

# Sarah Mustaly

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## EDUCATION

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### **Rosalind Franklin University of Medicine & Science**

Ph.D. Neuroscience, *in pursuit*, (GPA 3.9/4.0)  
North Chicago, Illinois, USA

### **Benedictine University, Lisle, Illinois USA (2015)**

Bachelor of Science, *Magna Cum Laude* (GPA 3.8/4.0)  
Major: Biology, Minor: Chemistry  
Awards: Scholars Program & Honor's Dean List

## RESEARCH EXPERIENCE

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### **Rosalind Franklin University of Medicine & Science**

Aug. 2015-Current

Research Advisor: *Dr. Grace E. Stutzmann*

Exploring upstream mechanisms of Alzheimer's disease (AD), such as ryanodine receptor (RyR)-mediated  $\text{Ca}^{2+}$  dyshomeostasis on intracellular organelle deficits, specifically lysosomal dysfunction, autophagic clearance, and mitochondrial disruption. Modulating RyR- $\text{Ca}^{2+}$  release as a therapeutic option. Using innovative techniques, such as AD patient fibroblast reprogrammed to human induced neurons to study mechanisms and pathways present in early stages of AD. Performed  $\text{Ca}^{2+}$  imaging studies, live-cell imaging, super resolution microscopy, immunofluorescence, ELISA, mice husbandry, molecular techniques

### **Benedictine University Department of Biology**

Jan. 2014–May 2015

Research Advisor: Dr. Robert. C. McCarthy

A multi-disciplinary project aimed to predict the acoustic output made by *Homo neanderthalensis*. Recorded >100 subjects with Sound Design 702T Recorder and Beyerdynamic TG H55 omnidirectional microphone and analyzed subject's vowels to determine pitch and frequency points using Praat and Akustyk programs.

### **Benedictine University Department of Chemistry**

Aug. 2014 –May 2015

Research Advisor Dr. Nina. J. Ronkainen

Performed trace analysis of minerals and elements of berry liquor samples from Northern Europe using the Atomic Absorption Spectroscopy.

### **Loyola University Department of Microbiology & Immunology**

June 2014 –Aug. 2014

Research Advisors: Dr. Julie Swartzendruber, Dr. Katherine. L. Knight.

Summer research program: Experimented the therapeutic potential of a probiotic for treating allergic anaphylaxis by implementing a novel assay using bone-marrow derived cells to detect mast cell degranulation.

## LEADERSHIP EXPERIENCE

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*Rosalind Franklin University; North Chicago, IL*

### Graduate Student Association (GSA) Treasurer (2019-2021)

Responsible for migrating the old workflow of record keeping to a more efficient method for GSA and ASRC finance. Streamlined the budget management and resources, developed a resource for accurate and organized data collection from multiple resources, and create the end-of-the-year

budget report to the Executive Student Council (ESC). Organize and execute the approval and disbursement of GSA Travel Awards. Initiated and co-organized fundraisers, including a major ice cream social fundraiser that raised over \$400.00.

#### INSPIRE Program Coordinator, Mentor and Lecturer (2015-2019)

INSPIRE is a mentoring and applied research program for Latino high school/college level students interested in STEMM fields. Lead strategy and planning for Inspire Program, interviewed and selected candidates, facilitated meetings with students, mentors, and faculty. With students – was responsible for developing a curriculum that was engaging, yet combatible to college-level courses. In addition, created worksheets, lesson plans, and review sessions to further engagement of academic concepts along with current lab techniques. Managed student's progress in both the classroom and laboratory settings. Advised, encouraged, and provided a safe environment for students to share conflicts they experience by organizing/partaking in Women in Science discussion forums and one-on-one meetings. Lectured neuroscience classes and won the best lecturer award (2017). With Mentors-was responsible for assigning, directing, and leading mentorship discussion forums to facilitate optimal mentorship to ensure successful outcome of laboratory work and student engagement. With faculty –engaged professors and developed a long-term plan for recurring students in the lab.

One goal for me as coordinator was to improve academic standing of the INSPIRE students. By creating a more involved curriculum that involved more practice talks to improve their oral scientific presentations and multiple activities to engage the material they learned in class (homework, group projects, and review sessions), we saw increased overall examination scores from students this year compared to previous years. These data are being incorporated in a research paper for submission. In addition, we provided resources to further the student's interest in STEMM careers by organizing panels with Health Professionals/STEMM Professionals. In order to improve these student's statistics, we are working to get SAT and GRE courses involved in this program.

#### Student Library Committee/Library Advisor Committee (2017-2021)

Elected participant of the student led (2017-18) and now faculty led (2018-current) committee, whose goal is to improve the library experience. Discuss library resources and issues from the perspective of graduate students. Advocate for specific journal subscriptions and track usage of current online journal database. Organized first workshop to inform and improve literature search that was geared towards graduate students writing their qualification exams, dissertation, and research papers.

#### Art from the Benchtop Coordinator (2019-2021)

An art exhibit showcasing the artwork from biomedical researches occurring at RFUMS. Curate the exhibition, including advertising, selection of pieces, facilitating collaborations between artists, and editing placards. This position extends the creative aspect of science. As a participant for 5 years, my most notable piece involved a collaboration between a fellow graduate student where we honor Dr. Christine Blasely Ford and, in the heart of the Me Too movement, we recognize her courage to testify against then Supreme Court nominee for sexual assault. The piece was used in the Women in Science Symposia.

#### Orientation Advisor (2018)

Guided incoming students through the school and became a point of contact for them. Reached out/met with them individually to ease transition into graduate student life. On several occasions, advised and mentored first year students through lab rotations, career development, and adjustment to the local area.

### All School Research Consortium (ASRC) Coordinator (2016-2017)

Core organizer for an all-day inter-professional program that brings together every school at Rosalind Franklin University to share and communicate research. Facilitated communications between students, deans, and university community. Invited a keynote speaker, prepared symposium talks, poster presentations, and reception. Advertised and received financial support from Deans and scientific vendors. Streamlined the workflow of designing the program book by writing a form that efficiently generates a uniform abstract for each submission. This form is now being used for successive years. Created the abstract submission form, talk selection, and schedule judge assignments/recruitments. Won the commitment to research award in 2016, 2017.

### Project Dreams Lecturer (2016)

Organized and taught a basic how-to-do cell culture lecture to veterans partaking in a lab techniques course held at RFUMS

*Al Masjid Al Badri; Willowbrook, IL*

### Teaching Assistant at Saturday School (2006-Current)

Volunteer commitment for 1000+ hours. Conduct lecture as substitute teacher, plan one-to-one review study session, evaluate student's progress, uplifted the school's library by supplying it with handcrafted study guides, games and activities, and computer-based reading programs, and participate in annual conferences

## **MEMBERSHIP & AFFILIATIONS**

Graduate Student Association Member	Aug. 2015- Current
Society for Neuroscience Member	Aug. 2015- Current
ISTAART-Alzheimer's Association	July 2018-Current
Tri-Beta Biology Honors Society (Treasurer, Vice President)	Aug. 2012- May 2015

## **AWARDS**

GSA Travel Award (2018)  
ESC Travel Award (2018)  
INSPIRE Program Best Lecturer (2017)  
Commitment to Research Award (2016, 2017)  
Benedictine University Leadership Award (May 2015)  
Benedictine University Honors Society Award (May 2015)

## **PUBLICATIONS**

McDaid J.; **Mustaly-Kalimi S.**; Stutzmann, GE. Ca<sup>2+</sup> dyshomeostasis disrupts cellular and synaptic functions in Alzheimer's disease. *Cells* **2020**. 9(12):2655. doi: 10.3390/cells9122655.

Schrank, S.; McDaid, J.; Briggs, C.A.; **Mustaly-Kalimi, S.**; Brinks, D.; Houcek, A.; Singer, O.; Bottero, V.; Marr, R.A.; Stutzmann, G.E. Human-Induced Neurons from Presenilin 1 Mutant Patients Model Aspects of Alzheimer's Disease Pathology. *Int. J. Mol. Sci.* **2020**, *21*, 1030. doi:10.3390/ijms21031030.

Chakroborty S, Hill ES, Christian DT, Helfrich R, Riley S, Schneider C, Kapecki N, **Mustaly-Kalimi S**, Seiler FA, Peterson DA, West AR, Vertel BM, Frost WN, Stutzmann GE. (2019). Reduced presynaptic vesicle stores mediate cellular and network plasticity defects in an early-stage mouse model of Alzheimer's disease. *Molecular Neurodegeneration*, 14(1). doi: 10.1186/s13024-019-0307-7.

**Mustaly-Kalimi S**, Littlefield Alyssa M., and Stutzmann Grace E..Antioxidants & Redox Signaling. April 2018 <http://doi.org/10.1089/ars.2017.7266>

## ORAL PRESENTATIONS

**Mustaly S.** March 2019 “V-ATPase dysfunction contribute to lysosome-autophagosome mediated proteinopathy in early stages of Alzheimer's disease pathogenesis.” All School Research Consortium (ASRC), Rosalind Franklin University of Medicine and Science, North Chicago, IL.

**Mustaly S.** March 2018. “Defects in vacuolar ATP-ase affect lysosome-autophagosome regulation and synaptic vesicles in early stages of Alzheimer's disease pathogenesis.” All School Research Consortium (ASRC), Rosalind Franklin University of Medicine and Science, North Chicago, IL.

**Mustaly S.** Beaman KD. Gilman-Sachs A. Schrank S. Marr R. Stutzmann GE. June 2020. “Lysosome-autophagosome defects mediated proteinopathy in early stages of Alzheimer's disease pathogenesis”. Brain Science Institute Symposium, Online

**Mustaly S.,** Gilman-sachs A., Marr R., Peterson D., Beaman KD., Stutzmann G. March 2021. “Lysosome-autophagosome defects mediate proteinopathy in Alzheimer’s disease pathogenesis.” Society for Neuroscience Chicago Chapter. Chicago, IL, Online.

## POSTER PRESENTATIONS

Mustaly S. Gilman-Sachs A. Marr R. Peterson D. Beaman KD. Stutzmann GE. June 2022. “ER calcium signaling dysregulation disrupts lysosomal-autophagosomal proteolysis in Alzheimer’s disease”. Gordon Conference: Calcium, Santa Barbra, CA.

Mustaly S. Gilman-Sachs A. Marr R. Peterson D. Beaman KD. Stutzmann GE. October 2021. “Lysosome-autophagosome defects mediated proteinopathy in early stages of Alzheimer's disease pathogenesis”. Society for Neuroscience (SfN), Chicago, IL.

Mustaly S. Beaman KD. Gilman-Sachs A. Marr R. Stutzmann GE. March 2021. “Lysosome-autophagosome defects mediated proteinopathy in early stages of Alzheimer's disease pathogenesis”. All School Research Consortium (ASRC), Rosalind Franklin University of Medicine and Science, North Chicago, IL.

Mustaly S. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. Stutzmann GE. June 2020. “Lysosome-autophagosome defects mediated proteinopathy in early stages of Alzheimer's disease pathogenesis”. Alzheimer’s Association International Conference, Online

Mustaly S. Schrank S. Chakroborty S. McDaid J. Marr R. Stutzmann GE. 18-20 September 2019. “Calcium Signaling deficits in early Alzheimer’s disease pathophysiology”. European Calcium Society 8<sup>th</sup> Workshop. Calcium Signaling in Aging and Neurodegenerative Diseases. Coimbra, Portugal.

Mustaly S. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. Stutzmann GE. October 2019. “Lysosome-autophagosome defects mediated proteinopathy in early stages of Alzheimer's disease pathogenesis”. Society for Neuroscience (SfN), Chicago, IL.

Mustaly S. Kapecki N. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. McDaid J. Stutzmann GE. March 2019. “V-ATPase dysfunction contribute to lysosome-autophagosome mediated proteinopathy in early stages of Alzheimer's disease pathogenesis”. Society for Neuroscience: Chicago Chapter (CSfN), Chicago, IL.

Mustaly S. Kapecki N. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. McDaid J. Stutzmann GE. March 2019. "V-ATPase dysfunction contribute to lysosome-autophagosome mediated proteinopathy in early stages of Alzheimer's disease pathogenesis." All School Research Consortium (ASRC), Rosalind Franklin University of Medicine and Science, North Chicago, IL.

Mustaly S. Garstka M. Kapecki N. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. McDaid J. Stutzmann GE. March 2018. "Defects in vacuolar ATP-ase affect lysosome-autophagosome regulation and synaptic vesicles in early stages of Alzheimer's disease pathogenesis." All School Research Consortium (ASRC), Rosalind Franklin University of Medicine and Science, North Chicago, IL.

Mustaly S. Garstka M. Kapecki N. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. McDaid J. Stutzmann GE. March 2018. "Defects in lysosome-autophagosome regulation and synaptic vesicles in Alzheimer's disease mouse models and human induced neurons". Society for Neuroscience: Chicago Chapter (CSfN), Chicago, IL.

Mustaly S. Garstka M. Kapecki N. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. McDaid J. Stutzmann GE. July 2018. "Lysosome-autophagosome defects mediate proteinopathy and synaptic pathophysiology in early stages of Alzheimer's disease". Alzheimer's Association International Conference (AAIC), Chicago, IL.

Mustaly S. Garstka M. Kapecki N. Beaman KD. Gilman-Sachs A. Schrank S. Marr R. McDaid J. Stutzmann GE. November 2018. "V-ATPase dysfunctions contribute to lysosome-autophagosome mediated proteinopathy and synaptic pathophysiology in early stages of Alzheimer's disease pathogenesis". Society for Neuroscience (SfN), San Diego, CA.

Mustaly S. Garstka M. Kapecki N. Beaman KD. Gilman-Sachs A. Stutzmann GE. November 2017. "Defects in vacuolar ATP-ase affect lysosome-autophagosome regulation and synaptic vesicles in early stages of Alzheimer's disease". Society for Neuroscience (SfN), Washington D.C.

Mustaly S, Partyka K, Zulqarnain M, McCarthy RC. April 2014. Variation in Human Vowel Production. ACCA Student Symposium. Concordia University, Chicago, IL.

Ronkainen NJ, Olson N, and Mustaly S. March 2015. Mineral and trace element analysis of berry liquors from Northern Europe. 249th ACS National Meeting & Exposition. Denver, CO

## **ADVOCATES & VOLUNTEER**

March for Science Participant (2017-2018)

Middle School Neuroscience Presentation (2017)

## **LANGUAGES**

English –*Native*: Gujarati –*Fluent*: Spanish –*Intermediate*: Arabic –*Basic*: Hindi –*Basic*