

Gustavo M. Silva, PhD

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Curriculum vitae

A. EDUCATION AND EMPLOYMENT

Duke University	– USA	Assistant Professor	Biology	2017 - present
New York University	– USA	Facility Manager	Proteomics	2014 - 2017
New York University	– USA	Post-doctoral fellow	Proteomics	2011 - 2017
University of São Paulo	– Brazil	Ph.D.	Genetics/Biochemistry	2005 - 2010
University of São Paulo	– Brazil	Lic.	Biology Licentiate	2003 - 2007
University of São Paulo	– Brazil	B.Sc.	Biology	2000 - 2004

B. FELLOWSHIPS AND AWARDS

1. 100 Black Inspiring Scientists (Cell Press), 2020
2. NIH Early Career Reviewer Program – MBPP Study Section, 2020
3. Duke Nominee for Packard Fellowship, 2019
4. Duke Nominee for Searle Scholars Program, 2018
5. Faculty Development grant award – Duke Provost Office, 2018
6. National Institutes of Health **K99/R00 Award**, 2015
7. Faculty of 1000 Research Prize – NYU Points Symposium, 2015
8. NYU Representative for Blavatnik Regional Award, 2014, 2017
9. **Scholarship for Yeast Genetics Course** - Cold Spring Harbor Laboratory, 2014
10. **Butantan Foundation Prize** – 2nd Best Paper of the Year (Silva et al., 2012), 2012
11. **Scholarship for Proteomics Course** - Cold Spring Harbor Laboratory, 2011
12. **Travel Award for VI Meeting of Society for Free Radical Biology and Medicine** – South American Group. Santiago, Chile, 2009
13. **Travel Award for V Meeting of Society for Free Radical Biology and Medicine** – South American Group. Montevideo, Uruguay, 2007
14. **Young Investigator Award**, Butantan Institute Annual Meeting (2nd Place). São Paulo, Brazil, 2006
15. **SBBq Award**, Brazilian Association of Biochemistry and Mol. Biology. Águas de Lindóia, Brazil, 2005
16. **PhD fellowship** by the Sao Paulo Research Foundation (FAPESP), 2005
17. **Undergraduate fellowship** by the National Council for Scientific and Technological Development (CNPq), 2001

C. RESEARCH SUPPORT

Active:

- Principal Investigator, **R35 MIRA** (Maximizing Investigator's Research Award). GM137954 National Institute of General Medical Sciences (NIGMS) - Dissecting the roles of ubiquitin in translation control (2020-2025)
- Principal Investigator, **K99/R00** Pathway to Independence Award, ES025835, National Institute of Environmental Health Sciences (NIEHS) - Defining the roles of ubiquitination during the environmental stress response (2015-2021)
 - + Administrative Supplement to Promote Diversity in Health-Related Research ES025835-03S1
- Contributor/Mentor, **UE5** (Cooperative Agreement to support MOSAIC). UE5GM139192-01 The ASBMB MOSAIC Program: Maximizing Success Of K99/R00 Diversity Scholars In Academic Careers At Research Intensive Institutions (2020-2025)

Completed:

- Key personnel: R43 Small Business Innovation Research (**SBIR**), AG054313, National Institutes of Health (NIA) - Linkage-specific ubiquitylation patterns as highly sensitive markers for neurodegenerative diseases, 2016-2017 (PI: Butt, Co-I: Vogel)
- Key personnel: National Science Foundation **EAGER** award F7467 – MCB-1355462 – Modeling Protein Degradation - Evaluation of Strategies and Targets, 2013 – 2015. (PI: Vogel, Co-I: Sasha)

D. PUBLICATIONS (reverse chronological order)

*co-corresponding author, #equally contributing author

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1. Zhou, Y.E., Kastritis, P.L.*, Dougherty, S.E., Bouvette, J., Hsu, A., Burbaum, L., Mosalaganti, S., Pfeffer, S., Hagen, W.J.H., Förster, F., Borgnia, M., Vogel, C., Beck, M., Bartesaghi, A.* and **Silva, G.M.***. [Structural impact of K63 ubiquitin on yeast translocating ribosomes under oxidative stress](#). *Proc Natl Acad Sci U S A* (2020), doi: 10.1073/pnas.2005301117
Recognition:
 1) Press release: [Duke Biochemistry](#)
 2. Blount, J.R., Libohova, K., **Silva, G.M.**, and Todi, S.V. [Isoleucine 44 hydrophobic patch controls toxicity of unanchored, linear ubiquitin chains through NF-κB signaling](#). *Cells* (2020) doi: 10.3390/cells9061519
 3. Dougherty, S.E., Maduka, A.O., Inada, T, and **Silva, G.M.** [Expanding Role of Ubiquitin in Translational Control](#). *Int J Mol Sci* (2020) **21**: pii: E1151 doi: 10.3390/ijms21031151.
 4. Manohar, S., Jacob, S., Wang, J., Wiechecki, K., Koh, H., Simoes, V., Choi, H., Vogel, C., and **Silva, G.M.** [Polyubiquitin chains linked by lysine residue 48 \(K48\) selectively target oxidized proteins in vivo](#) *Antioxid Redox Signal* (2019) **31**: 1133-49 doi:10.1089/ars.2019.7826
 5. Back, S., Gorman, A., Vogel, C., and **Silva, G.M.** [Site-specific K63 ubiquitinomics reveals post-initiation regulation of ribosomes under oxidative stress](#) *Journal of Proteome Research* 2019 **18**: 309-318 doi: 10.1021/acs.jproteome.8b00623

Recognition:

- 1) [preLights](#) - PrePrint Highlights
6. Wiechecki, K., Manohar, S., **Silva, G.M.**, Tchourine, K., Jacob, S., Valleriani, A. and., Vogel, C. [Integrative meta-analysis reveals that most yeast proteins are very stable](#). *pre-print at bioRxiv* doi:10.1101/165290
 7. Lin, Y., Sekedat, M., Cornell, W., **Silva, G.M.**, Okegbe, C., Price-Whelan, A., Vogel., C. Dietrich, L.E.P. [Phenazines regulate Nap-dependent denitrification in *Pseudomonas aeruginosa* biofilms](#) *J. Bacteriol* (2018) doi: 10.1128/JB.00031-18
Recognition:
 - 1) [Editor's pick](#)
 - 2) [Cover photo](#)
 8. **Silva, G.M.**, and Vogel, C. [Quantifying gene expression: the importance of being subtle](#). *Molecular Systems Biology* (2016) doi: 10.15252/msb.20167325.
 9. Da Costa, J., Vitorino, R.; **Silva, G.M.**, Vogel, C., Duarte, A.C., Rocha-Santos, T. [A synopsis on Aging – theory, mechanisms and future prospects](#) *Ageing Research Reviews* 2016, **29**:90-112, doi: 10.1016/j.arr.2016.06.005,
 10. Toledo, R.A, Qin, Y., Cheng, Z.M., Gao, Q., Iwata, S., **Silva, G.M.**, Prasad, M.L., Ocal, T., Rao, S., Aronin, N., Barontini, M., Bruder, J, Reddick, R. Chen, Y., Aguiar, R.C.T. and Dahia, P.L.M. [Recurrent mutations of chromatin remodeling genes and kinase receptors in pheochromocytomas and paragangliomas](#) *Clinical Cancer Research* 2016, **22**:2301-2310 doi: 10.1158/1078-0432
 11. **Silva, G.M.**,* Wei, W., Manohar, S. and Vogel, C. [Identification and quantification of K63-ubiquitinated proteins in neuronal cells by high-resolution mass spectrometry](#). *NeuroMethods* (2015) Humana Press – Springer Science, NY, doi: 10.1007/7657_2015_95
 12. **Silva, G.M.*** and Vogel, C. [Mass spectrometry analysis of K63-ubiquitinated targets in response to oxidative stress](#). *Data in Brief* 2015, **4**:130-134. doi: 10.1016/j.dib.2015.05.002
 13. **Silva, G.M.**,* Finley, D. and Vogel, C. [K63 ubiquitination is a new modulator of the oxidative stress response](#). *Nature Structural & Molecular Biology* 2015, **22**:116-123. doi:10.1038/nsmb.2955
Recognition:
 - 1) [NYU Research News](#),
 - 2) [Agencia FAPESP press release – Brazil](#)
 - 3) [Redoxoma Newsletter](#)
 - 4) [ScienceDaily](#)
 - 5) [Phys.org](#)
 14. Tchourine, K., Poultney, C., Wang, L., **Silva, G.M.**, Manohar, S., Mueller, C.L. Bonneau, R. and Vogel, C. [One third of dynamic gene expression profiles can be predicted by simple rate equations](#). *Mol BioSyst* 2014 **10**(11):2850-2862. PubMed PMID: 25111754 10.1039/c4mb00358f.
 15. Demasi, M., Netto L.E., **Silva, G.M.**, Hand, A., de Oliveira, C.L., Bicev, R.N., Gozzo, F. Barros, M.H., Leme, J.M., Ohara, E. [Redox regulation of the proteasome via S-glutathionylation](#). *Redox Biol.* 2013 **2**:44-51. PubMed PMID: 24396728 doi: 10.1016/j.redox.2013.12.003
 16. Malvezzi, A., Higa, P.M., Amaral, A.T., **Silva, G.M.**, Gozzo, F.C., Ferro, E.S., Castro, L.M., de Rezende, L., Monteiro, G., and Demasi, M. [The Cysteine-Rich Protein Thimet Oligopeptidase as](#)

- [a Model of the Structural Requirements for S-glutathiolation and Oxidative Oligomerization](#). *PLoS One* 2012 **7**(6):e39408. PubMed PMID: 22761783 doi: 10.1371/journal.pone.0039408
17. **Silva, G.M.**, Netto, L.E., Simoes, V., Santos, L.F., Gozzo, F.C., Demasi, M.A., Oliveira, C.L., Bicev, R.N., Klitzke, C.F., Sogayar, M.C. and Demasi, M. [Redox Control of 20S Proteasome Gating](#). *Antioxid Redox Signal* 2012 **16** (11):1183-1194. PubMed PMID: 22229461 doi:10.1089/ars.2011.4210
Recognition:
 - 1) [Journal issue cover page](#),
 - 2) [Agencia FAPESP press release](#)
 - 3) [INCT Redoxoma News](#) (Brazil)
 18. Vogel, C., **Silva, G.M.**, and Marcotte, E.M. [Protein expression regulation under oxidative stress](#). *Mol Cell Proteomics* 2011 **10**(12):M111.009217. PubMed PMID: 21933953 doi: 10.1074/mcp.M111.009217
 19. **Silva, G.M.**, Netto, L.E., Discola, K.F., Piassa-Filho, G.M., Pimenta, D.C., Barcena, J.A., and Demasi, M. [Role of glutaredoxin 2 and cytosolic thioredoxins in cysteinyl-based redox modification of the 20S proteasome](#). *FEBS J* 2008 **275**: 2942-2955. PubMed PMID: 18435761 doi:10.1111/j.1742-4658.2008.06441.x
 20. Netto, L.E., de Oliveira, M.A., Monteiro, G., Demasi, A.P., Cussioli, J.R., Discola, K.F., Demasi, M., **Silva, G.M.**, Alves, S.V., Faria, V.G., *et al.* [Reactive cysteine in proteins: protein folding, antioxidant defense, redox signaling and more](#). *Comp Biochem Physiol C Toxicol Pharmacol* 2007 **146**:180-193. PubMed PMID:17045551 doi:10.1016/j.cbpc.2006.07.014
 21. Discola, K.F., Oliveira, M.A., **Silva, G.M.**, Barcena, J.A., Porras, P., Padilla, A., Netto, L.E., and Guimaraes, B.G. [Crystallization and preliminary X-ray crystallographic studies of glutaredoxin 2 from *Saccharomyces cerevisiae* in different oxidation states](#). *Acta Crystallogr Sect F Struct Biol Cryst Commun* 2005 **61**:445-447. PubMed PMID: 16511065
 22. Demasi, M., **Silva, G.M.**, and Netto, L.E. [20 S proteasome from *Saccharomyces cerevisiae* is responsive to redox modifications and is S-glutathionylated](#). *J Biol Chem* 2003 **278**:679-685. PubMed PMID:12409293 doi:10.1074/jbc.M209282200

E. TEACHING EXPERIENCE

1. Gateway to Molecular Biology (Duke - BIO201), 2019 – present
2. Research in Genetics and Genomics (Duke - UPGEN716), 2018 – present
3. Guest Lecturer for Systems Biology Graduate Course (NYU - BIOL-GA 1128), 2012- 2016
4. Guest Lecturer for Molecular Bases of the Cellular Function at USP (BIO0511), 2010
5. Teaching Internship at Public Schools in Brazil (EE Capitaó Pedro M. do Amaral and EMEF Queiroz Filho) 300h, 2004-2007

F. MENTORING (current/total)

- **High School Students** (0/4): Ms Sophia Zhang (Cornell University), Ms. Gabi Rutherford (Macalester College), Ms. Olena Nazarenko, Ms. Raima Shafiq,
- **Undergraduate Students** (2/10): Ms. Emma Bucklan, Ms. M. Sapphire Bowen-Kauth, Ms. Julia Marshall, Ms. Valeria Santa-Melendez, Ms Sandhya Manohar (PhD candidate at Harvard), Ms.

- Aditi Vyas, Mr. Joseph Chin (VA Northern California Health Care System), Ms. Daniele Silva, Ms. Vanessa Simoes, Ms. Felicia Cavalher
- **Master's students** (0/3): Mr Samson Jacob (Data scientist at NYU Medical School), Ms. Ana Galesic (PhD student at USC), Ms. Tayebah Bahmani (at Bristol-Myers Squibb).
 - **Lab Technicians** (3/6): Ms. Vanessa Simoes (MSc.), Ms. Wei Wei, (PhD student at NYU Medical School), Ms. Songhee Back (PhD student at Mount Sinai), Ms. Patricia Moraes, Mr. Adrian Hand, Mr. Angelino Felicio,
 - **PhD students** (2/2): Ms. Shannon Dougherty, Mr. Austin Maduka
 - **Postdoctoral fellows** (1/3): Dr. Andrew Gorman, Dr. Nate Snyder, Dr. Brian Gregory.
 - **PhD Committee** (4/5): Marcela Pimenta (University of Sao Paulo, Souza lab 2018), Jimin Hu (Duke University, Boyce Lab 2018), Daltry Snider (Duke University, Horner Lab, 2019), Peter Park (Duke University, Sherwood Lab 2019), Ran Ming (Duke University, Scaglione Lab, 2019).

G. INVITED TALKS

1. University of Washington, Dept of Biochemistry Seminar, *scheduled May2021*
2. Stanford University, Chemical Biology Seminar Series, *scheduled May2021*
3. Stanford Frontiers in Biology Special Series, (**students and postdocs nomination**), *scheduled Mar2021*
4. Emory University, Dept of Cell Biology, *scheduled Dec2020*
5. NIEHS, Signal Transduction Lab, *scheduled Dec2020*
6. ABRCMS (Annual Biomedical Research Conference for Minority Students), *scheduled Nov2020*
7. UCSF Biochemistry and Biophysics, *schedule Nov2020*
8. Johns Hopkins, Dept of Biochem and Molecular Biology, *scheduled Oct2020*
9. Wesleyan University, Dept Molecular Biology and Biochemistry, *scheduled Oct2020*
10. Duke, Molecular Genetics & Microbiology (MGM) retreat, **closing speaker**, 2020
11. Federal University of Rio de Janeiro (URFJ), Knowledge Fest, 2020
12. New York University, Biology (Summer Undergraduate Research Program) 2020
13. ASBMB - Career Development Day – ASBMB (canceled Covid19) 2020
14. FASEB Research Conference, Ubiquitin conference (canceled Covid19), 2020
15. North Carolina State University, Toxicology, 2019
16. North Carolina RNA Society Symposium, 2019
17. New York University, Biology (Summer Undergraduate Research Program), 2019
18. Winston-Salem State University; **Keynote** for Cultural Neuroscience Summer Institute, 2019
19. UNC at Chapel Hill, Pharmacology (**Closing series, Students Nomination**), 2019
20. Federal University of Sao Paulo, Pharmacology (Brazil), 2019
21. New York University Langone School of Medicine (**Marie M. Daly Inaugural lecturer**), 2018
22. Duke, University Program in Genetics and Genomics Retreat, 2018
23. 16th Discovery on Target Conference, Cambridge HealthTech Institute, 2018
24. Duke IMSD BioCoRe annual retreat, 2018
25. Duke, Educate to Liberate, Franklin Humanities Center, 2018
26. Vanderbilt University (Emerging Scholars Series), 2018
27. Meharry Medical College, 2018
28. Duke, **Keynote** Speaker Bouchet Society Black Tie Dinner, 2018
29. LifeSensor, Inc, 2017
30. New York University, Postdoctoral Research Showcase, (**Department nominee**), 2017
31. University of Sao Paulo (Brazil), Redoxoma Series, 2016

H. SERVICE

Professional service

- Board of Reviewing Editors, eLife (2020-present)
- NIH ECR Grant Reviewer – MBPP Study Section (2020)
- NIEHS Science Days judge (2018-present)
- Grant reviewer for Israeli Science Foundation, NIH-EXITO program, Polish National Science Center
- Ad hoc reviewer for Nature Biotech, Nature Structure & Molecular Biology, Nucleic Acid Research, Cell Reports, Trends in Biotechnology, Journal of International Molecular Sciences, Cells, Cellular and Molecular Life Sciences
- Professional Affiliation (American Society for Biochemistry and Molecular Biology, 2017-present)

University & Departmental service

- Reginaldo Howard Memorial Scholars Program Selection Committee, Duke (2019-present)
- Martin Luther King Week Committee, Duke University (2018-present)
- Department of Biology Steering Committee (2020)
- Duke Brazil Initiative, council member

Diversity and Inclusion

- The Black Think Tank (*Role*: Founder and co-PI) – Grant funded by the Provost Office for Faculty Advancement at Duke University. Develop an institutional platform to foster an inclusive academic community to support the advancement of Black Faculty through resources and multidisciplinary research projects. 2018-present
- Ambassador for ABRCMS (Annual Biomedical Conference for Minority Students, 2018-present)
- Member of Minority Affairs Committee at American Society for Biochemistry and Molecular Biology (ASBMB). 2018-2021
- Recruiter and Poster/Oral Judge at ABRCMS (Annual Biomedical Conference for Minority Students). NYU 2016, Duke 2017-2018.
- Assistant Coordinator and lecturer for NYU Biology Summer Undergraduate Research Program (SURP) for diversity in science, 2016 and 2017
- Mentor/host for NYU Poly ARISE High School Program (Applied Research Innovations in Science and Engineering) – for talented high-school students from underrepresented groups, 2014 and 2015

I. CONFERENCE PRESENTATIONS

1. Translational Control, Cold Spring Harbor, NY, USA, Oral presentation, 2020
2. The Ubiquitin Family, Cold Spring Harbor, NY, USA, Oral presentation, 2017
3. EMBO Ubiquitin and Ubiquitin-like modifiers, Cavtat, Croatia, 2015
4. 1st NYU PolInts Postdoctoral Interdisciplinary Symposium. New York, NY, USA Prize Awardee, 2015
5. The 4th International Forum of Proteomics (IFP) and the Conference of Proteomics of protein degradation and ubiquitin pathways (PPDUP), San Diego, CA, USA, 2012
6. 16th Society for Free Radical Biology and Medicine Annual Meeting (SFRBM), San Francisco, CA, USA, 2009

7. VI Meeting of SFRBM - South American Group, Santiago, Chile. Travel Scholarship Awardee, 2009
8. XXXVIII SBBq Annual Meeting (Biochemistry and Molecular Biology Brazilian Society), Águas de Lindóia, SP, Brazil, 2009
9. 33rd FEBS Congress and 11th IUBMB Conference, Athens, Greece, 2008
10. XXXVII SBBq Annual Meeting, Águas de Lindóia, SP, Brazil, 2008
11. V Meeting of SFRBM - South American Group, Montevideo, Uruguay. Travel Scholarship Awardee, 2007
12. XXXVI SBBq Annual Meeting, Salvador, BA, Brazil, 2007
13. XXXV SBBq Annual Meeting, Águas de Lindóia, SP, Brazil, 2006
14. VIII Butantan Institute Scientific Meeting, São Paulo, SP, Brazil. Oral Presentation. Young Investigator Prize Awardee, 2006
15. XXXIV SBBq Annual Meeting, Águas de Lindóia, SP, Brazil. SBBq Prize Awardee, 2005
16. XXXII SBBq Annual Meeting, Caxambu, MG, Brazil, 2003

J. MEDIA

1. **Article on UOL Ecoa** – <https://www.uol.com.br/ecoa/reportagens-especiais/cientistas-que-deixaram-o-pais-refletem-sobre-a-carreira-no-exterior-e-o-futuro-do-brasil> 2020
2. **Discussion panel** for Dialogos Contemporaneos with Brazil's House Minority Leader Jandira Feghali (Federal Institute of Bahia/IFBA) – <https://www.youtube.com/watch?v=RDqlxjqbsU>, 2020
3. **Interview to AfroKuara Channel** - <https://www.youtube.com/watch?v=ee2eQVp4IIE&t=449s>, 2020
4. **Article for Alma Preta Portal** – <https://almapreta.com/editorias/realidade/biologo-explica-porque-a-populacao-negra-e-a-mais-impactada-pelo-coronavirus-no-brasil-e-nos-eua>, 2020
5. Journal of Cell Biology – **People & Ideas** - <http://jcb.rupress.org/content/218/1/3>, 2019
6. Duke Today - <https://today.duke.edu/2019/05/junior-faculty-students-launch-black-think-tank>, 2019
7. ASBMB Today – **Faculty Profile** <http://www.asbmb.org/asbmbtoday/201808/Perspective/Silva/> 2018
8. Duke Today – **Faculty Profile** <https://today.duke.edu/2017/11/gustavo-monteiro-silva-brazil-taking-crucial-challenge-cell-biology>, 2017
9. The Chronicle - <http://www.dukechronicle.com/article/2017/11/from-a-doctor-turned-mathematician-to-an-art-historian-teaching-politics-meet-some-of-dukes-newest-faculty> 2017

K. RELEVANT COURSES

1. Selected for Duke LEADER program (Leadership Development for Researchers), 2020
2. Faculty Success Program (National Center for Faculty Development and Diversity), 2018
3. NYU Communication, Leadership and Conflict Resolution, 2015
4. ASBMB Grant Writing and Mentoring Workshop, Washington DC, USA, 2015
5. NYU High Throughput Sequencing – Bioinformatics Workshop, 2015
6. Yeast Genetics/ Genomics Intensive Course, Cold Spring Harbor Laboratory, USA, 2014
7. Proteomics Intensive Course, Cold Spring Harbor Laboratory, USA, 2011
8. Free Radical School at SFRBM Meeting, Santiago, Chile, 2009
9. Free Radical School at SFRBM Meeting, Montevideo, Uruguay, 2007

J. ACTIVE COLLABORATIONS

Alberto Bartesaghi, PhD (Duke University): cryo-EM 3D Structure of ribosome
Martin Beck, PhD (EMBL at Heidelberg): cryo-EM 3D Structure of ribosome
Mario Borgnia, PhD (NIEHS): cryo-EM 3D structure of ribosomes
Nicholas Brown, PhD (UNC): Molecular mechanisms of ubiquitination
Hyungwon Choi, PhD (National University of Singapore): Statistical frameworks for proteomics
Dorothy Erie, PhD (UNC): Single Molecule FRET of ribosomes
Stacy Horner, PhD (Duke University): UFMylation and viral infection
Toshifumi Inada, PhD (Tohoku University, Japan): Ribosome ubiquitination and quality control
Chris Nicchitta, PhD (Duke University): Translational Regulation
Matt Scaglione, PhD (Duke University): Ubiquitin and neuronal disorders.
Pieter Spealman, PhD (New York University): RiboSeq of cells under stress
Sokol Todi, PhD (Wayne State University): Ubiquitin impact in ataxia and cell death
Chris Vakoc, PhD (Cold Spring Harbor): CRISPR library and cancer