

**GERGANA G. NESTOROVA, PhD**  
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MSNT Program Chair  
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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 (Dr. Niel D. Crews), 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.

#### **Biovations, 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 mcrRNAs 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 Lased Induced Detection (CE-LIF)
- Confocal microscope, scanning electron microscope (SEM), atomic force microscope (AFM)

### **GRANTS**

- NSF SBIR Phase I and IB (PI): Thermoelectric DNA Sequencer for Mutation Detection, award #1141957, \$175,000. 01/2012-12/2012.
- 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,
- LaSPACE LURA (PI): Effect of radiation on the rate of mitochondrial DNA damage and repair, \$6,000. 09/2017-08/2018.

### **PUBLICATIONS SUMMARY**

- **12** research papers in peer-reviewed journals
- **1** book chapter
- **22** conference presentations, abstracts and acknowledged paper contributions
- **2** provisional patent
- **2** report of invention

### **INTELECTUAL 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. **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.
6. **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.
7. **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.
8. **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.
9. 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.
10. 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.

11. V. L. Koppaarthu, 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.
12. S. M. Tangutooru, V. L. Koppaarthu, **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.
13. **G. G. Nestorova**, and E. J. Guilbeau, Thermoelectric Method for Sequencing DNA. *Lab on a Chip*. 2011; 11 (10): 1761-69.
14. S. M. Tangutooru, V. L. Koppaarthu, 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.
15. J. Walley, D. Kelley, **G. G. Nestorova**, D. Hirschberg, and K. Dehesh, Arabidopsis deadenylases AtCAF1a and AtCAF1b play overlapping and distinct roles in mediating environmental stress responses. *Journal of Plant Physiology*. 2010; 152 (2): 866-75.
16. 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**

17. **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**

18. 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.
19. 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
20. S. M. Bari, **G. G. Nestorova**, Lab-on-a-chip thermoelectric ELISA for detection of TNF- $\alpha$ , *Industry day conference*, Shreveport, LA, 2017.
21. 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.
22. K. Willis, **G.G. Nestorova**, OGG1 role in oxidative stress induced DNA damage and repair, 2017 *ANS Research Symposium*, Louisiana Tech University, LA, 2017.
23. 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.
24. **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.
25. **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.
26. D. Jana, D. Saint Jean, S. Abdurakhimov, V. Koppaarthu, **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.
27. **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.

28. **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.
29. **G.G. Nestorova**, V.L. Koppaarth, 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.
30. V.L. Koppaarth, 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.
31. **G.G. Nestorova**, V.L. Koppaarth, 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.
32. **G.G. Nestorova**, V.L. Koppaarth, 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.
33. S.M. Tangutooru, R. Gumma, V.L. Koppaarth, **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).
34. S.M. Tangutooru, V.L. Koppaarth, R. Gumma, **G.G. Nestorova**, E.J. Guilbeau, Dynamic Thermoelectric Glucose sensing with Layer-by-layer Glucose Oxidase Immobilization, *SBEC 27th Annual Meeting*, Arlington, TX, 2011.
35. 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.
36. V.L. Koppaarth, 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.
37. **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 17th Annual Meeting*, Orlando, FL, 2010.

#### **ACKNOWLEDGED CONTRIBUTIONS**

38. 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).
39. 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)

2017-present Saif Mohamad Ishraq Bari, PhD Engineering Micro and Nanoscale Systems

- CBERS research scholarship recipient

2017-present Chukwumaobim Daniel Nwokwu, PhD Molecular Sciences and Nanotechnology

##### Graduate students (committee)

2018-present Urna Kansakar, MS 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 Nam Nguen, 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 recipient

2017-present Kristen Hudson, BS Biology

- ANS research mini-grant recipient

2017-present Carolina Vazquez, BS Biology  
2016-2017 Mohamad Hamideh, BS Biomedical Engineering

- CBERS research scholarship recipient

2016-2017 Tatiana Pham, BS Biomedical Engineering

- CBERS research scholarship recipient

#### 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)