

## ADANE S. NIGATU

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### OBJECTIVE

An enthusiastic biomedical research scientist with a keen interest in the development of drug and gene delivery systems pursuing Research Assistant Professor position.

### CORE COMPETENCIES

- Extensive background on development and synthesis of protein/polymer/liposome-based vectors for gene and drug delivery
- Skills in the characterization of nanoparticles *in vitro* and *in vivo* models
- Adept in operation and design of batch, plug flow, and fluidized bed reactors and distillation columns
- Experience in teaching undergraduate and graduate level courses in Chemistry
- Outstanding collaborative and leadership skills in technically and culturally diverse environment
- Proficient in developing the design of experiment, processing, analyzing, interpreting and validating experimental data, and preparing technical reports and manuscripts

### EDUCATION

<b>Ph.D. in Chemical Engineering</b> Oklahoma State University, Stillwater, OK, USA Dissertation: <i>Improvement of an adenovirus-based gene vector: synthetic materials that reduce immunogenicity and function in place of the fiber protein</i>	<b>Aug 2012 – May 2015</b>
<b>M.Sc in Chemical Engineering</b> Oklahoma State University, Stillwater, OK, USA Thesis: <i>Evaluation of cell penetrating peptide/adenovirus particles for transduction of CAR-negative cells</i>	<b>Jan 2009 – Dec 2012</b>
<b>B.S in Chemical Engineering</b> Bahir Dar University, Bahir Dar, Amhara, Ethiopia	<b>Sept 2001 – Jun 2006</b> <i>cum laude</i>

### PROFESSIONAL EXPERIENCE

<b>Research Assistant professor</b> , University of New Hampshire UNH, Durham, NH	<b>Feb 2024 – Present</b>
<b>Research Scientist</b> , Hubbard Center for Genome Studies, UNH, Durham, NH	<b>Mar 2022 – Jan 2024</b>
<b>Lecturer</b> , Rose State College, Midwest City, OK	<b>Jun 2018 – Jul 2018</b>
<b>Lecturer</b> , University of Central Oklahoma, Edmond, OK	<b>Dec 2017 – May 2018</b>
<b>Researcher</b> , Animal Models Core, OSU, Stillwater, OK	<b>May 2017 – Dec 2017</b>
<b>Adjunct Lecturer</b> , University of Central Oklahoma, Edmond, OK	<b>Jul 2016 – Dec 2017</b>
<b>Researcher</b> , Laboratory of Nanomedicine and Targeted Therapy, OSU, Stillwater, OK	<b>Jun 2016 – Jun 2017</b>
<b>Research and Teaching Assistant</b> , Oklahoma State University, Stillwater, OK	<b>Jan 2009 – May 2015</b>

### RESEARCH EXPERIENCE

- Analysis of genomic materials with Next-Generation Sequencing*
- COVID Sequencings surveillance, molecular biology based processing and analysis
  - Support genomics projects including sample preparation for NGS analysis
- Analysis of mouse models of pulmonary diseases*
- Implemented respiratory dynamics analysis using Flexivent FX (SciReq) on knockout mice colonies
  - Conducted BALF collection and analysis for various respiratory disease models
- Synthesis of low-temperature liposome for controlled drug delivery*
- Synthesized low-temperature sensitive liposomes impregnated with chemotherapy drug for Focused Ultrasound and Alternating Magnetic Field mediated drug delivery
  - Developed Elastin-like polypeptide based temperature sensitive liposomes for antimicrobial therapy
- Formulation of hybrid viral vector for gene delivery*
- Developed recombinant fiber-modified adenovirus
  - Synthesized a safe and efficient cell penetrating peptide-based hybrid adenovirus gene delivery vector
  - Implemented techniques for the production of lentivirus and retrovirus gene delivery vector
  - Characterized viral nanoparticles both *in vitro* and *in vivo* models

### TEACHING EXPERIENCE

<i>University of New Hampshire</i>		
<i>Spring 2024 - Fall 2024</i>	<i>BMCB 658</i>	<i>General Biochemistry</i>
<i>University of Central Oklahoma</i>		
<i>Fall 2016- Spring 2018</i>	<i>CHEM 1014</i>	<i>Introductory Chemistry</i>
<i>Rose State college</i>		
<i>Summer 2018</i>	<i>CHEM 1135</i>	<i>General Chemistry</i>

## TECHNICAL SKILLS

- **Technical:** Library preparation, DNA and RNA extraction, NGS Sequencing on Illumina, Ion Torrent, and PacBio platforms, gene expression analysis, ddPCR, RT-PCR, spectrophotometry, NMR, DSC, DLS, GPC, HPLC, SEC, TEM, SEM, DNA gel electrophoresis, fluorescence microscopy, flow cytometry, Immunohistochemistry, ELISA, plasmid preparation, adenoviral, retroviral and lentiviral production and transfection, cell and microbial culture, DNA/RNA isolation, tissue and BALF collection, intranasal instillation, intraperitoneal injection
- **Computer:** Visual Basic Applications, Python, Bash, ChemCAD, ChemDraw,

## PUBLICATIONS

- S. Vupputuri, L. Tayebi, R.S.H. Koralege, **A.S. Nigatu**, M. Mozafari, A. Mishra, L. Liu, and J.D. Ramsey "Polyethylene glycol–modified DOTAP: cholesterol/adenovirus hybrid vectors have improved transduction efficiency and reduced immunogenicity." *Journal of Nanoparticle Research* volume 23, Article #: 37 (2021)
- **A.S. Nigatu**, H. Ashar, S. N. Sethuraman, R. Wardlow, D. Maples, J. Malayer and A. Ranjan "Elastin-like polypeptide incorporated thermally sensitive liposome improve antibiotic therapy against musculoskeletal bacterial pathogens" *International Journal of Hyperthermia*, Volume 34, - Issue 2, Pages 201-208, 2018
- I. Munaweera, S. Shaikh, D. Maples, **A.S. Nigatu**, S.N. Sethuraman, A. Ranjan, D.E. Greenberg and R. Chopra "Temperature-sensitive liposomal ciprofloxacin for the treatment of biofilm on infected metal implants using alternating magnetic fields" *International Journal of Hyperthermia*, Volume 34, Issue 2, Pages 189-200, 2018
- G. Kupgan, S.P. Choudhari, **A.S.Nigatu**, N. Flynn, S. Vupputuri, W.D Picking, W.L. Picking, and J.D. Ramsey, "Identification of Excipients for Stabilizing Fiberless Adenovirus as Biopharmaceuticals." *J Pharm Sci*, (2017)
- **A. S. Nigatu**, S. Vupputuri, N. Flynn, and J.D. Ramsey, "Effects of Cell-Penetrating Peptides on Transduction Efficiency of PEGylated Adenovirus" *Biomedicine & Pharmacotherapy*, Volume 71, Pages 153-160, 2015.
- **A. S. Nigatu**, N.A. Alhakamy, C.J. Berkland, and J.D. Ramsey, "Gene Delivery Applications of Noncovalently Associated Cell-Penetrating Peptides." *Therapeutic Delivery*, 4 (6), 741 – 575, 2013.
- **A. S. Nigatu**, S. Vupputuri, N. Flynn, B.J. Neely, and J.D. Ramsey, "Evaluation of Cell Penetrating Peptide-Adenovirus particles for Transduction of CAR-Negative Cells." *J Pharm Sci*, 102 (6), 1981-1993, 2013.

## CONFERENCE PRESENTATIONS

- N. Poudel, P. Sivasami, M. Achanta, **A.S. Nigatu**, M. Hinsdale, "Xylosyltransferase I deficiency alters lung mechanics and susceptibility to LPS induced acute lung injury" *Biochemistry and Molecular Biology Symposium, Oklahoma State University, September 14, 2017.*
- S. Vupputuri, **A.S. Nigatu**, L. Tayebi, L. Liu, and J.D. Ramsey, "Gene Delivery using a PEGylated DOTAP: Cholesterol/Adenovirus Hybrid Vector." *Oklahoma Center for Respiratory and Infectious Diseases Annual Research Retreat, Stillwater OK, April 2015.*
- G. Kupgan, S.P. Choudhari, N.H. Flynn, **A.S. Nigatu**, S. Vupputuri, W.D. Picking, W.L. Picking, and J.D. Ramsey, "Stabilization of a Fiberless Adenovirus Gene Vector." *AICHE Annual Meeting, San Francisco, CA, November 2013.*
- **A.S. Nigatu**, G. Kupgan, and J.D. Ramsey, "Genetic and Chemical Modification of Adenovirus for the Development of a Safe and Effective Gene Therapy Vector." *Oklahoma State University Research Symposium, February 21, 2013.*
- **A.S. Nigatu** and J.D. Ramsey, "Development of an Adenovirus Gene Therapy Vector with Improved Transduction Efficacy and Reduced Innate and Adaptive Immune Response." *AICHE Annual Meeting, Pittsburg, PA, October 30, 2012.*
- **A.S. Nigatu** and J.D. Ramsey, "Adenovirus/Cell Penetrating Peptide Nanoparticles for Transduction of Difficult-to-Transform Cell Lines." *Oklahoma State University Research Symposium, February 24, 2012.*
- **A.S. Nigatu** and J.D. Ramsey, "Development of an Improved Adenovirus Gene Therapy Vector That Employs Cell Penetrating Peptides for Transformation of Difficult to Infect Cell Lines." *Oklahoma State University Research Symposium, February 23, 2011.*
- **A.S. Nigatu** and J.D. Ramsey, "Development of an Improved Adenovirus Gene Therapy Vector that Employs Cell-Penetrating Peptides for Transformation of Difficult-to-Infect Cell Lines." *AICHE Annual Meeting, Salt Lake City, UT, November 7-12, 2010.*
- S.S. Karode, I. Pal, **A.S. Nigatu**, and J.D. Ramsey, "Design and Development of a Hybrid Gene Delivery Vector." *OCAST Health Research Conference, April 22, 2010.*
- **A.S. Nigatu** and J.D. Ramsey, "Formulation Variables for Optimizing Gene Delivery Efficiency of CPP-Ad and CPP-PEG-Ad Nanoparticles." *Oklahoma State University Research Symposium, February 17, 2010.*

## LEADERSHIP EXPERIENCE

<b>Undergraduate Researchers Mentor</b> , OSU, Stillwater, OK	<b>2011, 2013, 2014, 2017</b>
<b>Grantsmanship:</b> Chemical Engineering Graduate Students Associations, OSU, Stillwater, OK	<b>2012-2013</b>
<b>Pledge Master:</b> Honor Society of Omega Chi Epsilon, Mu Chapter	<b>2010-2011</b>

## PROFESSIONAL ACTIVITIES

<b>Mentor for Undergraduate Researchers</b>	<b>2011 2013, 2014</b>
<b>Judge for Research Presentations</b> , <i>Oklahoma State University Research Symposium</i>	<b>Feb 2014</b>

## PROFESSIONAL MEMBERSHIP

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American Institute of Chemical Engineers (AIChE), OSU chapter	<b>Feb 2009 – Present</b>
Omega Chi Epsilon, Chemical Engineering Honorary Society, OSU Chapter	<b>Sept 2009 – Present</b>
Junior Engineer, Association of Chemical Engineers, Addis Ababa, Ethiopia	<b>Sept 2005 – Nov 2007</b>

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## PROFESSIONAL DEVELOPMENT ACTIVITIES

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Transformative Learning Conference, <i>University of Central Oklahoma, Edmond, OK</i>	<b>Mar 2017</b>
Process Safety Seminar Series, <i>Oklahoma State University, Stillwater, OK</i>	<b>2010, 2011, 2012, 2013, 2014</b>
1st Annual Graduate Teaching Assistant Conference, <i>Oklahoma State University, Stillwater, OK</i>	<b>Aug 2014</b>
CEAT Development Series: 3D printing Workshop, <i>Oklahoma State University, Stillwater, OK</i>	<b>Nov 2014</b>
ASQ Lean Six Sigma Yellow Belt, <i>Oklahoma City, OK</i>	<b>Sep 2018</b>

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## REFERENCE

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Available upon request

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