

**GERGANA G. NESTOROVA, PhD**  
Assistant Professor of Biological Sciences  
MSNT Program Chair  
Louisiana Tech University  
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### **EDUCATION**

- Ph.D. Molecular Sciences and Nanotechnology, Louisiana Tech University** August 2014  
Dissertation: “*Thermoelectric Method for Performing ELISA*”.
- B.S. Biology, Coastal Carolina University** August 2006

### **EXPERIENCE**

#### **Louisiana Tech University, Ruston, LA**

MSNT Program Chair, September 2017-current  
Assistant Professor of Biological Sciences, September 2016-current  
MSNT Program Coordinator, September 2016-August 2017

#### **Louisiana Tech University, Ruston, LA**

Research Assistant Professor, Biological Microfluidic Lab, September 2014-August 2016  
Project 1: Solid-phase gene extraction method for mRNA purification from low cell number.  
Project 1: Lab-on-a-chip technology for assessing radiation induced genetic mutation.

#### **BioSense Labs, LLC, Ruston, LA**

Co-Founder, April 2015- December 2016  
Microfluidic technologies for microRNA analysis and pathogen surveillance.

#### **Bioventions, LLC, Ruston, LA**

Scientist I, June 2012- June 2013  
Project: Microfluidic platform for DNA sequencing.

#### **Stanford University, Stanford, CA**

Research Assistant II, Human Immune Monitoring Center, January 2007-February 2009  
Project 1: Genetic mechanism of *Arabidopsis* in response to environmental stress  
Project 2: Transcriptome alteration of diabetic heart and its effect on increased risk of cardiac death

### **RESERCH INTERESTS**

- Role of microRNAs in DNA repair
- Single cell analysis: methods for purification and extraction of microRNAs and proteins
- Lab-on-a-chip technologies for genomic and proteomic research
- Microfluidic technologies for ultrasensitive detection of miRNAs

### **TECHNICAL SKILLS**

- DNA sequencing, PCR, high-resolution melting analysis
- Design and fabrication of microfluidic devices
- Gene expression, methylation and miRNA microarray technology
- Enzyme-linked immunosorbent assays
- Functionalization and immobilization of biological molecules

- Capillary Electrophoresis with laser induced detection (CE-LIF)
- Confocal microscope, scanning electron microscope (SEM), atomic force microscope (AFM)

### GRANTS

- LaSPACE Research Enhancement Award Program (REA) (PI): Exosomal microRNA expression as biomarkers for assessment of radiation-induced neurological injury. \$34,230. 09/01/2018-08/21/2019.
- LaSPACE LURA (PI): Effect of radiation on mitochondrial mass and oxidative activity. \$6,000. 09/01/2018-08/31/2019.
- LaSPACE LURA (PI): Effect of high-energy radiation on the formation of 8-hydroxydeoxyguanosine. \$6,000. 09/01/2018-08/31/2019.
- Louisiana Board of Regents Research Competitiveness Subprogram (RCS) (PI): ExoSense: Lab-on-a-chip Platform for Solid-Phase Purification of Exosomes. \$131,835. 06/2018-06/2021.
- LaSPACE LURA (PI): Effect of radiation on the rate of mitochondrial DNA damage and repair, \$6,000. 09/2017-08/2018.
- Board of Regents Support Fund Superior Graduate Fellows in Molecular Sciences and Nanotechnology 2016-2021 (Co-PI). \$100,000. 08/2016-07/2021. PI: Dr. Ramu Ramachandran,
- NSF SBIR Phase I and IB (PI): Thermoelectric DNA Sequencer for Mutation Detection, award #1141957, \$175,000. 01/2012-12/2012.

### PUBLICATIONS SUMMARY

- 13 research papers in peer-reviewed journals
- 1 book chapter
- 25 conference presentations, abstracts and acknowledged paper contributions
- 7 grants (PI or Co-PI)
- 2 provisional patent
- 2 report of invention

### INTELLECTUAL PROPERTY DISCLOSURE

1. **G. G. Nestorova**, “Thermoelectric ELISA Method for Detection of Nucleic Acid, RNA, and Bacteria Cells”, provisional patent, serial number 62/268, 941, filed 12/17/15 by Louisiana Tech University.
2. **G. G. Nestorova**, “Thermoelectric ELISA Method for Detection of Nucleic Acid, RNA, and Bacteria Cells”, Report of Invention #2015-05 filed with Louisiana Tech University Office of Intellectual Property and Commercialization May 2015.
3. **G. G. Nestorova**, “Thermoelectric Method for Performing ELISA”, provisional patent, serial number 62/107,613, filed 1/26/15 by Louisiana Tech University.
4. **G. G. Nestorova**, “Thermoelectric Method for Performing ELISA”, Report of Invention #2013-19, filed with Louisiana Tech University Office of Intellectual Property and Commercialization, December 2013.

### PUBLISHED PEER REVIEWED JOURNAL PAPERS

5. S. M. I. Bari, L. Reis, and **G. G. Nestorova**, Calorimetric sandwich-type immunosensor for quantification of TNF- $\alpha$ . *Biosensors and Bioelectronics*. 2018;
6. **G. G. Nestorova**, K. Hasenstein, N. Nguyen, M. A. DeCoster and N. D. Crews, Lab-on-a-chip mRNA purification and reverse transcription via a solid-phase gene extraction technique. *Lab on a chip*. 2017; 17(6): 1128-36.

7. **G. G. Nestorova**, B. S. Adapa, V.L. Koppaarthi and E. J. Guilbeau. Lab on a Chip Label-free DNA Biosensor for Detection of Nucleic Acid Sequence. *Sensors and Actuators B: Chemicals*. 2016; 225: 174-80.
8. **G. G. Nestorova**, N. D. Crews, and E. J. Guilbeau. Theoretical and experimental analysis of thermoelectric lab-on-a-chip ELISA. *Microfluidics and Nanofluidics*. 2015; 19(4): 963-72.
9. **G. G. Nestorova**, V.L. Koppaarthi, N. D. Crews, and E.J. Guilbeau. Thermoelectric lab-on-a-chip ELISA. *Analytical Methods*. 2015;7 (5):2055-63.
10. L. Shi, E. J. Guilbeau, **G. G. Nestorova**, and W. Dai. A mathematical model and numerical method for thermoelectric DNA sequencing. *Heat and Mass Transfer*. 2014; 50(5): 1–17.
11. C. Zhang, **G. G. Nestorova**, R. A. Rissman, and J. Feng, Detection and quantification of 8-hydroxy-2'-deoxyguanosine in Alzheimer's transgenic mouse urine using capillary electrophoresis. *Electrophoresis*. 2013; 34 (15): 2268-74.
12. V. L. Koppaarthi, S. M. Tangutooru, **G. G. Nestorova**, and E. J. Guilbeau, Thermoelectric microfluidic sensor for bio-chemical applications. *Sensors and Actuators B: Chemical*. 2012; 166: 608-15.
13. S. M. Tangutooru, V. L. Koppaarthi, **G. G. Nestorova**, and E.J. Guilbeau., Dynamic thermoelectric glucose sensing with layer-by-layer glucose oxidase immobilization. *Sensors and Actuators B: Chemical*. 2012; 166: 636-41.
14. **G. G. Nestorova**, and E. J. Guilbeau, Thermoelectric Method for Sequencing DNA. *Lab on a Chip*. 2011; 11 (10): 1761-69.
15. S. M. Tangutooru, V. L. Koppaarthi, R. Gumma, **G. G. Nestorova**, and E. J. Guilbeau., Dynamic Thermoelectric Microfluidic Glucose Sensing with layer-by-layer Glucose Oxidase Immobilization. *International Journal of Medical Implants and Devices*. 2011; 5 (2): 66.
16. J. Walley, D. Kelley, **G. G. Nestorova**, D. Hirschberg, and K. Dehesh, Arabidopsis deadenylation AtCAF1a and AtCAF1b play overlapping and distinct roles in mediating environmental stress responses. *Journal of Plant Physiology*. 2010; 152 (2): 866-75.
17. K. D. Wilson, Z. Li, R. Wagner, P. Yue, P. Tsao, **G. G. Nestorova**, M. Huang, D. Hirschberg, P. Yock, T. Quartermoust, and J. Wu, Transcriptome Alteration in the Diabetic Heart by Rosiglitazone: Implications for Cardiovascular Mortality. *PLoS ONE*. 2008; 3(7): e2609.

### **BOOK CHAPTER**

18. **G. G. Nestorova**, Thermoelectric Lab-On-A-Chip Technologies: Design, Applications, Challenges, and Future Trends, *Advances in Engineering Research*. 2017; (19), Ed. Victoria M. Petrova, Publisher: Nova Science Publishers, Inc.,

### **CONFERENCE PAPERS AND ABSTRACTS**

19. S. M. I. Bari, L. G. Reis, G. G. Nestorova, Microfluidic calorimetric immunosensor: experimental results and COMSOL simulations of heat transfer in microchannel, APS 2019 March Meeting, Boston, MA. Presenting author.
20. C. D. Nwokwu, S. M. I. Bari, G. G. Nestorova, Platform for Solid-Phase and Antigen-Specific Purification of Exosomes, 35<sup>th</sup> *Southern Biomedical Engineering Conference (SBEC)*
21. S. M. I. Bari, L. G. Reis, G. G. Nestorova, Lab-on-a-chip thermoelectric immunoassay for detection of TNF- $\alpha$ : experimental results and COMSOL simulations of heat transfer, 35<sup>th</sup> *Southern Biomedical Engineering Conference (SBEC)*
22. K. H. Hutson, C. D. Nwokwu, K. M. Willis, C. Vazquez, K. H. Hutson, G. G. Nestorova, Identification of miRNA-OGG1 mRNA interactions: small RNA sequencing and immunoprecipitation analysis, *LaSPACE Council Fall Meeting*, Shreveport, LA, 2018.
23. K. M. Willis, C. D. Nwokwu, K. H. Hutson, G. G. Nestorova, Effect of high-energy radiation on mitochondrial DNA copy number changes and 8OHdG levels in human astrocytes, *LaSPACE Council Fall Meeting*, Shreveport, LA, 2018.

24. S. M. Bari, G.G. Nestorova, Lab-on-a-chip immunoassay for thermoelectric quantification of TNF- $\alpha$ , *34<sup>th</sup> Southern Biomedical Engineering Conference (SBEC) MAS 2018*; 63:132, suppl.1. Presenting author.
25. K. H. Hutson, K. M. Willis, A. Y. Xiao, L. Harrison, **G. G. Nestorova**, Identification of novel miRNAs that regulate OGG1 mediated DNA repair, *LaSPACE Council Fall Meeting*, Baton Rouge, LA, 2017
26. S. M. Bari, **G. G. Nestorova**, Lab-on-a-chip thermoelectric ELISA for detection of TNF- $\alpha$ , *Industry day conference*, Shreveport, LA, 2017.
27. K. H. Hutson, K. M. Willis, A. Y. Xiao, L. Harrison, **G. G. Nestorova**, Identification of novel miRNAs that regulate OGG1 mediated DNA repair, *Industry day conference*, Shreveport, LA, 2017.
28. K. Willis, **G.G. Nestorova**, OGG1 role in oxidative stress induced DNA damage and repair, 2017 *ANS Research Symposium*, Louisiana Tech University, LA, 2017.
29. T. Pham, M. Hamideh, K. Willis, and **G. G. Nestorova**, Lab-on-a-chip thermoelectric ELISA technology for quantitation of TNF- $\alpha$ , 2017 ANS Research Symposium, Louisiana Tech University, LA.
30. **G.G. Nestorova**, K. Hasenstein, and N.D. Crews, Lab-on-a-chip-mediated RNA extraction via steel solid phase gene extraction probes, *LaSPACE Council Fall Meeting*, Ruston, LA, 2016.
31. **G.G. Nestorova**, K. Hasenstein, N. Nguyen, M. DeCoster, N. D. Crews. Lab-on-a-chip mediated RNA purification from 3D cell spheroids via solid-phase gene extraction technique, *2016 ASME Meeting*, Washington, DC, 2016. Presenting author.
32. D. Jana, D. Saint Jean, S. Abdurakhimov, V. Kopparchy, **G.G. Nestorova**, N. Pal, N. Nguyen, P. Derosa, L. Sawyer, N. Crews, and M. DeCoster, Genetic Assessment of the Space Environment using MEMS Technologies, *2016 APS March meeting*, Baltimore, MD, 2016. Presenting author.
33. **G.G. Nestorova**, K. Hasenstein, and N.D. Crews, Lab-on-a-chip-mediated RNA extraction via steel solid phase gene extraction probes, *Industry day*, LSUHS-Shreveport, LA, 2015.
34. **G.G. Nestorova**, N.D. Crews, and E.J. Guilbeau, Mathematical Simulations of Heat transfer and Fluid Dynamics in a Microfluidic Calorimeter with Integrated Thin-film Thermopiles, *2014 Annual Fall Meeting of the BMES*, San Antonio, TX, 2014.
35. **G.G. Nestorova**, V.L. Kopparchy, S.M. Tangutooru, R. Gumma, and E.J. Guilbeau, Effect of Hydrodynamic Focusing on Increased Sensitivity of Thermoelectric Method for DNA Sequencing, *2011 Annual Fall Meeting of the BMES*, Hartford, CT, 2011.
36. V.L. Kopparchy, S.M. Tangutooru, R. Gumma, **G.G. Nestorova**, and E.J. Guilbeau, Highly Sensitive Continuous Flow Micro-calorimeter for Biological Applications, *2011 Annual Fall Meeting of the BMES*, Hartford, CT, 2011.
37. **G.G. Nestorova**, V.L. Kopparchy, S.M. Tangutooru, R. Gumma, and E.J. Guilbeau, Thermoelectric method for sequencing by synthesis, *Lab-on-a-chip World Congress*, San Francisco, CA, 2011.
38. **G.G. Nestorova**, V.L. Kopparchy, S.M. Tangutooru, R. Gumma, and E.J. Guilbeau, Thermoelectric method for sequencing by synthesis, *Louisiana Academy of Science 85th Annual Meeting*, Monroe, LA, 2011.
39. S.M. Tangutooru, R. Gumma, V.L. Kopparchy, **G.G. Nestorova**, and E.J. Guilbeau, Fabrication and Characterization of Highly Sensitive Thin-Film Thermopiles, *Louisiana Academy of Science 85th Annual Meeting*, Monroe, LA (2011).
40. S.M. Tangutooru, V.L. Kopparchy, R. Gumma, **G.G. Nestorova**, E.J. Guilbeau, Dynamic Thermoelectric Glucose sensing with Layer-by-layer Glucose Oxidase Immobilization, *SBEC 27<sup>th</sup> Annual Meeting*, Arlington, TX, 2011.
41. J. Feng, C. Zhang, S. Wang, H. Xia H, B. Hollins, G. Chen, J. Spaulding, M. Circu, C. Rodriguez, **G.G. Nestorova**, M. Decoster, K. Murray, S. Soper, and T.Y. Aw, Monitoring Protein Oxidative damage in aging and Alzheimer's disease, *LBRN 9th Annual Meeting*, Shreveport, LA, 2011.

42. V.L. Koppa, S.M. Tangutooru, R. Gumma, **G.G. Nestorova**, and E.J. Guilbeau, Characterization of Microfluidic calorimeter for measuring small dynamic temperature changes, *2010 BMES Annual meeting*, Austin, TX, 2010.
43. **G.G. Nestorova**, C. Zhang, and J. Feng, Quantitative determination of 8OHdG in Alzheimer transgenic mice urine using capillary electrophoresis with laser induced fluorescence detection, *SFRBM 17<sup>th</sup> Annual Meeting*, Orlando, FL, 2010.

#### **ACKNOWLEDGED CONTRIBUTIONS**

44. Shen-Orr, S., Tibshirani, R., Khatri, P., Bodian, DL et al., Cell type-specific gene expression differences in complex tissues. *Nature Methods* 7, 287 – 289 (2010).
45. Pespeni, M., Oliver, T., Manier, M., and Palumbi, S., Restriction Site Tiling Analysis: accurate discovery and quantitative genotyping of genome-wide polymorphisms using nucleotide arrays. *Genome Biology* 11: R44 (2010).

#### **MENTORING**

##### Graduate students (chair)

- 2018-present Deriesha Gains, PhD Engineering Micro and Nanoscale Systems  
 2017-present Saif Mohamad Ishraq Bari, PhD Engineering Micro and Nanoscale Systems  
 2017-2018 Saif Mohamad Ishraq Bari, MS Molecular Sciences and Nanotechnology
- CBERS research scholarship recipient
- 2017-present Chukwumaobim Daniel Nwokwu, PhD Molecular Sciences and Nanotechnology

##### Graduate students (committee)

- 2018-present Yaswanthi Yanamadala, PhD Molecular Sciences and Nanotechnology  
 2018-present Morgan Nall, MS Molecular Sciences and Nanotechnology  
 2018-present Rebecca Hodnett, MS Biology  
 2018-present Victor Ojo, PhD Molecular Sciences and Nanotechnology  
 2018-present Andrew Roser, PhD Molecular Sciences and Nanotechnology  
 2016-present Zilong Li, PhD Computational analysis and modeling  
 2016-present Meichen Lui, PhD Biomedical Engineering  
 2016-present Yue Li, PhD Biomedical Engineering  
 2017-present Sreelakshmi Venigalla, PhD Molecular Sciences and Nanotechnology  
 2017-present Chris Miller, PhD Molecular Sciences and Nanotechnology  
 2017-present Neela Parajapati, PhD Biomedical Engineering  
 2017-present Shauna Tranter, MS Engineering  
 2017-present Nam Nguen, PhD Biomedical Engineering  
 2017-present Hannah Green, MS Engineering Biomedical Engineering  
 2017-2018 Nam Nguen, MS Molecular Sciences and Nanotechnology  
 2017-2018 Urna Kansakar, MS Molecular Sciences and Nanotechnology  
 2016-2017 William Grimes, PhD Molecular Sciences and Nanotechnology

##### Undergraduate students

- 2018-present Parker Willmon, BS Biomedical Engineering  
 2016-present Kaitlynn Willis, BS Biology
- LaSPACE LURA 2017-2018
  - LaSPACE LURA 2018-2019
- 2017-present Kristen Hudson, BS Biology
- ANS undergraduate research mini-grant
  - LaSPACE LURA 2018-2019
- 2017-present Carolina Vazquez, BS Biology  
 2016-2017 Mohamad Hamideh, BS Biomedical Engineering

- CBERS research scholarship
- 2016-2017      Tatiana Pham, BS Biomedical Engineering
- CBERS research scholarship

**TEACHING**

- Biotechnology principles (MSE 512, BISC 450C, BISC 516C, MSNT 657, MSNT 510)
- Graduate endocrinology (BISC 406, BISC 506, MSNT 510, MSNT 657)
- Protein analysis (BISC 492, BISC 592, MSNT 510, MSNT 657)
- Doctoral enhancement seminar (MSNT 611)
- Molecular sciences and nanotechnology seminar (MSNT 504)