

Walton Malcolm Byrnes, PhD
Howard University College of Medicine
Associate Professor Emeritus
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Professional Positions and Experience

July 2025-present	Associate Professor Emeritus. Retired from Howard University on June 30, 2025.
July 2008-Jun 2025	Associate Professor, Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC
Spring 2010	Visiting Researcher, Kennedy Institute of Ethics, Georgetown University, Washington, DC
Oct 2001-July 2008	Assistant Professor, Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC ().
May 1999-April 2001	Research Scientist, Biochemical Science Division, Chemical Science and Technology Laboratory, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland
Aug 1996-May 1999	Assistant Professor, Department of Chemistry, University of Louisiana at Lafayette
Oct 1994-July 1996	Postdoctoral Researcher and Fellow (NIH Individual NRSA), Department of Molecular Medicine, College of Veterinary Medicine, Cornell University, Ithaca, New York
Aug 1988-Oct 1994	PhD Student, Department of Biochemistry, Louisiana State University, Baton Rouge
July 1984-June 1988	Chemistry Instructor at St. John's College in Belize City, Belize, Central America (1984-1986); Chemistry and Physics Teacher at Gonzaga College High School in Washington, DC (1986-1988)
Aug 1982-May 1984	Teaching Assistant for general chemistry lecture and biochemistry laboratory courses while a PhD student in physical chemistry (1982-1983) and biochemistry (1983-1984) at the University of Illinois at Champaign-Urbana
Aug 1981-May 1982	Analytical and Organic Chemistry Laboratory Instructor, Department of Chemistry, Xavier University of Louisiana, New Orleans, LA
Summer 1980	Undergraduate Summer Researcher in Theoretical Biophysical Chemistry at Argonne National Laboratory in Lemont, IL. Title of Project: "PS II Herbicide Binding Sites: A Theoretical Study of the Coulomb Potential Around Salt Bridges and Alpha Helices." Advisor: Les Shipman

Education

Postdoctoral Training and Fellowship. Cornell University, Ithaca, NY, United States (October 1994 - July 1996). Project Title: "The Agonist Site of Ionotropic Glutamate Receptor GluR6." Advisor: Robert E. Oswald

PhD, Biochemistry. Louisiana State University, 1994. Dissertation Title: "The Structural Basis for Kinetic and Allosteric Differences between Two Bacterial Phosphofructokinases." Dissertation available at: https://repository.lsu.edu/gradschool_disstheses/5859/ Advisor: Simon Chang.

BS, Chemistry (ACS Certified). Xavier University of Louisiana, 1981, *summa cum laude* (GPA 4.00), Honors in English.

Research and Scholarly Interests

- Kinetics and allosteric regulation of bacterial and archaeal metabolic enzymes, including phosphofructokinase (a glycolytic enzyme) and anthranilate synthase (a chorismate-utilizing tryptophan biosynthetic enzyme)
- The history of biology, particularly the scientific legacy of the early twentieth-century biologist Ernest Everett Just
- Bioethics; climate change and ecological ethics; the science-religion debate

Honors and Awards

Kenoth G. Adiyodi Memorial Keynote Lecturer at the Fifteenth International Congress for Invertebrate Reproduction and Development (ICIRD), American University, Washington, DC (June 2025).

Provost's Distinguished Service Award, Howard University. This was for my service on a three-member Program Prioritization Task Force (PPTF) "Peer Evaluation Team." We were tasked with evaluating a subset of the university's graduate programs (January 29, 2021).

Travel Award from the Howard University College of Medicine's Office of Faculty Development to attend the 6th International Conference of the Association of Biochemistry Educators (ABE) in Clearwater Beach, Florida, in May 2017.

E. E. Just Lecturer, The University of Chicago (November 2016).

Featured Scientist in the 2016 promotional booklet "Honoring the Legacy of Ernest Everett Just" published by the Maryland-based Ernest Everett Just Foundation, Inc. (EEJFI), located in Mitchellville, Maryland (2016).

Invited Speaker at the annual E. E. Just Scientific Symposium, Medical University of South Carolina in Charleston, South Carolina (February 2016).

Keynote Speaker at the annual Juneteenth Celebration and Biennial Bullard Award Ceremony, The Marine Biological Laboratory in Woods Hole, Massachusetts (June 2016).

Professionalism Recognition Award (for excellence in teaching), Howard University College of Pharmacy (2014).

Howard University Faculty Merit Award, Howard University (2006).

Howard University Fund for Academic Excellence (FFAE) Travel Award to attend the Society for Developmental Biology annual meeting in San Francisco, California (July 2005).

Howard University Faculty Merit Award, Howard University (July 2004).

Howard University FFAE Travel Award to attend the Society for Industrial Microbiology and Biotechnology (SIMB) annual meeting in Minneapolis, Minnesota (August 2003).

NIH Postdoctoral Fellowship Award (Individual NRSA). "The Agonist Site of Ionotropic Glutamate Receptor GluR6." Award No. 1F32NS010088-01 (May 1995-August 1996).

Robert S. and Louise P. Allen Award (given annually to the most outstanding biochemistry PhD student at Louisiana State University—November 1994).

Travel Award from LSU Graduate School to attend the American Society for Biochemistry and Molecular Biology (ASBMB) annual meeting in Washington, DC (March 1994).

The M. Agatha Ryan Award; The Louise Israel Award; The Xavier University (XU) Service Award for Seniors; The XU Gold Medal Award (all 4 years); Member: Alpha Kappa Mu National Honor Society, Alpha Epsilon Honor Society, and Alpha Epsilon Delta Premedical Honor Society; the XU Honorary Mathematics Club (May 1981).

The American Chemical Society (ACS) Certificate of Scholarship in Chemistry (May 1981).

The American Chemical Society (ACS) Undergraduate Analytical Award; the Marathon Oil Company Award; German Award (May 1980).

Full tuition scholarship to Xavier University (all 4 years—1977-1981).

Publications

72. Byrnes, W. M. (2020). E. E. Just's Broad, Yet Hidden, Influence on Modern Cell and Developmental Biology. *Molecular Reproduction and Development*, 87, 380-391. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/mrd.23270>

71. Byrnes, W. M. (2016). Diversity is Critical for Scientific Progress. *ASBMB Today*, 15 (February issue), 27-28. American Society for Biochemistry and Molecular Biology (ASBMB).

70. Byrnes, W. M. (2016). Essay Review: Racial Thought and Racist Thinking: Historical and Contemporary Perspectives. *The Journal of African American History* (1-2 (Winter-Spring)), 150-163.

69. Byrnes, W. M. (2015). *A Xavier Chemistry Alumnus Looks Back*. Published originally on the Xavier University Chemistry Department website. Now available at: https://www.researchgate.net/publication/275021540_A_Xavier_Chemistry_Alumnus_Looks_Back

68. Byrnes, W. M. (2015). E. E. Just and Creativity in Science. The Importance of Diversity. *The Journal of African American Studies*, 19(3), 264-278.

67. Byrnes, W. M. (2015). El Precursor Olvidado de la Epigenetica. *Investigacion y Ciencia*, 465, 46-49.

66. Byrnes, W. M. (2015). The Forgotten Father of Epigenetics. *American Scientist* (March-April), 106-109. <https://www.americanscientist.org/article/the-forgotten-father-of-epigenetics>

65. Ashenafi, M., Reddy, P. T., Parsons, J. F., Byrnes, W. M. (2015). The Fused Anthranilate Synthase from *Streptomyces venezuelae* Functions as a Monomer. *Molecular and Cellular Biochemistry*, 400, 9-15. <https://link.springer.com/article/10.1007/s11010-014-2256-3>
64. Byrnes, W. M. (2015). Dr. Ernest Just's Legacy. *Booklet: Ernest Everett Just, PhD: Outstanding African American Biologist of the 20th Century* (p. 13). Charleston: Medical University of South Carolina.
63. Byrnes, W. M. (2014). Climate Justice, Hurricane Katrina, and African American Environmentalism. *Journal of African American Studies*, 18(3), 305-314.
62. Bethea, G. S, Burton, K. R., [Byrnes W. M.] (2014). Highlighting the Legacy of E. E. Just: An Interview with Dr. W. Malcolm Byrnes. *Howard University Graduate School Research Magazine (April issue)*. Washington, DC. Available at: https://www.researchgate.net/publication/261473949_Interview_Highlighting_the_Legacy_of_Ernest_Everett_Just
61. Byrnes, W. M., Newman, S. A. (2014). Ernest Everett Just: Egg and Embryo as Excitable Systems. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution*, 322(4), 191-201. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4277254/pdf/nihms-650087.pdf>
60. Ashenafi, M., Ammosova, T., Nekhai, S., Byrnes, W. M. (2014). Purification and Characterization of Aminoglycoside Phosphotransferase APH(6)-Id, a Streptomycin-Inactivating Enzyme. *Molecular and Cellular Biochemistry*, 387(0), 207-216. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3942886/pdf/nihms-553233.pdf>
59. Byrnes, W. M. (2013). The Genius of Ernest Everett Just, *Howard University Graduate School Research Magazine (December issue)*. Washington, DC: Howard University Graduate School. Now available at: https://www.researchgate.net/publication/259196977_The_Genius_of_Ernest_Everett_Just
58. Byrnes, W. M. (2013). *Opinion: A Diverse Perspective: Progress in Science is Dependent on the Diversity of Its Workforce*. *The Scientist (July 29 issue, online)*. Available at: <http://www.the-scientist.com/?articles.view/articleNo/36733/title/Opinion--A-Diverse-Perspective/>
57. Byrnes, W. M. (2013). *Sulle orme di E. E. Just all Stazione Zoologica di Napoli: celebrazione di un'amicizia* (online). Translated into Italian by Luigia Santella. Available at: https://www.researchgate.net/publication/258343560_Sulle_orme_di_EEJust_alla_Stazione_Zoologica_di_Napoli_celebrazione_di_un'amicizia
56. Byrnes, W. M. (2013). *Walking in the Footsteps of E. E. Just at the Stazione Zoologica in Naples: Celebration of a Friendship*. Originally published on the Howard University Newsroom website. Now available at: https://www.researchgate.net/publication/258341600_Walking_in_the_Footsteps_of_Ernest_Everett_Just_at_the_Stazione_Zoologica_in_Naples_Celebration_of_a_Friendship
55. Byrnes, W. M. (2012) Climate Change, Hurricane Katrina, and African American Environmentalism. Published eleven years later, in 2023, on ResearchGate site. Available at: https://www.researchgate.net/publication/373388974_Climate_Change_Hurricane_Katrina_and_African_American_Environmentalism
54. Byrnes, W. M. (2012). *Review of African American Environmental Thought: Foundations by Kimberly K Smith*. *Environmental History*, 17(2), 442-443.

53. Debebe, Z., Nekhai, S., Ashenafi, M., Lovejoy, D. B., Kalinowski, D. S., Gordeuk, V. R., Byrnes, W. M., Richardson, D. R., Karla, P. K. (2012). Development of a sensitive HPLC method to measure in vitro permeability of E- and Z-isomeric forms of thiosemicarbazones in Caco-2 monolayers. *Journal of Chromatography B*, 906, 25-32.
52. Byrnes, W. M. (2012). *Anacostia, Environmental Justice, and a Pipeline Protest*. *Association of Environmental Studies and Sciences (AESS) Newsletter*, 4(1), 3-4.
51. Byrnes, W. M. (2010). *Life's Lineages (Review of New Foundations of Evolution by Jan Sapp)*, *American Scientist*, 98, 81-83. Available at: <https://www.americanscientist.org/article/lifes-lineages>
50. Byrnes, W. M. (2010). *Review of A Moral Climate: The Ethics of Global Warming by Michael S. Northcott*. *Journal for the Study of Religion, Nature and Culture*, 4(4), 499-501.
49. Byrnes, W. M. (2010). *A Biomedical Revolution: The Pro-Life Promise of a New Stem Cell Technology*. *America: A National Catholic Weekly*, 203(4) (August 16-23 issue), 16-18. Available at: http://americamagazine.org/sites/default/files/issues/cf/pdfs/745_1.pdf
48. Byrnes, W. M. (2010). *Ernest Everett Just: Experimental Biologist Par Excellence*. *ASBMB Today*, February issue, 22-25. Available at: <https://www.asbmb.org/asbmb-today/people/012510/ernest-everett-just>
47. Byrnes, W. M. (2009). *Review of Darwin's Gift to Science and Religion by Francisco Ayala*, *The National Catholic Bioethics Quarterly*, 9(4), 605-608.
46. Byrnes, W. M. (2009). *Review of The Panda's Black Box: Opening Up the Intelligent Design Controversy by Nathaniel Comfort (editor)*. *The National Catholic Bioethics Quarterly*, 8, 385-387.
45. Byrnes, W. M., Furton, E. J. (2009). Comments on "Moral Complicity in Induced Pluripotent Stem Cell Research". *Kennedy Institute of Bioethics Journal*, 19(2), 202-205. <https://philpapers.org/rec/WMACOM>
44. Byrnes, W. M. (2009). Confessions of a "Pro-Life" Obama Supporter. *The National Catholic Bioethics Quarterly*, 9(2), 241-244. Available at: https://www.pdcnet.org/ncbq/content/ncbq_2009_0009_0002_0241_0244?file_type=pdf
43. Byrnes, W. M. (2009). Ernest Everett Just, Johannes Holtfreter, and the Origin of Certain Concepts in Embryo Morphogenesis. *Molecular Reproduction and Development*, 76(10), 912-921. Available at: <https://onlinelibrary.wiley.com/doi/pdf/10.1002/mrd.21081>
42. Byrnes, W. M. (2009). *Review of Only a Theory: Evolution and the Battle for America's Soul by Kenneth R. Miller*. *Theology and Science*, 7, 427-429. Available at: <https://www.tandfonline.com/doi/abs/10.1080/14746700903239619>
41. Byrnes, W. M. (2009). *Introduction to the Special Issue: In Honor of E. E. Just*. *Molecular Reproduction and Development*, 76, 1. Available at: <https://onlinelibrary.wiley.com/doi/10.1002/mrd.21098>
40. Byrnes, W. M. (2008). Direct Reprogramming and Ethics in Stem Cell Research. *The National Catholic Bioethics Quarterly*, 8, 277-290. Available at: https://www.pdcnet.org/ncbq/content/ncbq_2008_0008_0002_0277_0290

39. Ashenafi, M., Carrington, R., Collins, A., Byrnes, W. M. (2008). The Fused TrpEG from *Streptomyces venezuelae* is an Anthranilate Synthase, not a 2-Amino-2-deoxyisochorismate (ADIC) Synthase. *Ethnicity and Disease*, 18((2 Suppl 2)), S2-9-13. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3371231/pdf/nihms380593.pdf>
38. Byrnes, W. M. (2007). *Just, Ernest Everett (1883-1941)*. *The New Dictionary of Scientific Biography*, 4, 66-70. Farmington Hills, MI: Charles Scribner's Sons/Gale Norton.
37. Byrnes, W. M. (2007). *Review of Challenging Nature: The Clash of Science and Spirituality at the New Frontiers of Life by Lee M. Silver*. *Worldviews: Environment, Culture, Religion*, 11, 248-253.
36. Byrnes, W. M. (2007). ANT-OAR Misrepresents the Scientific Facts (colloquy letter). *The National Catholic Bioethics Quarterly*, 7(2), 226-227.
35. Collins, A. C., Ashenafi, M., Saunders, A. A., Byrnes, W. M. (2007). Cloning and Expression of Streptomycin-Inactivating Enzymes APH(6)-Ia and -Id. *Cellular and Molecular Biology*, 53, 74-79.
34. Braun, G., Hellwig, M., Byrnes, W. M. (2007). Global Climate Change and Catholic Responsibility: Facts and Faith Response. *The Journal of Catholic Social Thought*, 4(2), 373-401. Available at: <https://philpapers.org/versions/BRAGCC>
33. Byrnes, W. M. (2007). Partial Trajectory: The Story of the Altered Nuclear Transfer-Oocyte Assisted Reprogramming (ANT-OAR) Proposal. *The Linacre Quarterly*, 74(1), 50-59. Available at: <https://epublications.marquette.edu/lnq/vol74/iss1/6/>
32. Byrnes, W. M. (2007). The Flawed Scientific Basis of the Altered Nuclear Transfer-Oocyte Assisted Reprogramming (ANT-OAR) Proposal. *Stem Cell Reviews and Reports*, 53, 74-79.
31. Byrnes, W. M. (2007). *Remembering Cicadas (a poem)*. *The Ecozoic Reader*, 4(4), 84. Available at: [https://www.researchgate.net/publication/258341142 Remembering Cicadas](https://www.researchgate.net/publication/258341142_Remembering_Cicadas)
30. Leyser, M. L., Finley, M. L., Lee, W., Munasinghe, M., Byrnes, W. M., Bender, F. (2007). *The EcoRes Call for Action: Achieving Global Climate Justice in the 21st Century*. Available at: <https://pdfslide.net/documents/achieving-global-climate-justice-in-the-21st-century.html?page=40>
29. Byrnes, W. M. (2006). *Review of Deeper than Darwin: The Prospect for Religion in the Age of Evolution by John F. Haught*. *The National Catholic Bioethics Quarterly*, 6, 179-182.
28. Byrnes, W. M., Eckberg, W. (2006). Ernest Everett Just (1883-1941): An Early Ecological Developmental Biologist. *Developmental Biology*, 296, 1-11.
27. Byrnes, W. M. (2006). Inconsistencies in the Pro-ANT-OAR Position (colloquy letter). *The National Catholic Bioethics Quarterly*, 6(2), 201-202.
26. Byrnes, W. M., Granados, J. (2006). *ANT-OAR Fails on All Counts: Method of Harvesting Stem Cells Riddled with Scientific and Ethical Flaws*. *Science and Theology News*, 1(June 2006), 23-25.
25. Byrnes, W. M. (2005). *Review of Beyond Therapy: Biotechnology and the Pursuit of Happiness by the U.S. President's Council on Bioethics*. *The National Catholic Bioethics Quarterly*, 5, 205-207.

24. Byrnes, W. M. (2005). Holistic Systems and "Delayed Hominization" are Incompatible (colloquy letter). *The National Catholic Bioethics Quarterly*, 5(3), 447-448.
23. Byrnes, W. M. (2005). Why Human "Altered Nuclear Transfer" is Unethical: A Holistic Systems View. *The National Catholic Bioethics Quarterly*, 5(2), 271-279.
22. Ashenafi, M., Saunders, A. A., Sundin, G. W., Byrnes, W. M. (2005). *Nucleotide Sequence of the Gene aph(6)Id from Pseudomonas syringae pv. syringae*. Accession No. AY997127 (genbank submission). National Center for Biotechnology Information (NCBI). Available at: <https://www.ncbi.nlm.nih.gov/nuccore/AY997127>
21. Collins, A. C., Byrnes, W. M. (2005). *Nucleotide Sequence of the Gene aph(6)Ia from Streptomyces griseus*. Accession No AY971801 (genbank submission). National Center for Biotechnology Information (NCBI). Available at: <https://www.ncbi.nlm.nih.gov/nuccore/AY971801>
20. Byrnes, W. M. (2004). *Review of A Devil's Chaplain by Richard Dawkins*. *The National Catholic Bioethics Quarterly*, 4(1), 216-218.
19. Byrnes, W. M. (2004). *Review of Enough: Staying Human in an Engineered Age by Bill McKibben*. *The National Catholic Bioethics Quarterly*, 4(3), 639-641.
18. Byrnes, W. M., Vilker, V. (2004). Extrinsic Factors Potassium Chloride and Glycerol Induce Thermostability in Recombinant Anthranilate Synthase from *Archaeoglobus fulgidus*. *Extremophiles*, 8, 455-462.
17. Ho, D. L., Byrnes, W.M., Ma, W.-P., Shi, M. Y., Callaway, D. E., Bu, Z. (2004). Structure-Specific DNA-Induced Conformational Changes in Taq Polymerase Revealed by Small Angle Neutron Scattering. *Journal of Biological Chemistry*, 279, 39146-39154.
16. Byrnes, W. M. (2004). The Ecological Imperative and Its Application to Ethical Issues in Human Genetic Technology. *Ethics in Science and Environmental Politics*, 2003, 63-65. Available at: <http://www.int-res.com/articles/esep/2003/E36.pdf>
15. Byrnes, W. M. (2004). *Bioethics for the Present and the Future (letter to the editor)*. *Chronicle of Higher Education*, 50, B18. Available at: <https://www.chronicle.com/article/bioethics-for-the-present-and-the-future/>
14. Byrnes, W. M. (2004). *Mail Call: A Research Phobia? (letter to the editor)*. *Newsweek International*, 143, 5). Available at: <https://www.newsweek.com/mail-call-research-phobia-127653>
13. Byrnes, W. M. (2003). *Review of Redesigning Humans: Our Inevitable Genetic Future by Gregory Stock*. *The National Catholic Bioethics Quarterly*, 3(2), 427-429. Available at: <https://philpapers.org/archive/BYRSGR.pdf>
12. Byrnes, W. M. (2003). Epigenetics, Evolution, and Us. *The National Catholic Bioethics Quarterly*, 3(3), 489-500.
11. Byrnes, W. M. (2003). Holism, Determinism, and the Developing Embryo (colloquy letter). *The National Catholic Bioethics Quarterly*, 3(4), 664-665.
10. Byrnes, W. M. (2002). *Review of Can a Darwinian Be a Christian? by Michael Ruse*. *The National Catholic Bioethics Quarterly*, 2(3), 564-566.

9. Byrnes, W. M. (2002). Human Genetic Technology, Eugenics, and Social Justice (abridged version). *Issues in Law and Medicine*, 18(1), 88-102. Available at: <https://law-journals-books.vlex.com/vid/malcolm-byrnes-genetic-technology-eugenics-53010671>
8. Byrnes, W. M. (2001). Human Genetic Technology, Eugenics, and Social Justice. *The National Catholic Bioethics Quarterly*, 1(4), 555-581.
7. Byrnes, W. M., Goldberg, R. N., Holden, M. J., Mayhew, M. P., Tewari, Y. B. (2000). Thermodynamics of Reactions Catalyzed by Anthranilate Synthase. *Biophysical Chemistry*, 84, 45-64.
6. Byrnes, W. M., Hu, W., Younathan, E. S., Chang, S. H. (1995). A Chimeric Bacterial Phosphofructokinase Exhibits Cooperativity in the Absence of Heterotropic Regulation. *Journal of Biological Chemistry*, 270, 3828-3835.
5. Zhu, X., Byrnes, W. M., Nelson, J. W., Chang, S. H. (1995). Role of Glycine-212 in the Allosteric Behavior of Phosphofructokinase from *Bacillus stearothermophilus*. *Biochemistry*, 34, 2560-2565.
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3. Byrnes, W. M., Zhu, X., Younathan, E. S., Chang, S. H. (1994). Kinetic Characteristics of Phosphofructokinase from *Bacillus stearothermophilus*: MgATP Nonallosterically Inhibits the Enzyme. *Biochemistry*, 33, 3424-3431.
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1. Li, J.-Y., Chen, Z., Lu, L., Byrnes, W. M., Chang, S. H. (1991). Sequence Diversity in the 5'-Untranslated Region of Rabbit Muscle Phosphofructokinase mRNA. *Biochemical and Biophysical Research Communications*, 170, 1056-1060.

Presentations

75. Byrnes, W. M., Fifteenth International Congress for Invertebrate Reproduction and Development (ICIRD), Kenoth G. Adiyodi Memorial Keynote Speaker, Title of Talk: "E. E. Just, Champion of the Cell Surface," American University, Washington, DC, United States (June 3, 2025).
74. Byrnes, W. M., Dean's Dynamic Duo Talk (one of a pair of talks from a clinician and a basic scientist, hosted by the dean of the College of Medicine at Howard University), Title of Talk: "E. E. Just and other Luminaries of Howard University College of Medicine," Howard University (held virtually), Washington, DC United States. (February 19, 2025).
73. Byrnes, W. M., 35th Karger Workshop in Evolutionary Neuroscience and the 43rd Annual Meeting of the J. B. Johnston Club in Evolutionary Neuroscience, Society for Neuroscience, Title of Talk: "The Genius of Ernest Everett Just," Stokes Health Sciences Library at Howard University, Washington, DC, United States. (November 10, 2023).
72. Byrnes, W. M., Departmental Seminar, Title of Talk: "Departmental Seminar: Key Features of the Metazoan Ground State," Department of Biochemistry and Molecular Biology, Howard

University, Washington, DC, United States. (April 20, 2023). Recording of talk is available on YouTube at: <https://www.youtube.com/watch?v=suH6co99WZY>

71. Byrnes, W. M., This was an interview I gave to 2 students at the Delaware Newark Charter High School. They were taking a Marine Science class under teacher Tami Lunsford, who won the prestigious Milken Educator Award in 2017. They were completing a class project on Just., "The Life and Work of Ernest Everett Just," Delaware Newark Charter High School (NCHS), Virtually, Newark, DE, United States. (February 3, 2023).
70. Byrnes, W. M., Bioengineering Colloquium at Princeton University, Title of Talk: "The Genius of Ernest Everett Just," Princeton University, Department of Chemical and Biological Engineering, Princeton, NJ, United States. (September 11, 2020). A recording is available on YouTube at: https://www.youtube.com/watch?v=sYsIT6_bn8s&t=2789s
69. Byrnes, W. M., Speaking of Race Podcast, Interviewed for the Podcast Segment "African American Scientists". (February 28, 2018). Available at: <http://speakingofrace.ua.edu/podcast/african-american-scientists>
68. Byrnes, W. M., E. E. Just Lecturer, Title of Talk: "E. E. Just's Broad (and Hidden) Influence on the Development of Modern Biology," Biological Sciences Division, University of Chicago, Chicago, IL, United States (November 17, 2016).
67. Byrnes, W. M., Keynote Speaker at the Juneteenth Celebration and Biennial Bullard Award Ceremony at the Marine Biological Laboratory in Woods Hole, MA, Title of Talk: "E. E. Just's Broad (and Hidden) Influence on the Development of Modern Biology." Woods Hole, MA, United States (June 17, 2016).
66. Byrnes, W. M., Departmental Seminar, Title of Talk: "E. E. Just's Broad (and Hidden) Influence on the Development of Modern Biology." Department of Anatomy, Howard University College of Medicine, Washington, DC, United States (April 4, 2016).
65. Byrnes, W. M., The Ernest E. Just Scientific Symposium at the Medical University of South Carolina (MUSC), Title of Talk: "E. E. Just's Broad Influence on the Development of Modern Biology," Charleston, SC, United States (February 26, 2016).
64. Byrnes, W. M., Panelist for Twitter Chat sponsored by the National Science and Technology News Service (NSTNS), Title: "E. E. Just: Forgotten Father of Epigenetics," Online (February 26, 2015).
63. Byrnes, W. M., The 2014 Minority Health and Health Disparities Grantees' Conference, Poster Presentation: "The Influence of E. E. Just on the Development of Modern Biology." National Harbor, MD (December 3, 2014).
62. Byrnes, W. M., Teaching Assistant (TA) Workshop, Howard University Graduate School. Title of Talk: "Motivating the STEM student: Lessons from the Life of E. E. Just," Howard University, Washington, DC, United States (August 20, 2014).
61. Fang, Y. (presenter), Byrnes, W. M., Southerland, W. M., Howard University Research Day 2014, Title of Talk: "Protein Structure Prediction of the TrpE Site of Anthranilate Synthase," Howard University, Washington, DC (April 4, 2014).
60. Byrnes, W. M. (co-author), Fang, Y. (presenter), Southerland, W., Advancing Computational Biology at Howard University, Poster Presentation: "Protein Structure Prediction of the TrpE Site of Anthranilate Synthase," Blackburn Center, Howard University, Washington, DC, United States. (March 26, 2014).

59. Byrnes, W. M., Bethea, G. S., Interview: "Highlighting the Legacy of E. E. Just: An Interview with Dr. W. Malcolm Byrnes." This was an interview I gave to Dr. Gwendolyn S. Bethea of the Howard University Graduate School. The topic was my research on Ernest Everett Just. Kyle R. Burton, a Howard pre-medical student at the time, transcribed the interview for publication in the H. U. Graduate School Research Magazine (April 2014 issue; see Publications list). (November 19, 2013).
58. Byrnes, W. M., Symposium: The Dynamically Active Egg: The Legacy of Ernest Everett Just (Luigia Santella and Jong T. Chun, organizers), Title of Talk: "Ernest Everett Just: Champion of the Cell Surface," The Naples Zoological Station, Naples, Italy. (May 13, 2013).
57. Byrnes, W. M. (presenter and senior author), Ashenafi, M. (co-author), Symposium: Translating Science to Better Health: The 13th RCMI International Symposium on Health Disparities, Poster Presentation: "Allosteric Regulation of a Fused Bacterial Anthranilate Synthase," Research Centers in Minority Institutions (RCMI), National Institutes of Health (NIH), Puerto Rico Convention Center, San Juan, Puerto Rico, United States. (December 10, 2012).
56. Byrnes, W. M., Regional Conference: Chemistry on the Chesapeake: The 43rd Middle Atlantic Regional Meeting of the American Chemical Society, Title of Talk: "Metabolic Engineering for Biofuel Production: Enzymes, Genes and Pathways," The Maryland Section of the American Chemical Society (ACS), University of Maryland-Baltimore County, Baltimore, MD, United States. (June 1, 2012).
55. Byrnes, W. M. (senior author and presenter), Ashenafi, M. (co-author), Regional Conference: Chemistry on the Chesapeake: The 43rd Middle Atlantic Regional Meeting of the American Chemical Society, Poster Presentation: "Role of Tryptophan-168 in the Allosteric Regulation of Anthranilate Synthase from *Streptomyces venezuelae*," Maryland Section of the American Chemical Society (ACS), University of Maryland-Baltimore County, Baltimore, MD, United States. (May 31, 2012).
54. Byrnes, W. M., Symposium: First Annual Science, Technology, Engineering and Mathematics (STEM) Symposium, Keynote Address: "Why is Science So Important? E. E. Just as a Role Model in STEM," The Ernest Everett Just Foundation, Inc., Just Middle School, Mitchellville, MD, United States. (July 25, 2011).
53. Hu, J. Z. (presenter), Ashenafi, M., Byrnes, W. M., Southerland, W. (advisor), Annual Departmental Graduate Research Day, Title of Talk: "Protein Structure Prediction in Drug Discovery: Homology Modeling of Anthranilate Synthase from *Streptomyces venezuelae*," Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC, United States. (May 12, 2011).
52. Ashenafi, M. (presenter), Byrnes, W. M. (co-author and advisor), Annual Departmental Graduate Research Day, Title of Talk: "A Site-Directed Mutagenesis Study of the Fused Anthranilate Synthase from *Streptomyces venezuelae*," Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC, United States. (May 11, 2011).
51. Mao, J. (presenter), Byrnes, W. M., Annual Departmental Graduate Research Day, Title of Talk: "Cloning, Genetic Engineering and Expression of Fused Aminodeoxychorismate Synthases (PabABs) from *Streptomyces griseus* and *Escherichia coli*," Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC, United States. (May 11, 2011).

50. Ashenafi, M. (presenter), Byrnes, W. M., Howard University Health Sciences Research Day, Title of Talk: "A Site-Directed Mutagenesis Study of the Fused Anthranilate Synthase from *Streptomyces venezuelae*," Division of Health Sciences, Howard University, Washington, United States. (April 15, 2011).
49. Debebe, Z. K. (presenter), Karla, P., Ashenafi, M., Byrnes, W. M., Ammasova, T., Kalinowski, D. S., Lovejoy, D. B., Jerebtsova, M., Gordeuk, V., Richardson, D., Nekhai, S. (senior author), Howard University Health Sciences Research Day, Title of Talk: "Inhibition of HIV-1 Transcription Using Iron Chelators and Estimation of Chelators' GI Absorption using Caco-2 Monolayers by an HPLC Method," Health Sciences Division, Howard University, Washington, DC, United States. (April 15, 2011).
48. Debebe, Z. (presenter), Ammasova, T., Ashenafi, M., Byrnes, W. M., Niu, X., Rotimi, J., Breuer, D., Obukhov, D., Richardson, D., Gordeuk, V., S., Karla, P. (advisor), Howard University Graduate School Research Symposium, Title of Talk: "HPLC Validation and in vitro PK Analysis of HIV Iron Chelator Permeability Evaluating Oral GI Absorption," Graduate School, Howard University, Washington, United States. (April 4, 2011).
47. Ashenafi, M. (presenter), Byrnes, W. M. (advisor), 12th RCMI International Symposium on Health Disparities, Poster Presentation: "A Site-Directed Mutagenesis Study of the Fused Anthranilate Synthase from *Streptomyces venezuelae*," The NIH Research Centers in Minority Institutions (RCMI), Nashville, TN, United States. (December 6, 2010).
46. Mao, J. (presenter), Byrnes, W. M. (advisor), 12th Research Centers in Minority Institutions (RCMI) International Symposium on Health Disparities, Poster Presentation: "Cloning and Genetic Engineering of Fused Aminodeoxychorismate Synthases (PabABs) from *Streptomyces griseus* and *Escherichia coli*," Nashville, TN, United States. (December 6, 2010).
45. Hu, J. Z. (presenter), Ashenafi, M., Byrnes, W. M., Southerland, W. (advisor), 12th Research Centers in Minority Institutions (RCMI) International Symposium on Health Disparities, Poster Presentation: "Structural Model of Anthranilate Synthase from *Streptomyces venezuelae*," Nashville, TN, United States. (December 6, 2010).
44. Debebe, Z. K. (presenter), Karla, P. (advisor), Ashenafi, M., Byrnes, W. M., Ammosova, T., Kalinowski, D. S., Lovejoy, D. B., Jerebetsova, M., Gordeuk, V., Richardson, D. R., Nekhai, S. (senior author), American Association of Pharmaceutical Scientists (AAPS) PSWC 2010 Meeting, Poster Presentation: "Validation of an HPLC Method to Measure the Iron Chelators Bp4eT and Bp4aT in Culture Media and Its Application to Study of Drug Transport Using Caco-2 Monolayers," New Orleans, LA, United States. (November 14, 2010).
43. Hu, J. Z. (presenter), Ashenafi, M., Byrnes, W. M., Southerland, W. (advisor and senior author), American Chemical Society (ACS) Fall National Meeting, Poster Presentation: "Computational Modeling Study of Anthranilate Synthase from *Streptomyces venezuelae* for the Development of New Antimicrobial Agents," Boston, MA, United States. (August 22, 2010).
42. Byrnes, W. M., America: The Jesuit Review Podcast, interviewed for segment titled "Toward a Pro-life Stem Cell Research" (August 10, 2010). Available at: <https://www.americamagazine.org/media/podcasts/toward-prolife-stem-cell-research>
41. Hu, J. Z. (presenter), Ashenafi, M., Byrnes, W. M., Southerland, W. (advisor), Howard University College of Medicine Research Day 2010, Title of Talk: "Structural Model of Anthranilate Synthase from *Streptomyces venezuelae*," Howard University College of Medicine, Howard University, Washington, DC, United States. (April 30, 2010).

40. Byrnes, W. M., Experimental Biology 2010: The Federation of American Societies for Experimental Biology (FASEB) Annual Meeting, Poster Presentation: "E. E. Just, Johannes Holtfreter, and the Origin of Certain Concepts in Embryo Morphogenesis," Anaheim, CA, United States. (April 24, 2010).
39. Ashenafi, M. (presenter), Ammosova, T., Nekhai, S., Byrnes, W. M. (advisor), Annual Meeting of the Society for Industrial Microbiology (SIM), Poster Presentation: "Purification and Initial Characterization of Streptomycin-Inactivating Enzyme APH(6)-Id," Toronto, Canada. (July 26, 2009).
38. Byrnes, W. M., The 20th Annual Graduate Research Emphasis Day, Title of Talk: "Research Projects in the Byrnes Laboratory: Characterization, Engineering and Structure-Function Analysis of Prokaryotic Enzymes," Howard University Department of Biochemistry and Molecular Biology, College of Medicine, Washington, DC, United States. (May 6, 2009).
37. Ashenafi, M. (presenter), Ammosova, T., Nekhai, S., Byrnes, W. M. (advisor), Research Symposium and Honors Day, Title of Talk: "Purification and Initial Characterization of Streptomycin-Inactivating Enzyme APH(6)-Id," Howard University, Washington, DC, United States. (April 9, 2009).
36. Byrnes, W. M., From Cells to Developmental Systems and Beyond: A Symposium Honoring Ernest Everett Just, Title of Talk: "Ernest E. Just: His Scientific Contributions and Their Importance Today," Howard University, Howard University, Washington, DC, United States. (November 21, 2008). I co-organized this NSF-funded symposium with Stuart Newman of New York Medical College in Valhalla, NY.
35. Okunbor, O. (presenter), Byrnes, W. M., The Leadership Alliance National Symposium-2008: The Promise of Leadership, Celebrating the First 100 PhDs, Title of Talk: "A Hypothetical TRAP-Like Protein from *Archaeoglobus fulgidus*," The Leadership Alliance, Hartford, CT, United States. (July 25, 2008).
34. Ashenafi, M. (presenter), Byrnes, W. M., Departmental Seminar Series, Title of Talk: "Characterization of the Fused, Monomeric Anthranilate Synthase from *Streptomyces venezuelae*," Department of Microbiology, Howard University College of Medicine, Washington, DC (October 16, 2007).
33. Ashenafi, M. (presenter), Byrnes, W. M., Departmental Seminar Series, Title of Talk: "The Fused Anthranilate Synthase from *Streptomyces venezuelae*," Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC, United States (April 19, 2007).
32. Byrnes, W. M., From Anthropocentrism to Ecocentrism: Making the Shift, Title of Contribution: "Email Posts on Various Topics," EcoRes Forum: Exploring the Ethical, Political and Socio-Cultural Aspects of Climate Change, online. (April 14, 2007).
31. Ashenafi, M. (presenter), Carrington, R., Collins, A., Byrnes, W. M. (advisor), The Sixth Annual New England Science Symposium, Title of Talk: "The Fused Anthranilate Synthase from *Streptomyces venezuelae*," New England Science Symposium, Boston, MA, United States. (March 2, 2007).
30. Ashenafi, M., Carrington, R., Collins, A., Byrnes, W. (presenter and advisor), Tenth International Research Centers in Minority Institutions (RCMI) Symposium on Health Disparities, Poster Presentation: "Characterization of the Fused Anthranilate Synthase from *Streptomyces venezuelae*," San Juan, Puerto Rico, United States. (December 13, 2006).

29. Ashenafi, M. (presenter), Carrington, R., Collins, A., Byrnes, W. M. (advisor), Annual Meeting of the Society for Industrial Microbiology (SIM), Poster Presentation: "The Fused TrpEG from *Streptomyces venezuelae* is an Anthranilate Synthase, not a 2-amino 2-deoxyisochorismate (ADIC) Synthase," Society for Industrial Microbiology, Baltimore, MD, United States. (July 30, 2006).
28. Byrnes, W. M., Departmental Seminar Series, Title of Talk: "Ernest Everett Just: Contributions to Developmental Biology," Howard University Department of Anatomy, College of Medicine, Washington, DC, United States. (February 14, 2006).
27. Byrnes, W. M., Departmental Seminar Series, Title of Talk: "Ernest Everett Just, An Early Ecological Developmental Biologist," Department of Biology, Howard University, Washington, DC, United States. (November 16, 2005).
26. Byrnes, W. M. (co-presenter), Braun, G. (co-presenter), Catholic Social Teaching and Ecology, Title of Talk: "Global Climate Change and Catholic Responsibility: Facts and Faith Response," Villanova University, Villanova, PA, United States. (November 9, 2005).
25. Byrnes, W. N. (presenter), Eckberg, W. R., 64th Annual Meeting of the Society for Developmental Biology, Poster Presentation: "Ernest Everett Just (1883-1941): An Early Ecological Developmental Biologist," San Francisco, CA, United States. (July 27, 2005).
24. Ho, D. L., Byrnes, W. M., Ma, W.-P., Shi, Y., Callaway, D. J. E., Bu, Z. (presenter), The Annual Meeting of the American Crystallographic Association (ACA), Poster Presentation: "Substrate-Specific DNA-Induced Conformational Changes in Taq Polymerase Revealed by Small Angle Scattering," Orlando, FL (May 28, 2005).
23. Byrnes, W. M., Global Climate Change: Facts and Faith Response, "Climate Change, Ecosystem Disruption and Species Extinction," St. Rose of Lima Catholic Church, Gaithersburg, MD, United States. (May 10, 2005).
22. Collins, A. (presenter), Byrnes, W. M., Graduate Student Research Symposium, Poster Presentation: "Cloning and Expression of the Aminoglycoside-Modifying Enzyme APH(6)-Ia from *Streptomyces griseus*," Society for Experimental Biology and Medicine (SEBM)—DC Chapter, Georgetown University, Washington, DC, United States. (April 18, 2005).
21. Collins, A. C. (presenter), Byrnes, W. M., Annual Howard University Graduate Research Symposium and Honors Day, Title of Talk: "Cloning and Expression of the Aminoglycoside-Modifying Enzyme APH(6)-Ia from *Streptomyces griseus*," Howard University Graduate School, Howard University, Washington, DC, United States. (April 12, 2005).
20. Ashenafi, M. (presenter), Collins, A., Saunders, A., Byrnes, W. M. (advisor), Ninth International Research Centers in Minority Institutions (RCMI) Symposium on Health Disparities, Poster Presentation: "Cloning and Expression of Streptomycin-Inactivating Enzymes," Baltimore, MD, United States. (December 8, 2004).
19. Byrnes, W. M., Departmental Seminar Series, Title of Talk: "Antibiotic Biosynthesis and Resistance: (i) TrpEG, a Homolog of Phenazine Biosynthetic Enzyme PhzE, (ii) Aminoglycoside-Inactivating Enzymes APH(6)-1a and -Id," Howard University Department of Microbiology, Howard University College of Medicine, Washington, DC, United States. (November 18, 2004).
18. Byrnes, W. M. (presenter), Ho, D. L., Callaway, D. J. E., Jana, D., Shi, Y., Bu, Z., Extremophiles 2004: The 5th International Conference on Extremophiles, Poster Presentation: "A Substrate-Specific DNA Substrate Induces Conformational Changes in Taq

- Polymerase," International Society for Extremophiles, Hyatt Regency Hotel, Cambridge, MD, United States. (September 19, 2004).
17. Carrington, R., Byrnes, W. M. (presenter and advisor), Annual Meeting of the Society for Industrial Microbiology (SIM), Poster Presentation: "Expression of TrpEG from *Streptomyces venezuelae*: Is the Enzyme a 2-Amino-2-deoxyisochorismate (ADIC) Synthase?" Society for Industrial Microbiology, Anaheim, CA, United States. (July 25, 2004).
 16. Collins, A. (presenter), Byrnes, W. M. (advisor), American Society for Microbiology (ASM) Student Day Meeting, Poster Presentation: "Purification of Plasmid DNA from the Gram-Positive Bacterium *Streptomyces lividans*," American Society for Microbiology (ASM), George Washington University, Washington, DC, United States. (April 22, 2004).
 15. Byrnes, W. M., Departmental Seminar Series, Title of Talk: "Antibiotic Biosynthesis and Resistance: (i) TrpEG, a Homolog of Phenazine Biosynthetic Enzyme PhzE, (ii) Aminoglycoside-Inactivating Enzymes APH(6)-1a and -Id," Department of Biochemistry and Molecular Biology, Howard University College of Medicine, Washington, DC, United States. (October 30, 2003).
 14. Carrington, R. (presenter), Byrnes, W. M. (advisor), The Leadership Alliance National Symposium--2003: Building a Community of Excellence, Title of Talk: "The Cloning and Expression of TrpEG from *Streptomyces venezuelae*," Chantilly, VA, United States. (July 25, 2003).
 13. Byrnes, W. M. (presenter), Vilker, V. L. (co-author), American Association for Biochemistry and Molecular Biology (ASBMB) Annual Meeting, Poster Presentation: "A Cooperative Anthranilate Synthase from the Marine Hyperthermophile *Archaeoglobus fulgidus*," Ernest N. Morial Convention Center, New Orleans, LA, United States. (April 19, 2002).
 12. Byrnes, W. M. (panelist), The Science and Ethics of Stem Cell Research, Title of Talk: "Scientific Aspects of Human Stem Cell Research," St. Rose of Lima Catholic Church, Gaithersburg, MD, United States. (January 22, 2002).
 7. Byrnes, W. M., Earlier Invited Talks: Prior to joining Howard's faculty in October 2001, a total of FIVE invited talks were given. These were at: LSU (graduate student symposium), Cornell University, University of Louisiana at Lafayette, McNeese State University in Lake Charles, LA, and Nicholls State University in Thibodaux, LA (August 1991-October 2001).
 1. Byrnes, W. M., Earlier Presentations: Prior to joining Howard's faculty in October 2001, a total of SEVEN presentations were given. These were at: the Southeast/Southwest Regional Meeting of the American Chemical Society (ACS) in December 1980 (with Les Shipman); the 1993 joint meeting of the MidSouth Biochemists and the South-Central Branch of the American Society of Microbiology; the 1994 and 1995 annual meetings of the American Society for Biochemistry and Molecular Biology (ASBMB); the Louisiana Academy of Sciences annual meeting in February 1998; the First Annual Biotechnology Division (NIST) Retreat on April 27, 2000, at the Center for Advanced Research in Biotechnology in Rockville, MD, and the annual meeting of the Society for Industrial Microbiology (SIM) in August 2000 (August 1991-October 2001).

Research Grants

NIH MBRS-SCORE Grant (SC3 mechanism); Grant PI, W. M. Byrnes; Title: "Characterization and Engineering of Fused Chorismate-Utilizing Enzymes;" Award Number SC3 GM083752-01. (June 2008 – May 2013); Total direct costs: \$300,000.

Two-year NIH Supplemental Grant. PI, W. M. Byrnes; Title: Administrative Supplement to Existing SC3 Grant (1 SC3 GM 083752 01); Award Number SC3 GM083752-02S1. (October 2009 – September 2011); Total direct costs: \$122,016

NSF Symposium Grant; PI, W. M. Byrnes and Co-PI, Stuart A. Newman of New York Medical College; Title: "From Cells to Developmental Systems and Beyond: A Symposium Honoring Ernest Everett Just;" Award Number IOS-0830114. (September 2008 – August 2009); Total direct costs: \$18,000

Five-year NIH RCMI Pilot Project grant; PI, W. M. Byrnes; Title: "Structural and Functional Characterization of Aminoglycoside-6-Phosphotransferases;" Overall RCMI grant PI Robert Taylor, MD, PhD; Award Number G 12 RR 003048. (June 2003 – May 2008); Total direct costs: \$362,463

Three-year NIH MBRS/SCORE Supplemental Project Grant; PI, W. M. Byrnes; Title: "Characterization of Phenazine Biosynthetic Enzyme PhzE and Its Homolog from *Streptomyces venezuelae*;" Overall MBRS/SCORE grant PI, George Littleton, PhD; Award Number S06 GM08016-34. (August 2003 – July 2006); Total direct costs: \$105,000

Two-year Howard University New Faculty Award; PI, W. M. Byrnes; Title: "Cloning, Expression and Characterization of Chorismate-Utilizing Enzymes from *Streptomyces* Involved in Biosynthesis of Bioactive Compounds." (November 2001 – June 2003); Total direct costs: \$50,000

Award from University to Renovate Research Laboratory in Room 4404 Adams Building. Spring 2002 - Spring 2003; Total cost: ~\$45,000

Student Research Supervision and Mentoring

Howard University: Postdoctoral Research Supervisor, Projects: Studies of the Anthranilate Synthase from *Streptomyces venezuelae* and of Various Aminoglycoside Phosphotransferases (2004 - 2012). Advisee: Meseret Ashenafi

Howard University: Major Advisor for doctoral student, Dissertation Title: "Cloning, Sequencing and Expression of the Gene for the Aminoglycoside-Modifying Enzyme APH(6)-Ia from *Streptomyces griseus*" (May 2007). Advisee: Alvin Collins

Howard University: Mentored EIGHT graduate students in directed research projects, THREE undergraduates in summer research projects, and ONE postdoctoral researcher (2002-2013).

At the University of Louisiana at Lafayette, directed the independent research projects of FOUR undergraduate students.

At Cornell University, supervised the senior honors thesis project of an undergraduate student.

At Louisiana State University, supervised the rotation projects of THREE first-year graduate students and the independent research project of ONE undergraduate student.

Graduate and Undergraduate-Level Courses Taught

At Howard University, taught the following medical, dental, pharmacy and graduate-level courses: First-Year Medical Course, Molecules and Cells Unit IA; General Biochemistry Lecture; General Biochemistry Laboratory; Directed Research in Biochemistry; Orientation to Research in Biochemistry; Research for PhD Candidates; Seminar in Biochemistry (Course Coordinator for three one-year stints); Advanced Enzymology (Course Director); Principles of

Metabolic Regulation (Course Director); Dental Biochemistry (Course Director, 2015-2022); and Biochemistry for Pharmacy Students (course director, 2011-2014)

At the University of Louisiana at Lafayette, taught courses in biochemistry (lecture and laboratory), chemistry for students in nursing and other health-related fields, and chemistry for education majors. Directed departmental seminar program (August 1997- May 1999).

At Louisiana State University, while a teaching assistant in the Department of Biochemistry, team- led the pre-medical and graduate-level Biochemistry Laboratory course (1989-1992).

At St. John's College in Belize City, Belize, taught a two-year junior college-level (A-Level) course in chemistry (1984-1986). Prepared the students for their Cambridge A-level examination. Also taught a two-year high school (O-level) chemistry course and prepared students for the corresponding Cambridge O-level exam.

At the University of Illinois in Champaign-Urbana, team-taught (as a teaching assistant) General Chemistry and Biochemistry Laboratory courses (1982-1984)

At Xavier University of Louisiana, taught Analytical (Quantitative Analysis) and Organic Chemistry Laboratory courses (1981-1982)

Teaching Innovation and Curriculum Development

Course Revision. First-Year Medical Course (Molecules and Cells, Unit 1A). July 2006 – September 2024.

July 2020-Present: I introduced several flipped classes as part of an effort to increase the active learning component of the course. These were in the areas of the SARS-CoV-2 virus (the viral spike protein was discussed), carbohydrates (provided/discussed background information in this area) and proteins (discussed diseases related to the misfolding of proteins). The flipped class on the viral spike protein is being discontinued now (July 2022), and the one on diseases related to the misfolding of proteins is taking its place.

July 2006-Present: I developed a series of PowerPoint-based lectures on the following topics: Review of Acids and Bases with a Medical Focus; Acid-Base Balance and Imbalance; Proteins (I-IV), the SARS-CoV-2 Spike Protein (flipped class); Protein Folding, Unfolding and Misfolding (flipped class); Hemoglobin; Bioenergetics and Introduction to Metabolism; Carbohydrates (flipped class); Glycolysis; Gluconeogenesis; the Pentose Phosphate Pathway; the TCA Cycle; Glycogen Metabolism; the Electron Transport Chain and Oxidative Phosphorylation; and Integration of Metabolism. Altogether, I give about 40% of the lectures in the course. In addition, I developed four team-based learning (TBL) exercises on the following topics: acid-base balance and imbalance, hemoglobin, diseases of carbohydrate metabolism, and the integration of metabolism with a case-based focus on type 2 diabetes.

Course Revision. Dental Biochemistry. August 2010 – December 2024.

I developed a series of PowerPoint-based lectures on the following topics: Review of Acids and Bases with a Medical-Dental Focus; Acid-Base Balance and Imbalance; Proteins (I-IV); Hemoglobin; Bioenergetics and Introduction to Metabolism; Enzymes (I-III); Carbohydrates (flipped class); Glycolysis; Gluconeogenesis; the Pentose Phosphate Pathway; the TCA Cycle; Glycogen Metabolism; the Electron Transport Chain and Oxidative Phosphorylation; Amino Acid Metabolism (I-II); and Integration of Metabolism. Traditionally, I have given about 60% of the total number of lectures in the course. In several of the lectures, I provide a dental-specific orientation, such as discussing (a) fluoride as an inhibitor of the glycolytic pathway enzyme enolase and of bacterial growth in general, and (b) the salivary mucins, which play critical roles in maintaining oral health and preventing tooth disease and decay.

Course Revision. Principles of Metabolic Regulation. January 2011 – May 2024.

Since becoming the coordinator of this graduate-level course, I have retained some existing aspects and made some changes. I retained the small-group, round-table discussion format, the focus on reading papers from the scientific literature, and the requirement that students write an abridged NIH-style research proposal on a topic related to metabolism. Some changes I've made have included 1) the recruitment of several junior faculty members to lend their expertise and lead discussions on relevant topics of interest, 2) the inclusion of two lectures on background material, and 3) the inclusion of topics in emerging areas such as (a) cellular metabolism and the epigenetic control of chromatin structure, (b) metabolism and cancer, (c) metabolism and stem cell pluripotency, and (d) metabolism, the microbiota and human health.

Course Revision. Advanced Enzymology. January 2011 – May 2025.

As with the Principles of Metabolic Regulation course (see above), this a graduate-level course mostly taken by PhD students. The two courses are taught alternately every other year in the spring. The course is taught in a small-group, round-table format, and there is a strong focus on reading and discussing papers from the scientific literature. Since becoming coordinator in 2011, I have made several changes. First, I began giving a series of introductory lectures in enzymology to make sure all students started the course on the same footing. Second, I instituted "Profile of an Enzyme" discussions, each centered around articles from the literature on a particular enzyme. One of these was the CRISPR-Cas9 enzyme system for modifying/editing DNA. Third and finally, I had students write a literature-based research paper on an enzyme of their choice. One of the major goals of the course is to help students become conversant with the scientific literature in enzymology, so that, if they saw a paper in a journal on an enzyme, they would feel comfortable reading it and trying to understand it.

Course Revision. Graduate Biochemistry Laboratory. 2014 – May 2025.

I created a new experiment in enzyme kinetics for the students. It involves carrying out steady-state kinetic assays on the enzyme alkaline phosphatase from *E. coli*, and then determining kinetic parameters such as the Michaelis constant, the turnover number, and the inhibition constant for inorganic phosphate. Students must write and turn in a lab report as part of the exercise.

Faculty Development Activities (a partial list; also see Presentations)

Symposium: "The Tapestry of Health: Genetic Diversity, History and Cultural Identity," an American Association for the Advancement of Science (AAAS) Dialogue on Science, Education and Religion (DoSER) Program, AAAS Headquarters, Washington, DC, December 18, 2018 (attendee).

Conference: "16th International Association of Biochemistry Educators (ABE) Conference," Clearwater Beach, FL, May 2017 (attendee)

Conference: Symposium at Catholic University: "An Ecologically Informed Theological Education," Washington, DC, March 2017 (attendee)

Conference, RCMI Symposium: "Advancing Computational Biology at Howard University," Washington, DC, April 2016 (attendee)

Seminar: American Association for the Advancement of Science (AAAS) Meeting: "New Directions for Inclusive STEM Education and Career Mentoring," Washington, DC, April 2016 (attendee)

Conference: AAAS Dialogue on Science, Ethics and Religion (DoSER) Conference: "Perceptions: Science and Religious Communities," Washington, DC, March 2015 (attendee)

Seminar: AAAS DoSER Workshop on the Religion-Science Dialogue, Washington, DC, February 2015 (attendee)

Conference: Experimental Biology 2011, Washington, DC, April 9-13, 2011 (attendee).

Symposium: National Cancer Institute (NCI) Symposium on Chromosome Biology, "Chromatin Dynamics in Development and Disease," Natcher Conference Center, National Institutes of Health (NIH), Bethesda, MD, April 8-9, 2010 (attendee).

Conferences: National Council for Science and the Environment (NCSE) Annual Meetings, Washington, DC (2008-2011) (attendee)

Conference: Annual Meeting of the American Society for Biochemistry and Molecular Biology (ASBMB), Washington, DC, April 28-May 2, 2007 (attendee)

Symposium: "New Directions in Health: The Global Burden of Chronic Disease," American Association for the Advancement of Science (AAAS) Philip Hague Abelson Advancing Science Seminar Series, Washington, DC, December 8, 2005 (invited attendee)

Conference: International Union of Microbiological Societies (IUMS) 2005 Meeting: "Microbes in a Changing World," San Francisco, CA, July 23-28, 2005 (attendee)

Symposium: "Technology and the Promise of Health," AAAS Advancing Science Seminar Series, Washington, DC, October 14, 2003 (attendee)

Symposium: "Recombinant Protein Expression and Purification," hosted by Amersham, Inc., *Johns Hopkins University Hospital*, Baltimore, MD, March 17, 2003 (attendee)

Symposium: "Proteomics Technology," hosted by ThermoFinnigan at the National Institutes of Health (NIH), Bethesda, MD, November 11, 2002 (attendee)

Conference: Annual SIM Meeting, Philadelphia, PA, August 11-15, 2002 (attendee)

Symposium: "Defining the Mandate of Proteomics in the Post-Genomic Era," National Academy of Sciences (NAS), Washington, DC, February 25, 2002 (invited participant)

Workshop: "How to Find and Win Grants," sponsored by H.U. Office of Research Administration, Howard University, November 27-28, 2001 (participant)

Workshop: "Extremophile Research: Theory and Techniques," Center of Marine Biotechnology (COMB), University of Maryland, Baltimore, MD, July 23-26, 2001 (participant)

Conference: Annual Meeting of the Society for Industrial Microbiology (SIM), San Diego, CA, July 23-27, 2000 (attendee).

University-Wide, College and Departmental Service

University-Wide

Member, Howard University's Teaching, Learning and Technology Committee (2014 - 2025).

Judge, Howard University Center for Excellence in Teaching and Learning Assessment (CETLA) Teaching with Technology Award competition. (January 1, 2016 - February 1, 2016).

Member, Howard University Program Prioritization Task Force (PPTF) Peer Evaluation Team. I was a member of a team of three faculty members that reviewed a subset of the university's graduate programs and submitted a report to the provost. The university was engaged in academic renewal at the time (2019).

Session Moderator, Howard University Research Day 2014, April 4, 2014.

Member, Judging Committee for "Emerging Scholar" Award, Howard University Faculty Awards, 2013

Member, Howard University Radiation Safety Committee (2009-2012)

Reviewer of Howard University Fund for Academic Excellence (FFAE) Awards, Cycles 9 through 13, 2002-2007

Evaluator, Howard University Graduate School's Annual Research Symposium and Honors Day, April 2, 2008, April 9, 2009, and April 4, 2011.

Chair, Judging Committee for "Inspirational Interdisciplinary Project" Award, Howard University Faculty Awards, 2007

Member, Judging Committee for "Scholarship and Creativity" Award, Howard University Faculty Awards, 2005

Member, Howard University's Fund for Academic Excellence (FFAE) Advisory Review Committee: Cycles 10-13 (2003-2008).

College of Medicine

Instructor, College of Medicine's Preliminary Academic Reinforcement Program (PARP) Course (2008 - 2025).

Member, Liaison Committee on Medical Education (LCME) Site Visit Team (Financial Aid/Admissions), Howard University College of Medicine. (April 7, 2017).

Member, Howard University College of Medicine's Financial Aid Committee (2005-2025).

Member, Howard University College of Medicine's Student Grievance Committee (2004-2006).

Departmental

Director/Chair, Departmental Graduate Studies Committee (for three separate one-year stints during the period from 2006 to 2022). Member of committee for nine years altogether.

Examiner for SIXTEEN PhD Students in Enzymology or Metabolism and Metabolic Regulation, Written Qualifying Examination Committee (2003 - 2022).

Examiner for FIVE PhD students, Oral Qualifying Examination Committee (2003 - 2022).

Member or Chair of PhD Advisory and PhD Examination Committees for EIGHT Students.
(January 1, 2002 - May 15, 2022).

Professional Service (beyond Howard University)

Peer-Reviewer for Journals: African Journal of Microbiology Research, Biomedical Chromatography, Biotechnology and Bioengineering, Extremophiles, Heredity, Marine Environmental Research, Molecular Biology Reports, and Molecular Reproduction and Development (2002 - 2025).

Scientific Advisor and Reviewer for children's picture book on E. E. Just titled "The Vast Wonder of the World: Biologist Ernest Everett Just," by Melina Mangal and Luisa Uribe, published in November 2018 by Lerner Publishing Group (Millbrook Press). Available at:
<https://lernerbooks.com/shop/show/16045?srsId=AfmBOoqoSj3ljrmcn6GyJ78iy8iRYZZDZY0vmFxxUXNa0Ktvub33KzaB>

Reviewer for Chapter 15 ("Signal Transduction and G-Protein Coupled Receptors") of Lodish et al.'s *Molecular Cell Biology*, 8th edition, 2012.

Session Chair, 43rd Middle Atlantic Regional Meeting of the American Chemical Society, Baltimore, MD. (May 31, 2012 - June 2, 2012).

Panelist (Reviewer), National Defense Science and Engineering Graduate (NDSEG) Fellowship Program, National Harbor, MD (February 18-20, 2011).

Reviewer of pre-doctoral grant applications to the NSF Graduate Research Fellowship Program (GRFP)—five years, in January of each year (2008-2012)

Co-organizer and leader of a religious retreat titled, "Eco-Spirituality: Out of the Birdbath and into the World." The focus was on the scriptural basis of living lightly on the earth and caring for creation., St. Camillus Catholic Church, Silver Spring, MD. (May 6, 2011 - May 8, 2011).

Guest Editor. Organized, with editor-in-chief Gary Wessel of Brown University, a special issue of the journal *Molecular Reproduction and Development* (October 2009) that featured peer-reviewed articles on research related to the work of E. E. Just. Many of the contributors to the special issue were speakers at the earlier (November 2008) symposium honoring Just on Howard's campus., *Molecular Reproduction and Development* (journal). (November 2008 - October 2009).

Organizer, with Stuart Newman of New York Medical College, of a two-day international symposium honoring African American embryologist E. E. Just on Howard's campus. Symposium was funded by the National Science Foundation. Title: From Cells to Developmental Systems and Beyond: A Symposium Honoring Ernest Everett Just., Howard University, Washington, DC. (November 20, 2008 - November 21, 2008).

Reviewer of *Textbook of Biochemistry with Clinical Correlations*, 7th edition, by Devlin (ed.), 2007.

Reviewer, University of Maryland's Maryland Industrial Partnerships (MIPS) Program, Fall 2006

Reviewer of the textbook *Biochemistry*—5th through 9th editions—by Berg, Tymoczko and Stryer (2003-2017)

Ad hoc Reviewer, NIH/NIGMS *Minority Biomedical Research Support (MBRS)* Review Panel (MPRC-B), October 12, 2005

Co-organizer—along with a solar engineer, a theologian and a climate change expert—and panel member for a forum on global environmental change titled: *Global Climate Change and Catholic Responsibility.*, St. Rose of Lima Catholic Church, Gaithersburg, MD. (May 10, 2005).

Judge for the *Society for Experimental Biology and Medicine (SEBM)*—DC Chapter Graduate Student Research Symposium held at Georgetown University, April 18, 2005

Reviewer of abstracts for the *Ninth International RCMI Symposium on Health Disparities* held in Baltimore, MD, December 8-11, 2004

Participant (Faculty Mentor) in the Leadership Alliance's Summer Research-Early Identification Program (SR-EIP), 2003-2008. Mentored three undergraduate students. Howard University is a member of the alliance.

Co-organizer and co-host of a symposium on stem cell research with Dr. Karen Stohr of Georgetown University's Department of Philosophy. Title of symposium: *The Science and Ethics of Stem Cell Research.*, St. Rose of Lima Catholic Church, Gaithersburg, MD. (January 22, 2002).

While at NIST, served as a peer reviewer of several journal article manuscripts and a number of applications to federal agencies (NSF, the NIST Advanced Technology Program (ATP)) or private foundations (the Israel-U.S. Binational Industrial Research and Development (BIRD) Foundation) for funding.

As a PhD student at LSU, co-organized the first student-run graduate research symposium (in biochemistry) at the university (1993); helped establish and run a journal club for PhD students in biochemistry; team-taught in the pre-medical and graduate biochemistry laboratory course; and supervised the rotations projects of three graduate students and the independent research project of one undergraduate student.

Professional Memberships

American Association for the Advancement of Science (AAAS) (1988 - Present).

Sigma Xi (1996 - Present).