest Regional Conference, “Synthetic Biology With Standardized Parts,” March 30, 2012, West Lafayette, IN
		2. ASU Molecular, Cellular and Tissue Bioengineering Symposium, “In Vitro Development of Synthetic Chromatin Proteins That Function in Live Cells,” April 1, 2017, Phoenix, AZ
		3. Georgia-Alabama Louis Stokes Alliance Minority Participation (GA-AL LSAMP) Conference, "Keynote: Next-Level Gene Engineering to Study and Fight Cancer," April 6, 2019, Atlanta, GA
	3. Institutional:
		1. University of Oregon Engineering Biomolecules Mini-Symposium, “Drugging the Cancer Epigenome with Synthetic Chromatin-based Proteins,” June 22, 2018, Eugene, OR
		2. UMSL Basic to Biotech Symposium, "Using Engineered Proteins to Control Genes in Hard-to-Treat Cancer Cells," November 8, 2019, St. Louis, MO
		3. Rice University Department of Bioengineering Colloquium, "Epigenetic co-regulation of genes with engineered sensor-actuator proteins," November 10, 2020, online live
		4. University of Pennsylvania 2021 Bioengineering Graduate Student Symposium, "Keynote: Cancer epigenetic therapy meets chromatin epigenetic engineering," January 12, 2021, online live
13. **Abstract Presentations at National/International, Regional, and Institutional Conferences:**
	1. National and International:
		1. **Haynes KA.\*** ASCB 2011 Annual Meeting, "Rewiring the Histone Code Using Synthetic Effectors," December 4, 2011, Denver, CO (oral presentation)
		2. Hom C, Damadzadeh B, Barclay D, **Haynes KA.\*** Engineering chromatin with DNA-packing Actuators and Sensors. Biomedical Engineering Society (BMES) 2014 Annual Meeting, San Antonio, TX, 2014 (oral presentation)
		3. Hom C, Gardner C, **Haynes KA.\*** Manipulating Human Chromatin With Synthetic Proteins. 2015 Annual Conference of the Institute for Biological Engineering, St. Louis, MO, 2015 (oral presentation)
		4. Nyer DB, Vargas D, **Haynes KA.\*** Teaching Synthetic Transcription Factors to Read an Epigenetic Code. 2016 Synthetic Biology: Engineering, Evolution & Design (SEED), Chicago, IL, 2016 (oral presentation)
		5. Tekel S, Vargas D, **Haynes KA.\*** In Vitro Development of Synthetic Chromatin Proteins That Function in Live Cells. American Society for Biochemistry and Molecular Biology (ASBMB) 2017 Annual Meeting, Chicago, IL, 2017 (oral presentation)
14. **Research Focus:**

My research has focused on investigating the function of chromosome structures (chromatin) and applying this knowledge to engineer gene-regulation systems. For the past seven years, I have focused on synthetic biology. I have developed fusion proteins that target aberrant chromatin and activate therapeutic genes in cancer cells.

1. **Patents:**
	1. Pending:
		1. The Synthetic Histone-Binding Regulator Protein PcTF Activation of Cell Growth Suppression, U.S., Application #62/655,709/M18-188L, 2018
		2. Synthetic Transcription Factors that Bind Modified Histones, U.S., Application #62/630,352/M18-129L, 2018
		3. Manipulation of DNA Packing to Enhance and Suppress CRISPR/Cas9-Mediated Genome Editing in Human Cells, U.S., Application #62/553,325/M18-226L, 2018
2. **Grant Support:**
	1. Active Support:
		1. Federally Funded:
			1. PI, National Institutes of Health NCI, *Predictable control of gene regulation through epigenetic engineering*, R21, $179,671, 2 years
		2. Other:
			1. PI, Wallace H. Coulter Department of Biomedical Engineering, *Murine Model to Identify Epigenetic Mediators of Obesity-associated Drug Resistance in Triple Negative Breast Cancer*, Seed grant: Animal Model Development to Study Mechanisms of Health Disparities, $25,000, 1 year
			2. PI, Genentech Research Award Program, $50,000, 1 year
			3. Co-PI, Aflac/ Emory Cancer and Blood Disorders Program, *Delineating the Impact of Anti-Galectin-9 immunotherapy on T-cell ALL Epigenetics and Survival*, CURE Childhood Cancer Pilot Funding Mechanism, $75,000, 1 year
	2. Previous Support:
		1. PI, National Science Foundation SynBERC, *Epigenetic control of pancreatic cells with DNA-packing sensors and actuators*, Sub-Award, $142,745, 2 years
		2. PI, National Institutes of Health NCI, *Synthetic chromatin for cancer research*, K01 Research Scientist Development Award, $474,443, 3 years
		3. PI, Arizona Department of Health Services, *Synthetic biology for cancer research*, Arizona Biomedical Research Commission Early Stage Investigator Award, $225,000, 3 years
		4. PI, ASU Foundation Women and Philanthropy, *SB.ASU – Sharing DNA Materials to Build Medical Innovations*, $75,257, 1 year
		5. Co-PI, National Science Foundation CBET, *Manipulating epigenetic mechanisms to enhance non-viral transgene expression*, Standard Grant, $426,386, 5 years
3. **Bibliography:**
	1. Published and Accepted Research Articles (clinical, basic science, other) in Refereed Journals:
		1. Sun FL, **Haynes K**, Simpson CL, Lee SD, Collins L, Wuller J, Eissenberg JC, Elgin SC. cis-Acting determinants of heterochromatin formation on Drosophila melanogaster chromosome four. *Mol Cell Biol*, 2004: 24:8210-8220.
		2. **Haynes KA**, Caudy AA, Collins L, Elgin SC. Element 1360 and RNAi components contribute to HP1-dependent silencing of a pericentric reporter. *Curr Biol*, 2006: 16:2222-2227.
		3. **Haynes KA**, Gracheva E, Elgin SC. A Distinct type of heterochromatin within Drosophila melanogaster chromosome 4. *Genetics*, 2007: 175:1539-1542.
		4. Riddle NC, Leung W, **Haynes KA**, Granok H, Wuller J, Elgin SC. An investigation of heterochromatin domains on the fourth chromosome of Drosophila melanogaster. *Genetics*, 2008: 178:1177-1191.
		5. **Haynes KA**, Broderick ML, Brown AD, Butner TL, Dickson JO, Harden WL, Heard LH, Jessen EL, Malloy KJ, Ogden BJ, Rosemond S, Simpson S, Zwack E, Campbell AM, Eckdahl TT, Heyer LJ, Poet JL. Engineering bacteria to solve the Burnt Pancake Problem. *J Biol Eng*, 2008: 2:8.
		6. **Haynes KA**, Silver PA. Synthetic reversal of epigenetic silencing. *J Biol Chem*, 2011: 286:27176-27182.
		7. Boyle PM, Burrill DR, Inniss MC, Agapakis CM, Deardon A, DeWerd JG, Gedeon MA, Quinn JY, Paull ML, Raman AM, Theilmann MR, Wang L, Winn JC, Medvedik O, Schellenberg K, **Haynes KA**, Viel A, Brenner TJ, Church GM, Shah JV, Silver PA. A BioBrick compatible strategy for genetic modification of plants. *J Biol Eng*, 2012: 6:8.
		8. **Haynes KA**, Ceroni F, Flicker D, Younger A, Silver PA. A sensitive switch for visualizing natural gene silencing in single cells. *ACS Syn Biol*, 2012: 1:99-106.
		9. Elmer JJ, Christensen MD, Barua S, Lehrman J, **Haynes KA**, Rege K. The histone deacetylase inhibitor entinostat enhances polymer-mediated transgene expression in cancer cell lines. *Biotechnol Bioeng*, 2015: 113:1345-56.
		10. Daer R, Cutts JP, Brafman DA, **Haynes KA**. The impact of chromatin dynamics on Cas9-mediated genome editing in human cells. *ACS Syn Biol*, 2016: 6:428-438.
		11. Nyer DB, Daer R, Vargas D, Hom C, **Haynes KA**. Regulation of cancer epigenomes with a histone-binding synthetic transcription factor. *NPJ Genom Med*, 2017: 2:1.
		12. Tekel SJ, Vargas DA, Song L, LaBaer J, Caplan MR, **Haynes KA**. Tandem histone-binding domains enhance the activity of a synthetic chromatin effector. *ACS Syn Biol*, 2017: 7:842-852.
		13. Christensen MD, Nitiyanandan R, Meraji S, Davis R, Godeshala S, Goklany S, **Haynes KA**, Rege K. An inhibitor screen identifies histone-modifying enzymes as mediators of polymer-mediated transgene expression from plasmid DNA. *J Cont Rel*, 2018: 286:210-223.
		14. Tekel SJ, Barrett CM, Vargas DA, **Haynes KA**. Design, construction, and validation of histone-binding effectors in vitro and in cells. *Biochemistry*, 2018: 57:4707-4716.
		15. Daer R, Barrett CM, Melendez EL, Wu J, Tekel SJ, Xu J, Dennison B, Muller R, **Haynes KA**. Characterization of Diverse Homoserine Lactone Synthases in E. coli. *PLoS ONE*, 2018: 13:e0202294.
		16. Olney KC, Nyer DB, Vargas D, Wilson Sayres MA, **Haynes KA**. The synthetic histone-binding regulator protein PcTF activates interferon genes in breast cancer cells. *BMC Syst Biol*, 2018: 12:83.
		17. Tekel SJ, Smith CL, Lopez B, Mani A, Connot C, Livingstone X, **Haynes KA**. Engineered orthogonal quorum sensing systems for synthetic gene regulation. *Front Bioeng Biotech*, 2019: 7:80.
		18. Barrett CM, McCracken R, Elmer J, **Haynes KA**. Components from the human c-myb transcriptional regulation system reactivate epigenetically repressed transgenes. *Int J Mol Sci*, 2020: 21:530.
		19. Daer R, Hamna F, Barrett CM, **Haynes KA**. Site-directed targeting of transcriptional activation-associated proteins to repressed chromatin restores CRISPR activity. *APL Bioengineering*, 2020: 4:016102.
		20. Shields CE, Potlapalli S, Cuya-Smith SM, Chappell SK, Chen D, Martinez D, Pogoriler J, Rathi KS, Patel SA, Oristian KM, Linardic CM, Maris JM, **Haynes KA**, Schnepp RW. Epigenetic regulator BMI1 promotes alveolar rhabdomyosarcoma proliferation and constitutes a novel therapeutic target. *Mol Oncol*, 2021: doi: 10.1002/1878-0261.12914
	2. Manuscripts Submitted:
		1. Tekel SJ, Brookhouser N, **Haynes KA**. Delivery of cell-penetrating chromatin sensor-actuators to human osteosarcoma cells. bioRxiv, 2020 (preprint): <https://doi.org/10.1101/2020.02.28.969907>
		2. Shields CE, Schnepp RW, **Haynes KA**. Differential epigenetic effects of BMI1 inhibitor PTC-028 on fusion-positive rhabdomyosarcoma cell lines from distinct metastatic sites. (in review at J of Regen Eng and Transl Med)
		3. Enwerem-Lackland I, Warga E, Dugoni M, Elmer J, and **Haynes KA**. Targeted regulation of episomal plasmid DNA expression in eukaryotic cells with a 6meA-binding activator. (in review at J of Regen Eng and Transl Med)
		4. Lee M, Geitgey D, **Haynes KA**, Henry CJ. Adipocyte-induced epigenetic deregulation in T-ALL cells extends survival in obese murine model. (in review at Front Cell Dev Biol)
	3. Review Articles:
		1. **Haynes KA**, Leibovitch BA, Rangwala SH, Craig C, Elgin SC. Analyzing heterochromatin formation using chromosome 4 of Drosophila melanogaster. *Cold Spring Harb Symp Quant Biol*, 2004: 69:267-72.
		2. **Haynes KA**, Broderick ML, Brown AD, Butner TL, Harden L, Heard L, Jessen E, Malloy K, Ogden B, Rosemond S, Simpson S, Zwack E, Campbell AM, Eckdahl T, Heyer LJ, Poet JL. Computing with living hardware. *IET Synth Biol*, 1:44-47.
		3. **Haynes KA**, Silver PA. Eukaryotic systems broaden the scope of synthetic biology. *J Cell Biol*, 2009: 187:589-596.
		4. Moe-Behrens G, Davis R, **Haynes KA**. Preparing synthetic biology for the world. *Front Microbiol*, 2013: 4:5.
		5. Davis R, Muller R, **Haynes KA**. Can the natural diversity of quorum sensing advance synthetic biology? *Front Bioeng Biotechnol*, 2015: 3:30.
		6. Ceroni F, Carbonell P, François J-M, **Haynes KA**. Synthetic Biology: Engineering Complexity and Refactoring Cell Capabilities. *Front Bioeng Biotechnol*, 2015: 3:120.
		7. **Haynes KA**. Synthetic Biology: Building genetic containment. *Nature Chem Biol*, 2016: 12:55-56.
		8. Tekel SJ, **Haynes KA**. Molecular structures guide the engineering of chromatin. *Nuc Acids Res*, 2017: 45:7555-7570.
		9. Barrett C, **Haynes KA**. Unlocking access to DNA in chromatin. *Chem Eng Prog*, 2018.
		10. **Haynes KA**. Chromatin Research and Biological Engineering: An evolving relationship poised for new biomedical impacts. *Curr Opin Sys Biol*, 2019: 14:73-81.
		11. Baskin NL, **Haynes KA**. Chromatin engineering offers an opportunity to advance epigenetic cancer therapy. *Nature Struct Biol*, 2019: 26:842-845.
	4. Symposium Contributions:
		1. Silver PA, **Haynes KA**, Weiss R. Synthetic meets cell biology. *Mol Biol of the Cell*, 2012: 6:967.
	5. Book Chapters:
		1. Schofield D, Templar A, Borg Y, Daer R, **Haynes K**, Nesbeth D. Eukaryotae Synthetica: Synthetic Biology in Yeast, Microalgae, and Mammalian Cells. *Synthetic Biology Handbook* 2016. Nesbeth D ed. CRC Press. Pages 145-182.
		2. Priode JH, Haynes KA. Rapid Single-Pot Assembly of Modular Chromatin Proteins for Epigenetic Engineering. Protocols.io, 2021: <https://dx.doi.org/10.17504/protocols.io.brgcm3sw> (invited book chapter, Methods in Molecular Biology: DNA-Protein Interactions)
	6. Manuals, Videos, Computer Programs, and Other Teaching Aids:
		1. BME 100 Lab Workbook: DNA Labs, 2013 - 2018
		2. Cold Spring Harbor Laboratory Synthetic Biology Course Manual, 2014 - 2018
	7. Published Abstracts
		1. Barclay D, **Haynes KA**. A Synthetic Fusion Protein for Epigenetic Control of Pancreatic Cell Function. *Journal of Diabetes Science and Technology*, 2015: 9:342-485
		2. **Haynes KA**, Tekel SJ, Vargas DA. In Vitro Development of Synthetic Chromatin Proteins That Function in Live Cells. *FASEB Journal*, 2017: 31:lb1-1091.2
	8. Other Publications:
		1. **Haynes KA**. Incentive-driven Information Sharing for Engineering Biology. Synthetic Biology LeAP Strategic Action Plans Version 1, 2013
		2. **Haynes KA**. No one should be afraid of synthetic biology-produced vanilla. Slate Future Tense (online), 2014
		3. **Haynes KA**. Synthetic Biology and Sharing Big. Museums and Social Issues, 2016
		4. Stevens KR, Masters KS, Imoukhuede PI, **Haynes KA**, Setton LA, Cosgriff-Hernandez E, Bell MAL, Rangamani P, Sakiyama-Elbert SE, Finley SD, Willits RK, Koppes AN, Chesler NC, Christman KL, Allen JB, Wong JY, El-Samad H, Desai TA, Eniola-Adefeso O. Fund Black scientists. *Cell*, 2021: 184:561-565.
4. **Contributions Not Otherwise Noted:**
	1. National Institutes of Health, National Cancer institute, New Applications of Synthetic Biology to Cancer Research Challenges: 2020 Virtual Jumpstart