Curriculum Vitae

Seratna Guadarrama-Beltrán, PhD

Associate Professor of Medicine
Microbiology
Department of Medical Education Integrated Service Unit
University of Texas Rio Grande Valley
School of Medicine

Contact Information

ETBLC 2.106.
1210 W. Schunior St.
Edinburg, TX. 78541
Office phone: (956) 296-1447
Email: Seratna.guadarrama@utrgv.edu

Education & Training

Ph.D. in Microbiology, Moyne Institute of Preventive Medicine, Trinity College -University of Dublin, Republic of Ireland.

M.Sc. in Microbiology, Montana State University-Bozeman, USA.

M.Sc. in Molecular and Cellular Biology, University of Alabama-Huntsville, USA.

B.Sc. in Microbiology and Chemistry, *Honors,* University of Texas- El Paso, USA.

Work Experience

09/2024 – Present, Associate Professor of Medicine-Microbiology. Department of Medical Education Integrated Service Unit, School of Medicine, University of Texas-Rio Grande Valley.

09/2018 – 07/2024, Assistant Professor of Medicine-Microbiology. Department of Medical Education and Department of Microbiology and Immunology School of Medicine, University of Texas-Rio Grande Valley.

01/2015 – 05/2018, Lecturer. Department of Health and Biomedical Sciences University of Texas-Brownsville.

05/2013 – 07/2014, Science Writer/Communicator. Singapore Center for Environmental Life Sciences Engineering, Nanyang Technological University, Singapore.

10/2008 – 05/2012, Research & Teaching Assistant. Department of Microbiology, The Moyne Institute of Preventive Medicine, Trinity College Dublin, The University of Dublin, Dublin, Ireland.

01/2007 – 05/2007, Adjunct Microbiology Lecturer. Department of Biology, Hamline University, St. Paul, MN. USA.

08/2006 – 05/2007, Research Specialist. Bio-Technology Institute. University of Minnesota. St. Paul, MN. USA.

08/2003 – 05/2006, Research & Teaching Assistant. Department of Microbiology and Immunology Montana State University. Bozeman, MT. USA.

05/2001 – 08/2001 & 05/2002 – 08/2002, NASA Microbiology Instructor/Spaceflight Counselor & Lead. Space flight and Life Sciences Summer Training Program (SLSTP), NASA & Tuskegee University, Kennedy Space Center, FL. USA.

08/2000 – 05/2001, Science Lecturer (Bilingual). Department of Biology, Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) Campus Toluca, México.

01/1998 – 12/1999, Research & Teaching Assistant. Department of Biology, University of Alabama. Huntsville, AL. USA.

10/1994 – 05/1997, Undergraduate Research Assistant. Department of Microbiology and Immunology, University of Texas. El Paso, TX, USA

Professional Memberships

- Member, AAMC, non-elected, 2023 to date
- Member of the American Society for Microbiology, non-elected, RGV and Texas Chapter, 2018 to date
- Member of the American Society for Microbiology, non-elected, 2018 to date

Honors & Awards

11/06/2024. Keynote Speaker Award. "Journey and Discovery into Space Microbiology (Microbial Responses to Altered Gravity)." Presented at the Mexico-American University of the North (UMAN) Research Seminar Series, Reynosa, Mexico.

05/11/2024. Medical Education Teaching Certificate Program Award. Successful completion of program. Program designed to enhance professional development as a medical educator. Hybrid format. The University of Texas Rio Grande Valley-School of Medicine, Edinburg, TX.

04/26/2024. Best Undergraduate and Graduate Oral Presentation Award. Title: Periodontitis and Alzheimer's Disease: A Magnetic Link. Oral Presentation, Alhassan, T.,

Alhassan, N., Zerfu, M., Quinones, M., Lopez-Alvarenga, J.C., and Guadarrama-Beltrán, S., UTRGV College of Science Annual Research Conference.

04/20/2024. Best Undergraduate and Graduate Poster Presentation Award. Title: The Role of Oral Microbiota in Periodontitis and Alzheimer's Disease. Poster Presentation. Alhassan, T., Alhassan, N., Zerfu, M., Rodrig, Quinones, M., Lopez-Alvarenga, J.C., and Guadarrama-Beltrán, S., National Student Research Forum at UTMB Galveston.

05/2024. Medical Education Teaching Certificate Program Award. Successful completion of program. Program designed to enhance professional development as a medical educator. Hybrid format. May, The University of Texas Rio Grande Valley-School of Medicine, Edinburg, TX.

09/2023 Admissions Committee Award. In appreciation for the dedication and commitment as appointed member to the School of Medicine Admissions Committee. September, University of Texas-RGV-School of Medicine. Edinburg, TX.

2016, 2018, 2022 & 2024 Community Service. In appreciation for serving as a Judge at the Annual Biomedical Research Conference for Minority Students (ABRCMS). November 9-12. Tampa, FL, Indianapolis, IN, Washington, DC., and Pittsburgh, PA.

2017, 2019, 2020 & 2023 Community Service. In appreciation for serving as a Science Fair Judge at the Rio Grande Valley Regional Science and Engineering Fair, University of Texas-RGV, Brownsville, TX. Every February.

2017 through 2019 Community Service. For contributing to the dissemination of science in the community. R. Longoria Elementary, Brownsville, TX. Every November.

2016 through 2018 Community Service. For contributing to the dissemination of science in the community. The Brownsville Children's Museum. TX. Every September.

10/2015 Civic Engagement and Service. For contributing to the dissemination of science in the community. The Office of Civic Engagement, The University of Texas at Brownsville, TX.

06/2005 ESA and ISGP "Young Researcher" Award. European Space Agency (ESA) and the International Society of Gravitational Physiology (ISGP) joint Conference "Life in Space for Life on Earth". 26th Annual Gravitational Physiology Meeting. Cologne, Germany.

09/2004 to 09/2005 INBRE-BRIN Fellowship Scholar. Idea Networks for Biomedical Research Excellence and Biomedical Research Infrastructure Network. Montana State University. Bozeman, MT.

11/2004 Research Conference- Oral Presentation. Topic: The Effect of Microgravity on the Virulence of *Pseudomonas aeruginosa*. American Society of Gravitational and Space Biology, ASGSB. New York, NY.

2001-2002 NASA Microbiology Instructor/Team Leader. Certification of Leadership. Space flight and Life Sciences Summer Training Program (SLSTP), NASA, Kennedy Space Center, FL.

1998 NASA Space Shuttle Flight Mission STS-95. Payload Experiment (Ground Control) Participant. University of Alabama-Huntsville and Kennedy Space Center, Cocoa Beach, FL.

1995-1997 William Staley Research Scholarship Award. University of Texas. El Paso, TX.

1996 Resident Assistant of the Year and Emerging Leader Award. University of Texas. El Paso, TX.

Research Focus

Dr. Guadarrama-Beltrán's laboratory research focuses on the human oral microbiota and its role in neurodegenerative diseases, and on the microbial infection capacity (virulence) in microgravity conditions, including Near-Earth Extraterrestrial Environments (NEEEs). Her laboratory research goals are based on the development of enhanced microgravity simulators (bioreactors), lunar simulation chambers, and artificial intelligence (AI) technology in order to:
1) Model the risks and control the factors to which space crew members are continuously exposed, including potential microbial threats, cosmic radiation, and lunar/martian dust.
2) Develop best practices for health protection in the space industry, particularly the international space station (ISS) and future space missions.

Publications

Dr. Guadarrama-Beltran has made significant contributions to Space and Medical Microbiology as evidenced by her active participation in space shuttle flights, astronaut collaborations, published manuscripts, book chapters, oral presentations and science conference/community participations.

Papers

1. Camprubi-Casas, E ., Lopez-Alvarenga, J.C., Ayati, M., Ramirez-Correa, G., Razzaque, M., Coban, S., Zuo, A., and **Guadarrama-Beltrán, S.** The Space Microbiome: Strategies for the Clinical Management of Infections in Space and Near-Earth Extraterrestrial Environments (in preparation).
2. Camprubi-Casas, E ., Lopez-Alvarenga, J.C., Ayati, M., Ramirez-Correa, G., Razzaque, M., Coban, S., Zuo, A., and **Guadarrama- Beltrán, S.** The impact of space program related research projects in medical school and high school students in the Rio Grande Valley (in preparation).
3. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.,** A Novel Non-Antibiotic option in the Treatment of Oral Cavity Bacterial Disease, (in preparation).
4. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.,** Oral Microbiome and its effect in Neuroinflammation, (in preparation).
5. **Guadarrama-Beltrán, S.,** and Dorman, C.J.D. The contribution of DNA gyrase activity to the sustained expression of the *fis* gene in Salmonella enterica during microaerobic conditions (in preparation).
6. Skovgaard, Niel, Pastorella, G., Gazzola, G., **Guadarrama, S.,** and Marsili, E. 2012. Biofilms: applications in bioremediation. Microbial Biofilms: Current Research and Applications, 73.

7. **Guadarrama, S.** 2011. The Sum of All Minorities. A personal experience in the scientific world. The College Green Journal: The Arts & Literary Journal of the Graduate Students' Union, 25. Trinity College Dublin. Dublin, Ireland.
8. **Guadarrama, S.** 2011. The Sum of All Minorities. A personal experience in the scientific world. Finalist. Nature Career Column Competition. Nature.com
9. **Guadarrama, S.,** Pulcini, E. D., Broadaway, S. C., and Pyle, B.H. 2007. Pseudomonas aeruginosa growth and production of Exotoxin A in static and modeled microgravity environments. Gravitational and Space Research. 18(2): 85-86.
10. **Guadarrama, S.,** Pulcini, E. D., Broadaway, S. C., and Pyle, B.H. 2005. Analysis of Pseudomonas aeruginosa exotoxin A production in static and modeled microgravity environments. J Gravitational Physiol. 12(1): 249-250. The European Space Agency. NASA technical reports server (NTRS).

Abstracts

1. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.,** Periodontitis and Alzheimer's Disease: A Magnetic Link. Oral Presentation. Annual Biomedical Research Conference for Minoritized Scientists. (ABRCMS), Pittsburgh, PA. November 13-17, 2024.
2. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.,** Periodontitis and Alzheimer's Disease: A Magnetic Link. Oral Presentation. 2024 UTRGV College of Science Annual Research Conference. April 26, 2024 ***Award Winner***
3. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.,** Title: The Role of Oral Microbiota in Periodontitis and Alzheimer's Disease. Poster Presentation. National Student Research Forum at UTMB Galveston. April 20, 2024. ***Award Winner***
4. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.,** The Oral-Microbiome-Brain Axis: A Thorough Review on the Relationship between Periodontitis and Alzheimer's Disease and a Proposed Innovative Application of Biomagnetism as a Means of Alternative Therapy. Poster Presentation. 7th Annual STEM Education Conference. February 26-27, 2024.
5. Alhassan, T., Alhassan, N., Zerfu, M., Rodrigues, E., Quinones, M., Lopez-Alvarenga, J.C., and **Guadarrama-Beltrán, S.**, Periodontitis and Alzheimer's Disease: A Magnetic Link. Type: Oral Presentation. 7th Annual UTRGV SOM Research Symposium. February 8, 2024.
6. **Guadarrama-Beltrán, S.** "Sustained expression of fis, the gene coding for the Fis nucleoid-associated protein, during the stationary phase of growth in Salmonella enterica," Thesis, Trinity College (Dublin, Ireland). School of Genetics and Microbiology, 2013, pp 221.
7. **Guadarrama-Beltrán, S.,** Pulcini, E. D., Broadaway, S. C., and Pyle, B.H. 2005. Analysis of Pseudomonas aeruginosa exotoxin A production in static and modeled microgravity environments. J Gravitational Physiol. 12(1): 249-250. The European Space Agency. NASA technical reports server (NTRS).
8. **Guadarrama-Beltrán, S.,** Pulcini, E. D., Broadaway, S. C., and Pyle, B.H. 2005. Analysis of Pseudomonas aeruginosa exotoxin A production in static and modeled microgravity environments. 9th European Symposium on Life Sciences in Space, 26th Annual International Gravitational Physiology Meeting, held 26 June - 1 July 2005 in Cologne, Germany. Edited by B. Warmbein. ESA-SP Vol. 585, 2005, id.102

Book Chapter

Skovgaard, Niel, Pastorella, G., Gazzola, G., **Guadarrama, S.,** and Marsili, E. 2012. Biofilms: applications in bioremediation. Microbial Biofilms: Current Research and Applications, 73.

Dissertation

Guadarrama-Beltran, S. (2013). Sustained expression of *fis*, the gene coding for the Fis nucleoid-associated protein, during the stationary phase of growth in *Salmonella enterica.* (Doctoral Dissertation). Department of Microbiology, Moyne Institute of Preventive Medicine and the School of Genetics and Microbiology, Trinity College (Dublin, Ireland).

Thesis

Guadarrama-Beltran, S. (2006). Analysis of *Pseudomonas aeruginosa* virulence in modeled microgravity conditions. (Master of Science Thesis). Department of Microbiology, Montana State University-Bozeman, USA.

Report

Guadarrama-Beltran, S. (1999). Research methods in Gravitational Biology: A Literature Review. (Master of Science Report). Department of Biology, University of Alabama-Huntsville, USA.

Space Mission Payload Experiment (Ground Control)

Guadarrama-Beltran, S. (1998). NASA Space Shuttle Flight Mission STS-95. Payload Experiment (Ground Control) Participant. University of Alabama-Huntsville and Kennedy Space Center, Cocoa Beach, FL.

Acknowledgements

1. Kitching, M., Ramani, M., and Marsili, E. 2014. Fungal biosynthesis of gold nanoparticles: mechanism and scale up. Microbial Biotechnology. DOI: 10.1111/1751-7915.12151

2. Sonawane, J. M., Marsili, E., and Chandra Ghosh, P. 2014. Treatment of domestic and distillery wastewater in high surface microbial fuel cells. International Journal of Hydrogen Energy. DOI: 10.1016/j.ijhydene.2014.07.085

3. Bourdakos, N., Marsili, E., and Mahadevan, R. 2014. A defined co-culture of *Geobacter sulfurreducens* and *Escherichia coli* in a membrane-less microbial fuel cell. Biotechnology and bioengineering, 111(4): 709-718.

4. Sheehan, K. B., McInnerney, K., Purevdorj-Gage, B., Altenburg, S. D., and Hyman, L. E. 2007. Yeast genomic expression patterns in response to low-shear modeled microgravity. BMC genomics, 8(1): 3.