

ANDREA A. JOSEPH

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I. EDUCATION

University of Pennsylvania, Philadelphia, PA

Postdoctoral Researcher, Department of Obstetrics & Gynecology

June 21, 2021—present

University of Washington, Seattle, WA

Ph.D. Chemical Engineering, awarded May 21, 2021

Thesis title: Biodegradable polymeric nanoparticles for the treatment of neonatal brain injury

Johns Hopkins University, Baltimore, MD

B.S. Chemical and Biomolecular Engineering, awarded May 18, 2016

II. HONORS and AWARDS

2021	Outstanding Women in Innovation Award, Society of Women Engineers at UW
2020	Faculty Lecture Award, UW Chemical Engineering
2020	High Impact Publication Award, UW Chemical Engineering
2020	Krieger-Brockett Travel Award, UW Chemical Engineering
2020	AIChE Biomaterials Graduate Student Award Session (Finalist)
2020	Collegiate Rapid Fire Competition, 2 nd place, Society of Women Engineers
2020	Schmidt Science Fellowship Nominee, UW
2020	Husky 100 Awardee, UW
2019	Graduate School Conference Travel Award, UW Graduate School
2019	NIH Training Course in Neurotherapeutics Discovery and Development Attendee
2018-2021	NIH F31 Fellow (8 th percentile)
2018	Travel Grant, UW Graduate & Professional Student Senate
2017	National Science Foundation Graduate Research Fellowship Honorable Mention
2016	Runstad Family Endowed Fellowship Recipient
2016	Centennial Conference Champions, Johns Hopkins University Varsity Tennis
2013-2016	Engineering Dean's List, Johns Hopkins University
2013-2016	Thomas J. Watson Memorial Scholarship

III. PUBLICATIONS (*Co-first; Corresponding)

1. **A. Joseph**, C. Nyambura, D. Bondurant, K. Corry, D. Beebout, T. Wood, J. Pfaendtner, E. Nance. Formulation and efficacy of catalase-loaded nanoparticles for the treatment of neonatal hypoxic-ischemic encephalopathy, *Pharmaceutics*. (2021)
2. H. Helmbrecht, **A. Joseph**, M. McKenna, M. Zhang, E. Nance. Governing Transport Principles for Nanotherapeutic Application in the Brain, *Current Opinions in Chemical Engineering*. (2020)
3. **A. Joseph***, R. Liao*, M. Zhang, H. Helmbrecht, M. McKenna, J. Filteau, E. Nance. Nanoparticle-microglial interaction in the ischemic brain is modulated by injury duration and treatment, *Bioengineering & Translational Medicine*. (2020)
4. V. Yellepeddi, **A. Joseph**, E. Nance. Pharmacokinetics of Nanotechnology-Based Formulations in Pediatric Populations, *Advanced Drug Delivery Reviews*. (2019)
5. **A. Joseph**, T. Wood, C. Chen, K. Corry, J. Snyder, S. Juul, P. Parikh, E. Nance. Curcumin-loaded polymeric nanoparticles for neuroprotection in neonatal rats with hypoxic ischemic encephalopathy, *Nano Research*. (2018)

6. J. Smith*, K. G. Sprenger*, R. Liao, **A. Joseph**, E. Nance, J. Pfaendtner, Determining Dominant Driving Forces Affecting Controlled Protein Release from Polymeric Nanoparticles, *Biointerphases*. (2017)
7. G. Duncan, J. Jung, **A. Joseph**, A. Thaxton, N. West, M. Boyle, J. Hanes, J. S. Suk, Microstructural alterations of Sputum in Cystic Fibrosis Lung Disease, *JCI Insight*. (2016)

In preparation

8. **A. Joseph**, G. Simo, T. Gao, N. Alhindi, D. Graham, L. Gamble, E. Nance. Surfactants influence polymer nanoparticle fate in the brain, *Biomaterials* (revisions due September 2021)

Report of Invention/ Provisional Patent

1. E. Nance, **A. Joseph**., C. Nyambura, J. Pfaendtner, T. Wood. Formulation and efficacy of enzyme-loaded polymeric nanoparticles. Provisional Patent Application 63/221,827, filed 7/14/2021

IV. PRESENTATIONS (*Presenting author)

Oral presentations

1. **A. Joseph***, G. Bondurant, A. Rios, D. Beebout, E. Nance. Catalase-loaded polymeric nanoparticles for neuroprotection after hypoxic-ischemic injury. *Controlled Release Society Annual Meeting*. Montreal, Canada; Virtual. (July 25, 2021)
2. **A. Joseph***, E. Nance. Faculty Lecture Award: Engineering nanotherapeutics for neonatal brain injury. *UW Chemical Engineering Departmental Seminar*. Seattle, WA. (November 23, 2020)
3. **A. Joseph***, G. Simo, T. Gao, N. Alhindi, E. Nance. Graduate Student Award Session: Surfactant effects on nanotherapeutic fate within the brain. *AIChE Annual Meeting*. San Francisco, CA; Virtual. (November 17, 2020)
4. J. Filteau*, R. Liao, **A. Joseph**, E. Nance. Organotypic brain slices as a platform for measuring response to biological stimuli. *AIChE Annual Meeting*. San Francisco, CA; Virtual. (November 16, 2020)
5. E. Nance*, **A. Joseph**, R. Liao, K. Hildahl. Engineering nanomedicine to overcome biological barriers for improved treatment of pediatric brain diseases. *AIChE Annual Meeting*. San Francisco, CA; Virtual. (November 16, 2020) *Invited Plenary
6. **A. Joseph***, E. Nance. Collegiate Awards Session: Can nanoparticles treat brain disease? *Society of Women Engineers Annual Meeting*. New Orleans, LA; Virtual. (November 6, 2020)
7. E. Nance*, M. McKenna, C. Curtis, R. Liao, **A. Joseph**. Nanotechnology-based probes of structure-function in living tissue. *Clemson University Department of Chemical Engineering seminar series*. Clemson, SC; Virtual. (Sept 11, 2020)
8. A. Rios*, **A. Joseph**, E. Nance. Nanoparticle Delivery of Protein Therapeutics to Treat Neuronal Death in Hypoxic Ischemic Encephalopathy. *UW Undergraduate Research Symposium*. Seattle, WA; Virtual. (August 19, 2020)
9. **A. Joseph***, E. Nance. Can nanoparticles treat brain disease? *Town Hall Science Speaker Series*. Seattle, WA; Virtual. (June 15, 2020)
10. E. Nance*, M. McKenna, C. Curtis, R. Liao, **A. Joseph**. Nanotechnology-based probes of structure-function in living tissue. *Johns Hopkins University School of Pharmacy Seminar Series*. Baltimore, MD. (January 8, 2020)
11. **A. Joseph***, G. Simo, T. Gao, E. Nance. Effect of surfactant size and structure on biodegradable nanoparticle interaction with the brain microenvironment. *Society for Biomaterials UW Chapter Biomaterials Day*. Seattle, WA. (December 10, 2019)
12. E. Nance*, M. McKenna, C. Curtis, R. Liao, **A. Joseph**. Nanotechnology-based probes of structure-function in living tissue. *AIChE Annual Meeting*. Orlando, FL. (November 12, 2019) *Invited Plenary
13. **A. Joseph***, E. Nance. Nanoparticle design for drug delivery to the neonatal brain. *Graduate Student Symposium*. Seattle, WA. (September 19, 2019)

14. R. Liao, **A. Joseph**, T. Wood, S. Juul, E. Nance*. Nanotherapeutic modulation of inflammation and oxidative stress in neonatal brain injury. *Distinguished Lecture Series in Cardiovascular Medicine*. Seattle, WA. (January 21, 2019)
15. **A. Joseph**, R. Liao, K. Corry, T. Wood, S. Juul, P. Parikh, E. Nance*. Nanotherapeutics for neuroprotection in the developing brain. *AIChE Annual Meeting*. Pittsburgh, PA. (October 29, 2018)
16. M. McKenna, C. Curtis, **A. Joseph**, R. Liao, E. Nance*. Nanotherapeutics for neuroprotection in the injured brain. *University of Colorado Department of Chemical and Biological Engineering*. Boulder, CO. (October 11, 2018)
17. **A. Joseph**, R. Liao, E. Nance*. Nanotherapeutics for neuroprotection in the injured perinatal brain. *Houston Methodist Department of Nanomedicine Seminar Series*. Houston, TX. (July 27, 2018)
18. **A. Joseph**, T. Wood, C. Chen, K. Corry, J. Snyder, S. Juul, P. Parikh, E. Nance*. Curcumin-loaded polymeric nanoparticles for the treatment of neonatal hypoxic-ischemic encephalopathy. *Pediatric Academic Societies Annual Meeting*. Toronto, Canada. (May 6, 2018)
19. C. Curtis, M. McKenna, **A. Joseph**, R. Liao, E. Nance*. Nano-based probes of the diseased brain: directing therapeutic intervention. *BioNanoMed Annual Meeting*. Graz, Austria. (April 26, 2018)
20. **A. Joseph***, T. Wood, C. Chen, K. Corry, J. Snyder, S. Juul, P. Parikh, E. Nance. Curcumin-loaded brain penetrating nanoparticles for the treatment of neonatal brain injury. *UW Biomaterials Seminar Series*. Seattle, WA. (March 8, 2018)
21. M. Mallya*, **A. Joseph**, E. Nance. The Evaluation of Various Surfactants on PLGA and PLGA-PEG Nanoparticles. *STEMM Prep Symposium*. Seattle, WA. (August 11, 2017)

Teaching lectures and workshops

22. **A. Joseph***, D. Peer*, L. Mendes*, N. Lamson*. Back to Normal vs New Normal: Round Table Panel. *Controlled Release Society Annual Meeting*. Montreal, Canada; virtual. (July 15, 2021)
23. **A. Joseph***, C. McNicholas*, J. O'Connor*, A. Duvall*, Y. Venkataraman*. Communication with Science-Averse Audiences. *Science Talk '21*. Seattle, WA. (March 24, 2021)
24. **A. Joseph***. Nanomedicine uses in neurodegeneration. *UW Chemical Engineering 434/534: Physiological processes in engineering nanomedicine*. Seattle, WA. (March 10, 2021)
25. **A. Joseph***, C. McNicholas*, J. O'Connor*, M. Garrett*. How to Talk Science and Discuss Controversial Topics. *UW Engage*. Seattle, WA. (March 2, 2021)
26. **A. Joseph***. Statistics in Biological Research. *UW Chemical Engineering 436: Chemical Engineering Laboratory I*. Seattle, WA. (November 10, 2020)
27. **A. Joseph***. Essential Communication Skills for Scientists. *Controlled Release Society Annual Meeting*. Valencia, Spain. (June 14, 2020)

Poster presentations

28. **A. Joseph***, G. Bondurant, A. Rios, D. Beebout, E. Nance. Catalase-loaded polymeric nanoparticles for neuroprotection after hypoxic-ischemic injury. *12th Hershey Conference on Developmental Brain Injury*. Virtual. (June 3rd, 2021)
29. **A. Joseph***, R. Liao, M. Zhang, H. Helmbrecht, M. McKenna, J. Filteau, E. Nance. Injury severity impacts nanoparticle delivery to microglia in the injured brain. *Conte Symposium on Neuro-Immune Interactions*. Virtual. (March 24th, 2021)
30. **A. Joseph***, R. Liao, M. Zhang, H. Helmbrecht, M. McKenna, J. Filteau, E. Nance. Injury severity impacts nanoparticle delivery to microglia in the injured brain. *Controlled Release Society Annual Meeting*. Virtual presentation (originally Las Vegas, NV). (July 2020)
31. **A. Joseph***, R. Liao, C. Nyambura, K. Hildahl, E. Nance. Nanotechnology for therapeutic applications in the developing brain. *Chemical Engineering Research Showcase*. Seattle, WA. (February 2020)
32. G. Simo*, **A. Joseph**, T. Gao, E. Nance. Evaluation of Surfactant Effects on Nanoparticle Toxicity in the Brain Microenvironment. *NCSU Future Leaders in Chemical Engineering Symposium*. Seattle, WA. (November 2019)

33. **A. Joseph***, T. Wood, C. Chen, K. Corry, J. Snyder, S. Juul, P. Parikh, E. Nance. Curcumin-loaded polymeric nanoparticles for neuroprotection in neonatal rats with hypoxic ischemic encephalopathy. *Biomedical Engineering Society Annual Meeting*. Philadelphia, PA. (October 2019)
34. G. Simo*, **A. Joseph**, T. Gao, E. Nance. Evaluation of Surfactant Effects on Nanoparticle Toxicity in the Brain Microenvironment. *NSF REU in Data-enabled Science and Engineering Symposium*. Seattle, WA. (August 2019)
35. **A. Joseph***, G. Simo, T. Gao, E. Nance. Surfactant choice in nanoparticle formulation drives nanoparticle behavior and fate in the brain. *Controlled Release Society*. Valencia, Spain. (July 2019)
36. **A. Joseph***, R. Liao, M. Zhang, C. Nyambura, J. Filteau, E. Nance. Nanotherapeutics for developmental brain injury. *Chemical Engineering Research Showcase*. Seattle, WA. (March 2019)
37. **A. Joseph***, R. Liao, E. Rhodes, H. Pontes, J. Pon, E. Nance. Surfactant effects on biodegradable nanoparticle behavior in the brain. *Nano Drug Delivery Symposium*. Portland, OR. (September 2018)
38. **A. Joseph***, T. Wood, C. Chen, K. Corry, J. Snyder, S. Juul, P. Parikh, E. Nance. Curcumin-loaded polymeric nanoparticles for neuroprotection in neonatal rats with hypoxic ischemic encephalopathy. New York City, NY. *Controlled Release Society*. (July 2018)
39. **A. Joseph**, T. Wood, C. Chen, K. Corry, J. Snyder, S. Juul, P. Parikh, E. Nance*. Curcumin-loaded brain-penetrating nanoparticles for neuroprotection in neonatal HIE. Asilomar, CA. *11th Hershey Conference on Developmental Brain Injury*. (May 2018)
40. C. Curtis*, **A. Joseph**, R. Liao, M. McKenna, M. Zhang, E. Nance. Nanotechnology and imaging-based platforms for the evaluation and treatment of neurological disease. Seattle, WA. *Chemical Engineering Research Showcase*. (March 2018)

V. TEACHING EXPERIENCE

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|-------------|---|
| 2017-2021 | Associates in Tutoring & Academic Consultation, <i>Advanced math & science tutor</i> |
| Summer 2019 | University of Washington, <i>Project Leader for Math Academy</i> |
| Fall 2019 | University of Washington, Chemical Engineering, <i>Teaching Assistant for Mass Transfer and Separations</i> |
| Summer 2018 | University of Washington, <i>Project Leader for Math Academy</i> |
| Fall 2015 | Johns Hopkins University, Chemical and Biomolecular Engineering, <i>Teaching Assistant for Introduction to Process Analysis</i> |
| 2015-16 | Johns Hopkins University, Introductory Chemistry, <i>Peer-Led Team Learning Leader</i> |

VI. MENTORSHIP and OUTREACH

Undergraduate Students

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| 2020-2021 | Denise Beebout, Chemical Engineering Bachelor's student
NSF REU, Fall 2020 |
| 2020-2021 | Ana Rios, Biongeering Bachelor's student
UW STAR Program, Summer 2020 |
| 2019-2021 | Norah Alhindi, Molecular and Cellular Biology Bachelor's student
KAUST Scholar |
| 2019-2020 | Tora Gao, BS in Chemical Engineering
<i>Current position:</i> PhD student at UCLA Chemical and Biomolecular Engineering |
| 2018-2020 | Georges Simo, BS in Chemical Engineering and Biochemistry
Mary Gates Research Scholarship, Class of 1954 Scholarship, 2020 Husky 100 Recipient, Spence Scholarship
<i>Current position:</i> Engineer at Bristol Myers Squibb, Seattle |
| 2018 | Hugo Pontes, BS in Chemical Engineering
CoMotion Fellowship, WRF Fellowship (2019, 2020), Honors Thesis candidate, 2020 Husky 100 Recipient
<i>Current position:</i> PhD student at NIH Oxford-Cambridge Scholars program |
| 2017-2020 | Jessica Pon, BS in Chemical Engineering |

2017-2018 Emily Rhodes, BS in Chemical Engineering
2018 Center for Sensorimotor Neural Engineering Scholarship
Current position: PhD student at University of Colorado Boulder, Chemical and
Biological Engineering
2017-2018 Andrew Kirk, BS in Chemical Engineering
2017-2018 Catherine Panlillio, BS in Chemical Engineering
2017-2018 Sanchit Gad, BS in Chemical Engineering
2017-2018 Alex Choe, BS in Chemical Engineering

High School Students

2020 Maria Sati, Bellevue WA
2018 Sanjana Janakiraman, Bellevue WA
2017 Meghan Mallya, Austin TX, STEMMPREP

Outreach

2020 Introduce a Girl to Renewable Energy, ACES booth lead
2019 Science demonstration at Horizon Elementary School, Mukilteo School District
2019 Engineering Discovery Days, Nance Lab booth lead
2018 Women in Science and Engineering Conference (UW), Volunteer
2018 Engineering Discovery Days, Nance Lab booth lead
2017 Engineering Discovery Days, Nance Lab booth lead
2017 Introduce a Girl to Nano, Nance Lab booth lead

VII. EXTRACURRICULAR ACTIVITIES

2020-2021 Director of GradSWE, Society of Women Engineers at UW, Seattle WA
2020-present Treasurer, Young Scientists Committee, International
2020-2021 Board member, Engage Science Communication, Seattle WA
2019-2021 Graduate Student Liaison, Faculty Council on Women in Academia, Seattle WA
2019 President, Association of Chemical Engineering Graduate Students, Seattle WA
2018 Fundraising and event chair, Association of Chemical Engineering Graduate Students,
Seattle WA
2018-2020 Sponsorship Chair, Young Scientists Committee, International
2017-2018 Vice President, Women in Chemical Engineering, Seattle WA
2016-2017 Social Director, Women in Chemical Engineering, Seattle WA
2014-2016 Mentor, Thread, Baltimore MD
2013-2016 Peer Tutor, Peer-Led Team Learning, Baltimore MD
2013-2015 Vice President, Club Tennis, Baltimore MD

VIII. MEMBERSHIPS

American Institute of Chemical Engineers
Controlled Release Society
Society of Women Engineers
Society of Reproductive Investigation
Tau Beta Pi Engineering National Honor Society