Kristen Dellinger, Ph.D.

Associate Professor of Nanoengineering
Joint School of Nanoscience and Nanoengineering
North Carolina A&T State University

kdellinger@ncat.edu
336-285-2868
Greensboro, NC

RESEARCH SPECIALIZATION

Chemical and biomedical engineer applying nanotechnology to challenges in human health and disease. Research focuses on (1) functionalizing nanoparticles and 2D platforms to create integrated biosensors for biomedical and environmental applications; (2) designing surface-enhanced Raman spectroscopy (SERS)-based biosensors for early detection of multifactorial diseases such as cancer and Alzheimer's disease; and (3) enhancing the diagnostic and therapeutic potential of extracellular vesicles through stimuli-responsive nanoengineering.

EDUCATION

Ph.D., Biomedical Engineering — McGill University, Montréal *2009–2015*

M.Sc., Chemical Engineering — Queen's University, Kingston *2007–2009*

B.Sc., Chemical Engineering — Queen's University, Kingston, Canada *2003–2007*

ACADEMIC & PROFESSIONAL APPOINTMENTS

Tenured Associate Professor of Nanoengineering — NC A&T	*July 2025 – Present*
Assistant Professor of Nanoengineering — NC A&T	*2019 – June 2025*
Senior Research Scientist — Kepley BioSystems Inc.	*2018 – 2019*
NSF-SENIC Research Associate — UNC Greensboro	*2016 – 2019*
Laboratory Manager / Lecturer — High Point University	*2015 – 2016*

ACTIVE FUNDING (SELECTED)

- **DEVCOM Soldier Center —** Advanced Materials for Chemical and Biological Sensor Technology to Protect the Soldier. Lead PI. $700,000 (2022–2027).
- **NIH NIGMS SuRE R16 —** A Diagnostic Platform for Extracellular Vesicle-Derived Tau: Toward Early Detection of Alzheimer's Disease. PI. $562,952 (2023–2027).
- **NSF HBCU-EiR —** Stimuli-Responsive Exosomes for Quantitative Biosensing. PI. $499,488 (2023–2026).
- **North Carolina Innovation —** Biopolymer-Isolated Bovine Milk Extracellular Vesicles for Enhanced Therapeutic Delivery in Neurological Diseases. PI. $369,024 (2024–2026).
- **NSF I-Corps —** National Program. PI. $50,000 (2026).
- **NC Biotechnology Center —** Advanced Filtration System for Nutrient Restoration and Optimization of Clean-in-Place Processes in the Dairy Industry. PI. $37,500 (2025–2026).

HONORS & AWARDS (SELECTED)

- Department of Nanoengineering Award for Excellence in Undergraduate Mentoring, NC A&T (2026)
- Outstanding Young Investigator Award, NC A&T (2025)
- Department of Nanoengineering Award for Excellence in Research, NC A&T (2023, 2025)
- Featured Cover Page, Advanced Materials Interfaces (2025)
- Top 10% Most-Viewed Papers of 2023, 2024 Advanced Functional Materials
- NC TraCS KL2 Scholar Fellowship (2020–2023)

SELECTED PEER-REVIEWED PUBLICATIONS

.

1. Kemunto G, Dellinger K* (2026). Therapeutic applications of stimuli-based release and engineering of extracellular vesicles. *Advanced NanoBioMed Research*. DOI: 10.1002/anbr.202500173
2. Ebrahimi F, Ebrahimi F, Kumari A, Al Abdullah S, Dellinger K* (2026). AI-assisted customizable SERS-based aptasensor for rapid and sensitive detection of tau protein. *Analysis & Sensing*. DOI: 10.1002/anse.202500071
3. Ebrahimi F, Kumari A, Al Abdullah S, Vivero-Escoto JL, Dellinger K* (2025). Surface functionalization of citrate-stabilized gold nanoparticles with disease-specific aptamers: RSM-based optimization for multifactorial disease biomarker detection. *ACS Sensors*. DOI: 10.1021/acssensors.4c02722
4. Al Abdullah S, Ghadami S, Khan MAR, Ebrahimi F, Nowlin K, Ignatova T, Dellinger K* (2025). A SERS-based antibody–aptamer sandwich assay for extracellular vesicle-associated tau detection using gold nanoparticles. *Advanced Sensor Research*. DOI: 10.1002/adsr.202500034
5. Ghadami S, Dellinger K* (2025). Developing and optimizing a biocompatible tauopathy model using extracellular vesicle-mediated gene delivery. *Frontiers in Medicine – Gene and Cell Therapy*, 12. DOI: 10.3389/fmed.2025.1672046
6. Ebrahimi F, Kumari A, Dellinger K* (2024). Integration of nanoengineering with artificial intelligence and machine learning in surface-enhanced Raman spectroscopy (SERS) for the development of advanced biosensing platforms. *Advanced Sensor Research*. DOI: 10.1002/adsr.202400155
7. Al Abdullah S, Najm L, Ladouceur L, Ebrahimi F, Shakeri A, Al-Jabouri N, Didar T*, Dellinger K* (2023). Functional nanomaterials for the diagnosis of Alzheimer's disease; recent progress and future perspectives. *Advanced Functional Materials*. Top 10% most-viewed, 2023. DOI: 10.1002/adfm.202302673
8. Adesoye S, Al Abdullah S, Kumari A, Pathiraja G, Nowlin K, Dellinger K* (2023). Au-coated ZnO SERS substrates: synthesis, characterization, and applications in exosome detection. *Chemosensors*, 11(11), 554. DOI: 10.3390/chemosensors11110554
9. Ghadami S, Dellinger K* (2023). The lipid composition of extracellular vesicles: applications in diagnostics and therapeutic delivery. *Frontiers in Molecular Biosciences*. DOI: 10.3389/fmolb.2023.1198044
10. Khan S, Burciu B, Filipe C, Li Y, Dellinger K*, Didar T* (2021). DNAzyme-based biosensors: immobilization strategies, applications, and future prospective. *ACS Nano*. 25,000+ views. DOI: 10.1021/acsnano.1c04327

PATENTS & INTELLECTUAL PROPERTY

- Methods for Size-Based Isolation of Small Particles and Extracellular Vesicles. U.S. Patent Pending No. 63/810,337 (filed May 2026).
- Nanostructured Sensing Substrates, Chips and Methods of Fabrication. U.S. Patent Pending No. 63/774,247 (filed March 2026).
- Microstructured Modular Device for Particle Capture, Storage, and Analysis. U.S. Provisional Patent No. 63/894,036 (provisional filed October 2025).
- Amphiphilic Hybrid Nanomaterials. U.S. Patent No. 11,031,151 (issued).

TEACHING

- NANO 882: Advanced Biomedical Nanomaterials (Spring 2021–2026)
- NANO 782: Techniques in Synthetic Biology (Fall 2020–2025)
- NANO 703: Principles of Nanoengineering: Chemical-Biochemical Principles (Winter 2020)

RESEARCH MENTORING & ADVISING

- Primary Research Advisor: 12 current Ph.D. students, 2 current M.S. students, 5 completed Ph.D. dissertations.
- Postdoctoral Mentor: 1 current postdoctoral researcher.
- Undergraduate Advisor: 20+ undergraduate researchers mentored to date.
- Outreach Mentor: 25+ high school and community college interns through Draelos Summer Scholars, Semi-BELLS, IN-RELPS, and SENIC REU.

SELECTED SERVICE & LEADERSHIP

- Vice Chair, NC A&T Institutional Biosafety Committee (2025–Present); Member (2020–Present).
- Committee Chair, JSNN Assistant Professor Search Committee — Neuroscience cluster hire (Spring 2026).
- Faculty Advisor, Materials Research Society Student Chapter at JSNN (2022–Present).
- NIH Reviewer, Various Panels (2023–Present).
- NSF Review Panelist, Various Panels (2021, 2023–2025).
- Congressionally Directed Medical Research Program (CDMRP) Panel Reviewer (2024).
- Peer Reviewer for Small, Bioengineering, Analytical Biochemistry, Journal of Extracellular Vesicles, and Aquaculture Reports.

PROFESSIONAL MEMBERSHIPS

- International Society for Extracellular Vesicles (ISEV), Member (2025–Present)
- Society for Biomaterials (SFB), Member (2023–2024)