

Donald Aduba
Dermatology
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Research interests

Skin Biology, Biomaterials, 3D Printing, Tissue Engineering, Materials Science, Polymer Chemistry, and Drug Delivery

Current Position(s)

Scientist II, Assistant Professor, Department of Dermatology
Uniformed Services University of the Health Sciences
Bethesda, MD

Education

Ph.D., Biomedical Engineering, Virginia Commonwealth University, Richmond, VA 2012-15
M.S., Biomedical Engineering, Virginia Commonwealth University, Richmond, VA 2009-12
B.S., Kinesiology, University of Virginia, Charlottesville, VA 2004-08

Past Academic Appointments

Postdoctoral Research Fellow 2015 - 2018
Department of Mechanical Engineering
Virginia Tech
Blacksburg, VA
Instructor 2015 - 2018
Department of Materials Science & Engineering
Virginia Tech
Blacksburg, VA

Professional Positions and Experience

Scientist I, Department of Dermatology 2021-2023
Henry Jackson Foundation
Uniformed Services University of the Health Sciences
Bethesda, MD
Postdoctoral Research Fellow 2019-2020
Division of Materials Science & Technology
U.S. Naval Research Laboratory
Washington, DC
Postdoctoral Research Fellow 2018-2019
Division of Chemistry
U.S. Naval Research Laboratory
Washington, DC

Certification and Licensure

Certificate, American Association for Laboratory Animal Science (AALAS) Personnel Conductive Survival surgical procedures in rodent models 2023
Certificate, CITI Program: Basic Course, OUSD P&R Human Research 2022
Certificate, AALAS IACUC Training 2021
Certificate, AALAS Personnel working with mice 2021
Certificate, American Chemical Society Short Course 2016

Professional Development

IACUC Protocol Development 2023
Bio-Rad Fundamentals of Real-Time PCR Course 2022
Rodent Handling & Aseptic Technique for Surgical Procedures 2021-Present
Rodent Surgery 2021-Present

Professional Memberships and Activities

Phi Beta Sigma Fraternity, Inc. 2008-present
American Chemical Society 2011-2018
Society for Biomaterials 2013-2016

Peer Review Service

Reviewer, Journal of Applied Polymer Science 2017-Present
Reviewer, PLOS One 2025-Present

Honors and Awards

National Research Council Postdoctoral Research Council Associateship Award 2018-2020
Innocentive: America Makes Smart Structure Challenge: Team Awardee 2016
Southern Regional Board Doctoral Scholar 2012-2015

Grants and Contract Awards

Title: Investigation of high-resolution 3D printed microporous bioceramics as bone tissue engineering scaffolds, R03 grant proposal, National Institutes of Health, Grant Cost: \$76,867, FY19

Title: Ex vivo planning of structural cardiac interventions using 3D printed heart models featuring functionally graded polymers, Institute for Critical Technology and Applied Science, Grant Cost: \$79,982, FY18

Oral Presentations

Invited Presentations

"Skin hamartomas in tuberous sclerosis complex: Impaired fibroblast differentiation resulting in sustained regenerative properties," National Institutes of Health – Dermatology Branch Seminar, Bethesda, MD, September, 26, 2024.

"3D Printing in the Biomedical Space: A journey through the intersection of engineering design and personalized medicine," Northeastern University, Cornerstone of Engineering Course, Virtual Guest Lecture, Boston, MA, April 8, 2024.

"A Simplified Culture Protocol that Preserves Hair Follicle Neogenesis in Grafted Dermal-Epidermal Composites," National Institutes of Health – Dermatology Branch Seminar, Bethesda, MD, July, 13, 2023.

"Developing a validated methodology for melanocyte enrichment to identify TSC mutations in patient melanocytes derived from hypomelanotic macules," National Institutes of Health – Dermatology Branch Seminar, Bethesda, MD, June 23, 2022.

National/International Meetings

"3D printed acid-cleavable polyethylene glycol methacrylate gels using vat photopolymerization," The 254th National Exposition of the American Chemical Society, Washington, DC, August 21, 2017.

"A topological investigation of shrinkage in sintered bioceramic parts," 28th Annual International Solid Freeform Fabrication Conference Proceedings, Austin, TX, August 9, 2017

Poster Presentations

National/International Meetings

D.C. Aduba, C. Wisdom, O. Lewis, S. Xavier, E.O.N. Phillips, V.B. Ho, G.J. Klarmann, & T.N. Darling. "Patterned Dermal Papilla Spheroids in Dermal Epidermal Composites for Improved Wound Healing," Military Health System Research Symposium, Kissimmee, FL, August 4-7, 2025.

D.C. Aduba, S. Verling, S. Xavier, E Phillips, P. Klover, N. Nathan, J. Wang, S. Li, R. Thangapazham, L.Sperling, J. Moss & T. Darling. "Tsc2 deletion in mesenchymal cells improves distal digit regeneration," Society for Investigative Dermatology Annual Meeting, San Diego, CA, May 6-10, 2025.

D.C. Aduba, C. Wisdom, S. Xavier, O. Lewis, E.O.N. Phillips, G.J. Klarmann, K.H. Gilchrist, V.B. Ho, I.M. Herman & T.N. Darling. "Treatment of Cellular Spheroids with Bioactive Peptides to Support Human Hair Follicle Neogenesis in Xenografts," Military Health System Research Symposium, Orlando, FL, August 26-29, 2024.

S. Xavier, D.C. Aduba, E.O.N. Phillips, J. Roy, S. Li, J. Wang, I.M. Herman & T.N. Darling. "Dermal Epidermal Composites Treated with Bioactive Peptides show improved Graft Durability and Epidermal Thickness," Military Health System Research Symposium, Orlando, FL, August 26-29, 2024.

E.O.N. Phillips, W.B. Rittase, S. Xavier, D.C. Aduba, J. Slaven, J. Roy, J. Wang, I.M. Herman, R.M. Day & T.N. Darling. "Bioactive Peptides mitigate Radiation Induced Dermatitis," Society for Investigative Dermatology Annual Meeting, Dallas, TX, May 15-18, 2024.

S. Xavier, J. Roy, S. Li, J. Wang, D.C. Aduba, I.M. Herman & T.N. Darling. "Improved graft survival and hair follicle neogenesis in dermal epidermal constructs incubated with bioactive peptides," Society for Investigative Dermatology Annual Meeting, Dallas, TX, May 15-18, 2024.

D.C. Aduba, J. Roy, S. Li, S. Xavier, J. Wang, J. Betz, V.B. Ho & T.N. Darling. "In vitro cultivation of dermal-epidermal composites in a single medium supports human hair follicle neogenesis in xenografts," Society for Investigative Dermatology 2024 Annual Meeting, Dallas, TX, May 15-18, 2024.

D.C. Aduba, S. Xavier, C. Wisdom, O. Lewis, J. Wang, S. Li., G.J. Klarmann, V.B. Ho, I.M. Herman & T.N. Darling. "Deploying Bioactive Peptides in Bioprinted Dermal-Epidermal Composites for Improved Skin Regeneration," Military Health System Research Symposium, Orlando, FL, August 14-17, 2023.

S. Xavier, S. Li., J. Roy, J. Wang, D.C. Aduba, I.M. Herman & T.N. Darling. "Use of Next Generation Bioactive Peptides in Skin Substitutes to Promote Wound Healing and Skin Regeneration," Military Health System Research Symposium,

Orlando, FL, August 14-17, 2023.

J. Roy, D.C. Aduba, S. Li., J. Betz, J. Wang, V.B. Ho & T.N. Darling. "A Simplified Culture Protocol that Preserves Hair Follicle Neogenesis in Grafted Dermal-Epidermal Constructs," Military Health System Research Symposium, Orlando, FL, September 11-15, 2022.

D.C Aduba, Jr., E. Margareta, A.E.C. Marnot, K.A. Valentine, W.A. Surbey, N.A. Chartrain, A.M. Whittington, T.E. Long & C.B. Williams. "3D printed acid-cleavable polyethylene glycol methacrylate gels using vat photopolymerization," 3D Bioprinting: Physical and Chemical Processes, Applied Physics Reviews, Winston-Salem, NC, May 1-3, 2017.

Local/Regional Meetings

M. Hermes, D.C. Aduba, Jr, C. Wisdom, O. Lewis, G. Klarmann, & T.N. Darling. "Physical testing of acellular collagen as a component of bioengineered skin," The 2023 Summer Scholars Program, Uniformed Services University of the Health Sciences, Bethesda, MD, August 18, 2023.

W.B. Rittase, J.E. Slaven, D.C. Aduba, Jr. J. Roy, J. Wang, S. Xavier, M.G. Olson, D.T. Bradfield, J.G. Kiang, I.M. Herman, T.N. Darling & R.M. Day. "A novel animal model to investigate treatments of Cutaneous Radiation Injuries and Combined Injuries," The 2023 Summer Scholars Program, Uniformed Services University of the Health Sciences, Bethesda, MD, May 17, 2023.

Research outputs

A Novel Approach to Pattern Dermal Papilla Spheroids in Dermal–Epidermal Composites Using Non-Adherent Microwell Arrays

Wisdom, E. C., Aduba, D. C., Lewis, O., Xavier, S., Phillips, E. O. N., Gilchrist, K. H., Herman, I. M., Ho, V. B., Darling, T. N. & Klarmann, G. J., 21 Nov 2025, In: Bioengineering. 12, 12, p. 1281 1281.

A Matrix-Derived Bioactive Peptide Enhances Epidermal Thickness and Hair Follicle Neogenesis in Grafted Dermal–Epidermal Composites

Xavier, S., Roy, J., Li, S., Klover, P. J., Thangapazham, R. L., Wang, J. A., Aduba, D. C., Raiciulescu, S., Sperling, L. C., Herman, I. M. & Darling, T. N., Jan 2025, In: Wound Repair and Regeneration. 33, 3, p. e70036 e70036.

Particle generation of low vapor pressure analytes for an on-demand aerosol standard

Roberts, J. G., Katilie, C. J., Aduba, D. C., Giordano, B. C. & Collins, G. E., 2021, In: Aerosol Science and Technology. 56, 2, p. 134-145 12 p.

An investigation of build orientation on shrinkage in sintered bioceramic parts fabricated by VAT photopolymerization

Aduba, D. C., Feller, K. D. & Williams, C. B., 2020, p. 2326-2340. 15 p.

Electrospun gelatin–arabinoxylan ferulate composite fibers for diabetic chronic wound dressing application

Aduba, D. C., An, S. S., Selders, G. S., Yeudall, W. A., Bowlin, G. L., Kitten, T. & Yang, H., 24 Jul 2019, In: International Journal of Polymeric Materials and Polymeric Biomaterials. 68, 11, p. 660-668 9 p.

Vat photopolymerization 3D printing of acid-cleavable PEG-methacrylate networks for biomaterial applications

Aduba, D. C., Margareta, E. D., Marnot, A. E. C., Heifferon, K. V., Surbey, W. R., Chartrain, N. A., Whittington, A. R., Long, T. E. & Williams, C. B., Jun 2019, In: Materials Today Communications. 19, p. 204-211 8 p.

Vat photopolymerization of charged monomers: 3D printing with supramolecular interactions

Wilts, E. M., Pekkanen, A. M., White, B. T., Meenakshisundaram, V., Aduba, D. C., Williams, C. B. & Long, T. E., 28 Mar 2019, In: Polymer Chemistry. 10, 12, p. 1442-1451 10 p.

Electrospinning of plant oil-based, non-isocyanate polyurethanes for biomedical applications

Aduba, D. C., Zhang, K., Kanitkar, A., Serrine, J. M., Verbridge, S. S. & Long, T. E., 5 Aug 2018, In: Journal of Applied Polymer Science. 135, 29, 46464.

Polysaccharide fabrication platforms and biocompatibility assessment as candidate wound dressing materials

Aduba, D. C. & Yang, H., Mar 2017, In: Bioengineering. 4, 1, 1.

Fabrication, characterization, and in vitro evaluation of silver-containing arabinoxylan foams as antimicrobial wound dressing

Aduba, D. C., An, S. S., Selders, G. S., Wang, J., Andrew Yeudall, W., Bowlin, G. L., Kitten, T. & Yang, H., 1 Oct 2016, In: Journal of Biomedical Materials Research - Part A. 104, 10, p. 2456-2465 10 p.

Electrospinning of PEGylated polyamidoamine dendrimer fibers

Aduba, D. C., Overlin, J. W., Frierson, C. D., Bowlin, G. L. & Yang, H., 22 Jun 2015, In: *Materials Science and Engineering C*. 56, p. 189-194 6 p.

Semi-interpenetrating network (sIPN) gelatin nanofiber scaffolds for oral mucosal drug delivery

Aduba, D. C., Hammer, J. A., Yuan, Q., Andrew Yeudall, W., Bowlin, G. L. & Yang, H., 2013, In: *Acta Biomaterialia*. 9, 5, p. 6576-6584 9 p.