

**SERATNA GUADARRAMA BELTRAN**  
Department of Immunology and Microbiology  
School of Medicine  
University of Texas Rio Grande Valley  
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## EDUCATION

- Ph.D. Microbiology. Trinity College Dublin. Dublin, Ireland. 2013  
Dissertation: Sustained expression of *fis*, the gene coding for the Fis nucleoid-associated protein, during the stationary phase of growth in *Salmonella enterica*.
- M.Sc. Microbiology. Montana State University. Bozeman, MT, USA. 2006  
Thesis: Analysis of *Pseudomonas aeruginosa* virulence in modeled microgravity conditions.
- M.Sc. Biology. University of Alabama. Huntsville, AL, USA. 1999  
Report: Research methods in Gravitational Biology: a literature review.
- B.Sc. Microbiology. University of Texas. El Paso, TX, USA. 1997  
Focus: Bacteriology, Immunology and Parasitology.

## POSITIONS AND EMPLOYMENT

### Assistant Professor 2018 -Present

Department of Immunology and Microbiology & Medical Education, School of Medicine,  
University of Texas Rio Grande Valley, TX.

Assistant Professor, main responsibilities:

- Deliver current and quality instruction (Face to Face and/or via Zoom/Panopto). Several resource sessions are taught in the following modules:
  - Molecules to Medicine (previously in Attack & Defense) Module: Microbial diseases of the human body.
  - Musculoskeletal & Dermatology Module: Infectious microbial diseases specific to the muscle, bone and skin.
  - Renal and Male Reproductive System Module: Infectious microbial diseases specific to the genitourinary and male reproductive systems.
- Serve as a B3 Bilingual and Bicultural Institute representative from UTRGV's School of Medicine, to be able to provide in the future resource sessions and laboratories also in the Spanish language.
- Provide career guidance to medical students.
- Stay current with the scientific literature, particularly regarding the microbiology of disease in normal and extreme environmental conditions.
- Design and instruct online courses in Medical Microbiology & Immunology in the Master of Medical Science program.

- Perform numerous administrative duties including being part of the Pre-Clerkship Curriculum Committee, being an Equality and Diversity Advocate, and a mentor to students in remediation programs.
- Attend activities/educational affairs workshops about how to best select NBME (National Board of Medical Examiners) test questions and improve item writing.
- Attend scientific conferences.
- Problem Based Learning (PBL) Facilitator, main responsibilities:
  - Encourage critical thinking
  - Promote teamwork
  - Identify and share pro-active approaches to problems
  - Reinforce constructive feedback
  - Highlight importance of ethical and compassionate human approach to medical cases
  - PBL Facilitator in the following modules:
    - Attack & Defense
    - Molecules to Medicine
    - Musculoskeletal & Dermal (MSKD)
    - Digestive Health
    - Mind, Brain & Behavior
    - Endocrine & Female Reproductive System
    - Renal and Male Reproductive System
    - Cardiovascular & Respiratory.

Co-Lead, Medical Microbiology (Molecules to Medicine) Module, main and shared responsibilities:

- Collaborate in the preparation of the module syllabus.
- Collaborate in the organization and planning of pre-clerkship content via resource sessions and verify that learning objectives of said sessions meet the Medical Microbiology and Immunology USMLE (US Medical Licensing Examination) requirements.
- Assign resource sessions to expert content faculty and self.
- Set-up laboratory activities to complement resource sessions accordingly.
- Collaborate in the preparation/edition/selection of assessments.
- Co-lead faculty activity within module.

## **Lecturer**

**2015-2018**

Department of Health and Biomedical Sciences, University of Texas Rio Grande Valley, Brownsville, TX.

- Developed and taught biomedical science courses including Medical Microbiology, Biomedical Research Laboratory, Independent Research and health-science online courses.
- Co-led the Medical Microbiology lecture and lab curriculum committee.

- Led and coordinated community service projects to disseminate and encourage science interest in the Brownsville community area including Microbiology Fairs at the Brownsville Children's Museum.
- Mentored students to financially aid A-list students in their application process to medical schools and/or graduate research institutions.
- Advised Volunteers Around the World (WAW) student association. Provided technical advice, and suggestions on fundraising activities to sponsor student travel to different parts of the world, where they assisted rural communities in need of medical assistance.

#### **Science Writer/Communicator**

**2013-2014**

Research Center of Excellence-Singapore Center for Environmental Life Sciences Engineering (RCE SCELSE), Nanyang Technological University (NTU), Republic of Singapore.

- Edited research manuscripts, prepared and wrote a monthly newsletter, assisted in outreach activities (school visits and open house days), wrote and updated website content, and in charge of the digital marketing of the Center.
- Assisted in research grant proposals about the air, skin and gut microbiomes.
- Liaised with website designer and helped revamp the website of the center.
- Provided assistance on the effective communication of science, either through personal communications or, by organizing seminars for expert talks.

#### **Research Assistant/Teaching Assistant**

**2008-2012**

Department of Microbiology and Preventive Medicine, Trinity College Dublin. Dublin, Ireland.

PI/Mentor: Professor Charles Dorman.

- Performed research on the sustained expression of *fis*, the gene coding for the Fis nucleoid-associated protein, in the pathogenesis of *Salmonella enterica*.
- Performed research techniques including, Western Blot, molecular and cell biology techniques (e.g. RT-PCR, gel electrophoresis, lambda recombination, transductions etc.), and ChIP on a chip DNA microarray analyses.
- Assisted in the teaching and supervision of undergraduate microbiology laboratories.

#### **Adjunct Microbiology Lecturer**

**2007**

Department of Biology, Hamline University. St. Paul, MN.

- Developed and delivered lectures for the undergraduate General Microbiology course and its laboratory component.

#### **Research Specialist**

**2006-2007**

Biotechnology Institute, University of Minnesota. St. Paul, MN.

Supervisor/Mentor: Dr Jeffrey Gralnick.

- Contributed in the identification and characterization of genes responsible for the fluoroquinolone antibiotic resistance in bacteria isolated from the Twin Cities wastewater plants.
- Research techniques included PCR, mutations and cloning fusions.

#### **Research Assistant/Teaching Assistant**

**2003-2006**

Department of Microbiology and Immunology, Montana State University. Bozeman, MT.

PI/Mentor: A/Professor Barry Pyle.

- Conducted research on the effect of simulated microgravity conditions on the virulence of *Pseudomonas aeruginosa*.
- Assessed bacterial pathogenesis through molecular biology and proteomic methods, including ELISA, PCR and 2-D gel electrophoresis.
- Developed and taught Principles of Microbiology and Biology courses to freshmen students.
- Designed and prepared experiments for the Microbiology Freshmen laboratories.

**NASA Microbiology Instructor/Team Leader**

**2001-2002**

Space flight and Life Sciences Summer Training Program (SLSTP), NASA, Kennedy Space Center, FL.

- Supervised and mentored undergraduate students on how to prepare and analyze microbiological samples for a space shuttle flight, and how to collaborate as a team to achieve successful missions.

**Bilingual Science Lecturer**

**2000-2001**

Department of Biology, Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) Preparatoria (High School). Campus Toluca, México.

- Delivered bilingual science instruction (English/Spanish) in the subject areas of biology, space science, and chemistry.
- Developed curriculum and student learning strategies to promote interest in the sciences.
- Assessed students in their application process to US universities.

**English as a Second Language Instructor**

**2000-2001**

Berlitz Language School. Toluca, México.

- Designed and taught English language lessons to children, university students and professionals.

**Research Assistant/Teaching Assistant**

**1998-1999**

Department of Biology, University of Alabama. Huntsville, AL.

PI/Mentor: Professor Marian Lewis.

- Conducted research on the influences of spaceflight on human lymphoid Jurkat cells.
- Assisted in preparing and examining pre- and post-flight cell DNA samples respectively, for the space shuttle mission STS-95.
- Developed and delivered courses in biology to undergraduates and non-traditional students.
- Developed laboratory exercises and supervised animal dissection experiments.

**Space Academy Lecturer and Resident Assistant**

**1997-1998**

The U.S. Space and Rocket Center. Huntsville, AL.

- Coached and lectured high-school and undergraduate students on several basic aspects and topics of astronaut training.
- Supervised Space Base (dormitories) on a 24-hr duty call, once a week, where I resolved conflict and assisted in emergencies as needed.

**Undergraduate Research Assistant****1994-1997**

Department of Microbiology, University of Texas. El Paso, TX, USA.

PI/Mentor: Professor Michael W. Lehker.

- Summer laboratory course on growth and pathogenesis of protozoan *Trichomonas vaginalis*.

PI/Mentor: Professor Eppie Rael.

- Performed Western Blot experiments to study venom proteases from the snake *Crotalus molossus molossus*.

**Resident Assistant****1995-1997**

Residence Halls, University of Texas. El Paso, TX, USA.

- Coordinated student activities and conciliated conflict situations in the university housing system.
- Supervised on a 24-hr duty call, once a week, the dormitories, resolved conflict and assisted in any other emergencies.

**PUBLICATIONS / PROJECTS**

1. **Guadarrama, S.**, Casas, E., Roy, U., Piedra, A.F., Dhasmana A., Sikander, M., Lopez-Alvarenga, J., and Baker, K. The impact of NASA-STEM career projects in medical, high school and middle school students in the Rio Grande Valley (project in progress).
2. **Guadarrama, 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).
3. Skovgaard, Niel, Pastorella, G., Gazzola, G., **Guadarrama, S.**, and Marsili, E. 2012. Biofilms: applications in bioremediation. Microbial Biofilms: Current Research and Applications, 73.
4. **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.
5. **Guadarrama, S.** 2011. The Sum of All Minorities. A personal experience in the scientific world. Finalist. Nature Career Column Competition. [Nature.com](http://Nature.com)
6. **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.
7. **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).

## **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](https://doi.org/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.

## **ACADEMIC MENTORING EXPERIENCE**

### **Faculty Advisor**

**2018-Present**

School of Medicine. University of Texas Rio Grande Valley.

Provide academic mentoring and remediation strategies to medical students, for the successful completion of the medical program.

### **Faculty Advisor**

**2017-2018**

Volunteers Around the World (WAW). University of Texas Rio Grande Valley.

Provided technical advice, and suggestions on fundraising activities to sponsor student travel to different parts of the world, where they are to work in rural communities in need of medical assistance.

### **Mentor and Science Tutor**

**1998-1999**

Alliance for Minority Participation (AMP). University of Alabama. Huntsville, AL.

Provided career guidance and tutoring in biology, microbiology and immunology to undergraduate students.

### **Project Leader**

**1995-1997**

Alliance for Minority Participation (AMP). University of Texas. El Paso, TX.

Developed programs to secure student completion and success in college, and to promote and maintain student interest in science careers.

## **TEACHING EXPERIENCE**

### **School of Medicine (UTRGV)**

**2018-Present**

University of Texas at Brownsville/University of Texas Rio Grande Valley (as Main Instructor (MI) and/or PBL Problem Based Learning Facilitator (PF))

- Molecules to Medicine/Attack & Defense Module (Bacteriology, Virology & Infectious Diseases)- MI & PF
- Renal & Male Reproductive Module (Infectious Disorders of the Urinary Tract & Male Reproductive System)- MI & PF
- Musculoskeletal & Dermal- MI & PF
- Mind, Brain & Behavior Module- PF
- Cardiovascular & Respiratory Module- PF
- Endocrinology and Female Reproductive System- PF

### **UTB/UTRGV**

**2015-2018**

University of Texas at Brownsville/University of Texas Rio Grande Valley (as Main Instructor)

- Advanced Medical Microbiology (BMED 4240)
- Advanced Molecular Biology (BMED 4260)
- Applied Medical Microbiology (HPRS 4316-90L-Online)
- Introduction to Medical Microbiology (BMED 1106)
- Introduction to Immunology (BMED 1107)
- Introduction to Medical Genetics and Evolution (BMED 1105 & 1109)
- Introduction to Biomedical Science I Laboratory (BMED 1102)
- Introduction to Biomedical Science II Laboratory (BMED 1111)
- Introduction to the US Healthcare System (HPRS 3301-90L-Online)
- Independent Research II (BMED 3122)
- Independent Research IV (BMED 3224)
- Independent Research IV (BMED 3224-BFRI-Biomedical Freshman Research Initiative)
- Pathobiology and Host Defense (BMED 3101)
- Pathophysiology (BMED 4295)

### **TCD**

**2009-2011**

Trinity College Dublin (as Graduate Teaching Assistant)

- General Microbiology Laboratories

### **HU**

**2007**

Hamline University (as Adjunct Lecturer)

- General Microbiology Lecture and Laboratory.

### **MSU**

**2004-2005**

Montana State University (as Graduate Teaching Assistant)

- General Microbiology Laboratories
- General Biology Laboratories

### **UAH**

**1998-1999**

University of Alabama-Huntsville (as Graduate Teaching Assistant)

- General Biology Laboratories

## **PROFESSIONAL/VOLUNTEER SERVICES**

- “Germes in Space and the Odyssey of a Hispanic Woman Scientist & Communicator,” presented at the UTRGV- College of Science & Engineering/School of Medicine, Mother & Daughter Program. Edinburg, TX, Feb 4, 2023.
- Judge, Annual Biomedical Research Conference for Minority Students (ABRCMS), Anaheim, CA, November 9-12, 2022.
- “Germes in Space,” presented at the UTRGV- College of Science & Engineering teenager Summer Camp TEXPREP. Edinburg, TX, July 15, 2022
- Served in the Interview Committee for the Astrobiology Position candidacy in the Department of Chemistry, February and March 2022.
- “Germes in Space,” presented at the International Museum of Arts and Sciences (IMAS) Summer Camp, “Mission to Mars,” McAllen, TX, June 2021.
- Served in two different occasions as the Equity & Diversity Advocate (EDA) member in hiring committees, Fall 2021.
- Interviewed by student Ms Neidye Rodriguez to discuss bacterial growth on Thanksgiving leftovers and the importance of food safety, for the UTRGV-TV newscast. November 20, 2020.
- Invited to speak about the science behind COVID-19 and how to take safety precautions. Mexican radiobroadcast program “Sin Permiso,” July 31, 2020.
- Judge, Rio Grande Valley Regional Science and Engineering Fair, University of Texas-RGV, Brownsville, TX, February 2020.
- Career Day Participant, R. Longoria Elementary, Brownsville, TX, May 2019.
- Judge, Rio Grande Valley Regional Science and Engineering Fair, University of Texas-RGV, Brownsville, TX, February 2019.
- Judge, Annual Biomedical Research Conference for Minority Students (ABRCMS), Indianapolis, IN, November 2018.
- Science Speaker, R. Longoria Elementary, Brownsville, TX, February 2018.
- Career Day Participant, R. Longoria Elementary, Brownsville, TX, May 2017.



- Judge, Rio Grande Valley Regional Science and Engineering Fair, University of Texas-RGV, Brownsville, TX, February 2017.
- Research Committee, Biomedical Sciences Department, University of Texas-RGV, Brownsville, TX, 2016-Present.
- Mission/Vision Committee, Biomedical Sciences Department, University of Texas-RGV, Brownsville, TX, 2016-2017.
- Volunteer Biology Programs Advisor, Education Department, Gladys Porter Zoo, Brownsville, TX, 2016-2017.
- Volunteer Community Service Project Coordinator with the Brownsville Children's Museum, 2015-2018.
- Judge, Freshmen Research Initiative (FRI), Research Poster Presentations, University of Texas-RGV, Brownsville, TX. December 2016.
- Judge, Annual Biomedical Research Conference for Minority Students (ABRCMS), Tampa, FL, 2016.
- Judge, Singapore Science and Engineering Fair (SSEF), 2014.
- Microbiology Volunteer Instructor, School for the Gifted, University of Minnesota, St. Paul, MN, 2007.
- Volunteer Focus-Group Associate, Hispanic Advocacy and Community Empowerment through Research (HACER) University of Minnesota, the Twin Cities, MN, 2007.
- Volunteer, Space Life Sciences Public Speaker and Coordinator, Brownsville Independent School District (BISD) and the University of Texas, Brownsville (UTB), TX, 2002-2003.

## **HONORS AND AWARDS**

### **Community Service**

**2017, 2019 & 2020**

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.

### **Community Service**

**2016, 2018 & 2022**

In appreciation for serving as a Judge at the Annual Biomedical Research Conference for Minority Students (ABRCMS). November 9-12. Tampa, FL, Indianapolis, IN, and Washington, DC.

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

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

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

**ESA and ISGP "Young Researcher" Award** **2005**  
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.

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

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

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

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

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

**PROFESSIONAL MEMBERSHIPS**

**American Society for Microbiology (ASM)** **2016-Present**

**ASM Rio Grande Valley and Texas Chapters.** **2022**

## **PROFESSIONAL DEVELOPMENT**

### **B3 Institute Bilingual/Bicultural Education Workshop** **Spring 2016 & Summer 2022**

Workshop on how to implement courses bilingually, both in the Spanish and English languages through culturally relevant approaches. The University of Texas Rio Grande Valley.

### **UTRGV Empowering Excellence Program** **2022**

Session aimed to explore how to engage students during the pandemic through student and family centered teaching. Online, March 23<sup>rd</sup>

### **UTRGV Faculty Affairs** **2022**

Equality & Diversity Advocate (EDA) Training Workshop. Online, January 27<sup>th</sup>.

### **UTRGV Teaching Excellence** **2018-Present**

Workshops on techniques and strategies to enhance student learning. The University of Texas Rio Grande Valley. Edinburg, TX.

### **Texas Regional STEM Faculty Institute** **Summer & Fall 2017**

A two-week workshop offered by the STEM Faculty Institute about teaching techniques to enhance science learning in the virtual and non-virtual classroom at the university level. South Texas College. McAllen and Weslaco, TX.

### **B3 Institute Bilingual/Bicultural Education Workshop** **Spring 2017**

Workshop on how to teach courses bilingually, both in Spanish and English through culturally relevant approaches. The University of Texas Rio Grande Valley. Brownsville, TX.

### **ITEX** **Fall 2015-Spring 2017**

Continuous all-year round training. Workshop from the Institute for Transformational Learning on how to implement hybrid instruction using virtual platforms using Apple tablets (iPADs). The University of Texas Rio Grande Valley. Brownsville, TX.

### **Teaching Large Online Courses** **Summer 2016**

A six-week workshop on lesson planning and large online course instruction. The University of Texas Rio Grande Valley. Brownsville, TX.

### **Quality Matters** **Spring 2016**

One-day intensive workshop on how to design and evaluate online courses. The University of Texas Rio Grande Valley. Brownsville, TX.

### **Science Education** **Summer 2005**

A six-week workshop on lesson planning and laboratory instruction. Montana State University. Bozeman, MT.

## **Discipline, Group Management, and Teaching Techniques**

**2000 & 2001**

All-year round training. Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) Preparatoria (High School). Campus Toluca, México.

## **RELEVANT SKILLS**

### Teaching/Mentoring

- Able to engage diverse audiences.
- Ample experience setting up medical microbiology laboratories.
- Dynamic instructor.
- Mentoring experience to diverse minority groups.
- Fully bilingual, possess experience teaching in English and in Spanish.

### Science Communication

- Innovative science outreach speaker.
- Creative and technical with the written word, as applicable.
- Website content writer.
- Excellent interpersonal communication skills.

### Time Management/Multi-Tasking

- Independent Mother of 3 children (two who are High-Functioning Autistic)
- Successfully completed Ph.D. within 5 years, while pregnant (twice), while taking care of our toddler, and while managing our family household.
- I also met many deadlines during my thesis writing, teaching and research duties.

### Science Research

- Participated in an experiment flown in a NASA Space Shuttle mission (STS-95, Oct '98).
- Project manager.
- Diligent experiment designer and dependable data analyst.
- Knowledgeable of a number of basic and advanced biology and microbiology research techniques.

### Languages

- Able to speak, read and write in four languages, English and Spanish (native proficiency), and Italian and French (intermediate proficiency).
- Reliable interpreter/translator.

## **INTERESTS**

I enjoy writing and reading about poetry, life, family, microbes, the human brain, travel, space exploration and many other diverse scientific topics, as well as volunteer to present science talks/demonstrations. I am a sunset chaser, stargazer, weight-lifting gym enthusiast and mountain climber. I also love exploring new places.