

# María Natalia Vergara, PhD

## CURRICULUM VITAE

### CURRENT POSITION

Assistant Professor of Ophthalmology  
Director, [Ocular Development and Translational Technologies Laboratory](#)  
*CellSight* Ocular Stem Cell and Regeneration Program  
Department of Ophthalmology | Sue Anschutz-Rodgers Eye Center  
Anschutz Medical Campus, University of Colorado School of Medicine

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### RESEARCH INTERESTS

- Understanding the mechanisms of human retina development and degeneration, with particular emphasis on age-related macular degeneration and Alzheimer's disease, as manifested in Down syndrome and in the typical population.
- Engineering stem cell-based disease models and technologies that facilitate the application of human retinal organoids to the development of novel therapeutic drugs for retinal degenerative diseases.

### EDUCATION

- 2009-2015 Post-Doctoral Fellow.  
Wilmer Eye Institute, Johns Hopkins School of Medicine, Baltimore, MD.  
Field: Stem cell and developmental biology of the eye.  
Advisor: Dr. Maria Valeria Canto-Soler.
- 2008-2009 Post-Doctoral Fellow.  
Department of Zoology, Miami University, Oxford, OH.  
Field: Regenerative biology of the eye.  
Advisor: Dr. Katia Del Rio-Tsonis.
- 2002-2008 Ph.D., Biology.  
Department of Zoology, Miami University, Oxford, OH.  
Field: Mechanisms of lens and retina regeneration.  
Advisor: Dr. Katia Del Rio-Tsonis.
- 1998 B.S., Biochemistry.  
Universidad Nacional del Litoral, Santa Fé, Argentina.

### Advanced/leadership training

- 2023 Continuous Improvement Foundations Certificate Program. University of Colorado, Aurora, CO.
- 2021 Equity Certificate Program. University of Colorado School of Medicine. Aurora, CO.
- 2018-2019 Women's Leadership Training Program. Competitive leadership program for early career women faculty. University of Colorado School of Medicine. Aurora, CO.

2017-2018 Career Cornerstones Program. Multi-departmental professional development program targeted to early career faculty. University of Colorado School of Medicine. Aurora, CO.

### **ACADEMIC APPOINTMENTS**

2017- present Assistant Professor, Sue Anschutz-Rodgers Eye Center.  
University of Colorado School of Medicine. Aurora, Co.

2015-2017 Research Associate Faculty.  
Wilmer Eye Institute, Johns Hopkins School of Medicine, Baltimore, MD.

2006-2007 Teaching Assistant.  
Department of Zoology, Miami University. Oxford, OH.

2001-2002 Adjunct Professor.  
Universidad Autónoma de Entre Ríos. Paraná, Argentina.

2001 Teaching Assistant.  
Universidad Nacional de Entre Ríos. Oro Verde, Argentina.

### **Current program affiliations**

CellSight Ocular Stem Cell and Regeneration Program, University of Colorado School of Medicine.  
Colorado Clinical and Translational Sciences Institute (CCTSI)  
Linda Crnic Institute for Down Syndrome  
Gates Institute for Regenerative Medicine  
University of Colorado Alzheimer's and Cognition Center

### **PRIOR PROFESSIONAL POSITIONS**

1999-2002 Research Assistant, Microscopy Laboratory. Universidad Nacional de Entre Ríos, Oro Verde, Argentina.

1998 Intern, Quality Control Department, LAFEDAR S.A. Pharmaceutical Company. Paraná, Argentina.

### **HONORS, SPECIAL RECOGNITIONS AND AWARDS**

2023 Travel Award, Association of Ocular Pharmacology and Therapeutics XVI biennial meeting. Indianapolis, Indiana, USA

2022 Second prize overall and winner of the “Drug screening category”, [National Eye Institute’s 3D-Retinal Organoid Challenge Award, Phase III](#). Title: “[Improved Fluorescent Reporter Quantification-Based 3D Retinal Organoid Paradigms for Drug Screening](#)”. Role: Team Leader.

2022 First prize overall and winner of the “Disease modeling category”, [National Eye Institute’s 3D-Retinal Organoid Challenge Award, Phase III](#). Title: “[3D Human Model of AMD in a dish](#)”. Role: Team Member.

2021 First prize, [3D Retinal Organoid Challenge Award from the National Eye Institute](#), NIH. Title: “Improved Fluorescent Reporter Quantification-Based 3D Retinal Organoid Paradigm for Drug Screening.” Phase II challenge. Role: Team Leader.

2020 RNA Biosciences Initiative Award. University of Colorado Anschutz Medical Campus.

- 2018 Keystone Symposia Early Career Investigator Travel Award. Keystone Symposia on Molecular and Cellular Biology, March 25—29, 2018. Olympic Valley, CA.
- 2017 Selected as an Emerging Vision Scientist by the National Alliance for Eye and Vision Research (NAEVR), to participate in the *Third Annual EVS day on Capitol Hill* science advocacy event, September 13-14, 2017, Washington D.C.
- 2008 Doctoral Student Research Award. Department of Zoology. Miami University.
- 2007 Graduate Student Achievement Award. Graduate School. Miami University.
- 2006 Doctorate-Undergraduate Research Award for mentoring an undergraduate student, Lindsay Carlin. Miami University.
- 2005 Best pre-doctoral poster award. Neuroscience Day, Ohio Miami Valley Society for Neuroscience. Title "Molecular pathways in retina regeneration"
- 2004 Travel Award to deliver an oral presentation at the Midwest Regional Meeting of the Society for Developmental Biology.
- 2004 Master's Student Research Award. Department of Zoology. Miami University.
- 2004 Doctorate-Undergraduate Research Award for mentoring an undergraduate student, Alexander Jerome. Miami University.

## MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- 2022- present International Society to Advance Alzheimer's Research and Treatment (ISTAART).
- 2022- present International Society for Eye Research (ISER).
- 2019- present Society for Neuroscience (SfN).
- 2017- 2018 Latin American Society for Developmental Biology (LASDB).
- 2006- present Association for Research in Vision and Ophthalmology (ARVO).
- 2002- 2018 Society for Developmental Biology (SDB).

## INVITED LECTURES/ PRESENTATIONS

### International

1. Invited speaker, 11th World Congress of Neuroscience, International Brain Research Organization (IBRO). Title: "What can stem cell-derived retinal organoids teach us about development?" Granada, Spain. 9-13 September, 2023
2. Keynote Speaker: "Looking into the future: The promise of stem cells to restore vision in patients with retinal degenerations". M. Natalia Vergara and Andres Lisker. Vision 2023 Conference. Denver, CO, USA. July 24-27, 2023
3. Invited speaker, XXV Biennial Meeting of the International Society for Eye Research (ISER). Title: "Application of retinal organoids to drug development: lessons learned." Gold Coast, Queensland, Australia. February 20<sup>th</sup>, 2023.
4. Invited Speaker, *Expertise* Course, Sociedad Argentina de Oftalmología Infantil (Argentinian Society of Pediatric Ophthalmology). Title: " Organoides de Retina Humana: Desde Estudios de Desarrollo a Innovacion Terapeutica." (Virtual) Buenos Aires, Argentina. December 21<sup>st</sup>, 2021.

5. Invited Speaker, Alberta Vision Net Seminar Series, Faculty of Medicine and Dentistry, University of Alberta. Title: "Stem cell-derived retinal organoids: from human development to therapeutic innovation." Alberta, Canada. December 2<sup>nd</sup>, 2020.
6. Invited speaker, EYES 2020 Retinal Development Conference. Title: "Modeling human retina development with stem cell-derived organoids: a new look at old questions." August 18<sup>th</sup>, 2020.
7. Special guest, "Brain and Retina Organoids" Social organized by the National Eye Institute. Society for Neuroscience Annual Meeting. Chicago, IL. October 20<sup>th</sup>, 2019.
8. Invited Speaker, 23<sup>rd</sup> Annual Meeting of the Japanese Zoological Society. Title: "Mechanisms of retina regeneration." Tsukuba, Japan. October 4<sup>th</sup>, 2005.
9. Invited Speaker, series of seminars presented at Universidad Nacional de Buenos Aires (UBA), del Universidad Nacional del Litoral (UNL) and Universidad Nacional de Entre Ríos (UNER). Title: "Mecanismos de regeneración de tejidos oculares" (Mechanisms of regeneration of ocular tissues). Argentina. May-June, 2005.

### **National/ Regional**

1. Invited speaker, Association of Ocular Pharmacology and Therapeutics XVI biennial meeting. Vergara, M.N.\*, Howell, H.C., Parween, S. "Optimization of retinal organoids technologies for drug development applications." Indianapolis, Indiana, USA. August 10-13, 2023.
2. Invited speaker, 15th Annual Midwest Eye Research Symposium (MERS). Title: "Modeling Alzheimer's disease retinopathy with human iPSC-derived retinal organoids." Iowa City, IA. August 4<sup>th</sup>, 2023.
3. Invited Speaker, Diversity Seminar, SACNAS and Minority Student and Faculty Organizations. Title: "Navigating the academic journey as a minority: thoughts, experiences and lessons learned." Miami University. Oxford, OH. March 30<sup>th</sup>, 2023.
4. Invited Speaker, Department of Biology Seminar Series. Title: "Stem cell-derived retinal organoids: from developmental insights to therapeutic promise." Miami University. Oxford, OH. March 30<sup>th</sup>, 2023.
5. Invited speaker, National Eye Institute's Retinal Disease Interest Group Seminar Series. Title: "Retinal organoids: Transforming the drug development pipeline." National Eye Institute, NIH. Bethesda, Maryland. September 20<sup>th</sup>, 2022.
6. Invited Speaker, Department of Ophthalmology Seminar Series. Title: "Stem cell-derived retinal organoids: from human development to therapeutic innovation." Indiana University School of Medicine. Indianapolis, IN. September 23<sup>rd</sup>, 2021.
7. Invited Speaker, Diversity in Stem Lecture Series. Title: "Breaking through the glass ceiling: Practical tips for a career in science." University of Rochester. Rochester, NY. April 19<sup>th</sup>, 2021.
8. Invited Speaker, Department of Neuroscience Seminar Series. Title: "Stem cell-derived retinal organoids: from human development to regenerative therapies." University of Rochester. Rochester, NY. April 19<sup>th</sup>, 2021.
9. Invited Speaker, Biological Sciences Department Seminar Series, University of Northern Colorado. Title: "From stem cells to 3D retinas: new opportunities in biology and medicine" Greeley, CO. October 4<sup>th</sup>, 2019.
10. Invited Speaker, Integrated Biosciences Seminar Series, University of Akron. Title: "3D retinal organoids: from human development to regenerative therapy." Akron, OH. March 1<sup>st</sup>, 2019.

11. Invited Speaker, Identifying Treatments for Taste and Smell Disorders Conference (ITTSD). Title: "3D retinal organoids: new frontiers for regenerative therapies in the eye." Philadelphia, PA. November 14<sup>th</sup>, 2018.

### **Local**

1. Invited Speaker, Masters in Modern Human Anatomy Seminar Series, University of Colorado Anschutz Medical Campus. Title: "Modeling the Down syndrome retina with stem cells." Aurora, CO. March 9<sup>th</sup>, 2023.
2. Invited Speaker, Masters in Modern Human Anatomy Seminar Series, University of Colorado Anschutz Medical Campus. Title: "Exploring Alzheimer's disease in the retina" Aurora, CO. March 17<sup>th</sup> 2022.
3. Invited speaker, Gates Summer Internship Program, University of Colorado Anschutz Medical Campus. Title: "Using stem cell-derived retinal organoids for therapeutic development." Aurora, CO. June 8<sup>th</sup>, 2021.
4. Invited Speaker, Gates Center for Regenerative Medicine Seminar Series. University of Colorado Anschutz Medical Campus. Title: "Harnessing the potential of stem cell-derived retinal organoids for therapeutic development" Aurora, CO. March 23<sup>rd</sup>, 2021.
5. Invited Speaker, Masters in Modern Human Anatomy Seminar Series, University of Colorado Anschutz Medical Campus. Title: "Using stem cells to model human retina development: challenges and opportunities" Aurora, CO. March 11<sup>th</sup> 2021.
6. Invited Speaker, Masters in Human Anatomy Seminar Series, University of Colorado Anschutz Medical Campus. Title: "What can stem cell-derived retinal organoids teach us about development?" Aurora, CO. March 20<sup>th</sup>, 2020.
7. Invited Speaker, Molecular and Cellular Neurology Meeting, University of Colorado, Anschutz Medical Campus. Title: "Down syndrome, Alzheimer's disease and the retina: an organoid approach." Aurora, CO. November 21<sup>st</sup>, 2019.
8. Invited Speaker, Linda Crnic Institute for Down Syndrome Supergrup Meeting, Anschutz Medical Campus. Title: "Exploring the retinal manifestations of Down syndrome: A retinal organoid approach." Aurora, CO. August 21<sup>st</sup>, 2019.
9. Invited Speaker, Masters in Human Anatomy Seminar Series, University of Colorado Anschutz Medical Campus. Title: "Stem cell-derived human retinas: challenging developmental paradigms" Aurora, CO. March 14<sup>th</sup>, 2019.
10. Invited Speaker, 30th Annual Medicine & Science Symposium of the Colorado-Wyoming Junior Academy of Science. Title: "Harnessing the potential of stem cells for the treatment of blinding diseases." Aurora, CO. November 14<sup>th</sup>, 2017.
11. Invited Speaker, Vision Research Seminar Series, Department of Ophthalmology, University of Colorado School of Medicine. Title: "Stem cell-derived retinal organoids: From human development to drug discovery." Aurora, CO. April 28<sup>th</sup>, 2017.

### **Session Organizer/Moderator**

1. Session Chair and Moderator, "Young Investigator Session I." Association of Ocular Pharmacology and Therapeutics XVI biennial meeting. Indianapolis, Indiana, USA. August 10-13, 2023.
2. Session Chair and Moderator, "Platform Session II." 15th Annual Midwest Eye Research Symposium (MERS). Iowa City, IA. August 4th, 2023.

3. Session Chair and Moderator: “Human stem cell derived retinal tissues for therapeutic development”. XXV Biennial Meeting of the International Society for Eye Research (ISER). Gold Coast, Queensland, Australia. February 22<sup>nd</sup>, 2023.
4. Workshop session organizer: “Overcoming the Challenges in International Eye Research Collaborations.” ARVO 2019 Annual meeting. Vancouver, Canada. April 30<sup>th</sup>, 2019.
5. Workshop session organizer and moderator: “Civic and community engagement for stronger science: Effective communication strategies.” ARVO 2018 Annual meeting. Honolulu, HI. April 30<sup>th</sup>, 2018.

## BIBLIOGRAPHY

### Publications in Peer-Reviewed Journals (\* corresponding author)

1. James E, Vielle A, Cusato K, Li H, Lee B, Parween S, Howell A, Johnson NR, Chial HJ, Potter H and **Vergara MN\*** (2024) Human iPSC-derived retinal organoids develop robust Alzheimer’s disease neuropathology. Front. Cell. Neurosci. 18:1340448. doi: 10.3389/fncel.2024.1340448
2. Onyak, J., **Vergara, M.N.\***, and Renna, J.M.\* (2022) Retinal Organoid Light Responsivity: Current status and future opportunities. Translational Research Dec; 250:98-111. doi: 10.1016/j.trsl.2022.06.001. Epub 2022 Jun 9. PMID: 35690342.
3. Vielle, A., Park, Y.K., Secora, C., and **Vergara, M.N.\*** (2021). Organoids for the Study of Retinal Development and Developmental Abnormalities. Research Topic "Stem Cell-Derived Retinal and Brain Organoid Culture for Disease Modeling." Front Cell Neurosci. May 5;15:667880. doi: 10.3389/fncel.2021.667880. PMID: 34025363; PMCID: PMC8131530.
4. Mainland, J.D., Barlow, L., Munger, S., Millar, S., Cheng, A., **Vergara, M.N.**, Jiang, P., Schwob, J., Goldstein, B., Holt, J., Boye, S., Martens, J., Leopold, D., Bartoshuk, L., Doty, R., Hummel, T., Pinto, J., Trimmer, C., Kelly, C., Pribitkin, E., and Reed, D.R. (2020). Identifying treatments for taste and smell disorders: gaps and opportunities. Chem Senses. Jun 18:bjaa038. doi: 10.1093/chemse/bjaa038. PMID: 32556127.
5. Aasen, D.M. and **Vergara, M.N.\*** (2019). New drug discovery paradigms for retinal diseases. Journal of Ocular Pharmacology and Therapeutics, Special issue on “Next Generation Tissue Engineering - Inspired Models for Ophthalmic Drug Discovery.” May 6. doi:10.1089/jop.2018.0140. PMID: 31059378.
6. **Vergara, M.N.\***, Tsissios, G., and Del Rio-Tsonis, K.\* (2018). Lens regeneration: a historical perspective. Int. J. Dev. Biol. Special issue on Regeneration. 62(6-7-8):351-361, doi: 10.1387/ijdb.180084nv. PMID: 29877565.
7. **Vergara, M.N.\***, Flores-Bellver, M., Aparicio-Domingo, S., McNally, M.M., Wahlin, K.J., Saxena, M.T., Mumm, J.S., and Canto-Soler, M.V.\* (2017). Three-dimensional automated reporter quantification (3D-ARQ) technology enables quantitative screening in retinal organoids. Development 144(20):3698-3705. PMID: 28870990.
8. Canto-Soler, M.V., Flores-Bellver, M., **Vergara, M.N.** (2016). Stem cell sources and their potential for the treatment of retinal degenerations. Investigative Ophthalmology & Visual Science 57:ORSF1-9. PMID: 27116661. *Ranked in the 85th percentile of tracked articles of similar age and source.*
9. **Vergara, M.N.**, Gutierrez, C., and Canto-Soler, M.V. (2015). Efficient Gene Transfer in Chick Retinas for Primary Cell Culture Studies: an Ex-ovo Electroporation Approach. JoVE 105:e52002. PMID: 26556302.

10. Zhong, X., Gutierrez, C., Xue, T., Hampton, C., **Vergara, M. N.**, Cao, L. H., Peters, A., Park, T. S., Zambidis, E. T., Meyer, J. S., Gamm, D. M., Yau, K. W., and Canto-Soler, M. V. (2014). Generation of three-dimensional retinal tissue with functional photoreceptors from human iPSCs. Nature Communications 5, 4047. PMID: 24915161. *This article ranks in the 99th percentile of tracked articles of similar age in all journals, and in the 97th percentile of tracked articles of a similar age in Nature Communications. It has been highlighted among the top ten Hopkins research breakthroughs of 2014.*
11. **Vergara, M.N.**, Gutierrez, C., O'Brien, D.R., Canto-Soler, M.V. (2013). Ex vivo electroporation of retinal cells: a novel, high efficiency method for functional studies in primary retinal cultures. Experimental Eye Research 109:40-50. PMID: 23370269.
12. **Vergara, M. N.** and Canto-Soler, M.V. (2012). Rediscovering the chick embryo as a model to study retinal development. Neural Development 7: 22. PMID: 22738172. *This article has been flagged as "Highly accessed" and is ranked in the 93rd percentile of tracked articles of similar age and source.*
13. Yoshikawa, T., Mizuno, A., Yasumuro, H., Inami, W., **Vergara, M.N.**, Del Rio-Tsonis, K., Chiba, C. (2012). MEK-ERK and heparin-susceptible signaling pathways are involved in cell-cycle entry of the wound edge retinal pigment epithelium cells in the adult newt. Pigment Cell & Melanoma Research. 25(1):66-82. PMID: 22026648.
14. **Vergara, M.N.**, de la Rosa, E.J., Canto-Soler, M.V. (2012). Focus on Molecules: Proinsulin in the eye: Precursor or pioneer? Experimental Eye Research 101: 109-10. PMID: 21144848.
15. **Vergara, M.N.**, Del Rio-Tsonis, K. (2009). Retinal regeneration in the *Xenopus laevis* tadpole: a new model system. Molecular Vision 15:1000-1013. PMID: 19461929.
16. **Vergara, M.N.**, Smiley, L.K., Del Rio-Tsonis, K., Tsonis, P.A. (2009). The  $\alpha 1$  isoform of the Na<sup>+</sup>/K<sup>+</sup> ATPase is up-regulated in dedifferentiated progenitor cells that mediate lens and retina regeneration in adult newts. Experimental Eye Research 88:314-322. PMID: 18755185.
17. Casco, V.H., Izaguirre, M.F., Marín, L., **Vergara, M.N.**, Lajmanovich, R.C., Peltzer, P., Soler, A.P. (2006). Apoptotic cell death in the central nervous system of *Bufo arenarum* tadpoles induced by cypermethrin. Cell Biology and Toxicology 22: 199-211. PMID: 16570123.
18. Izaguirre, M.F., **Vergara, M.N.**, Casco, V.H. (2006). CAS role in the brain apoptosis of *Bufo arenarum* induced by Cypermethrin. Biocell 30: 309-20. PMID: 16972556.
19. Izaguirre, M.F., Marín, L., **Vergara, M.N.**, Lajmanovich, R.C.; Peltzer, P.; Casco, V.H. (2006). Anuran experimental models to study pyrethroid effects. Ciencia, Docencia y Tecnología 32: 181-206.
20. Grogg, M., Call, M.K., Okamoto, M., **Vergara, M.N.**, Del Rio-Tsonis, K., Tsonis, P.A. (2005). BMP inhibition-driven regulation of six-3 underlies induction of newt lens regeneration. Nature 438: 858-63. PMID: 16341014.
21. **Vergara, M.N.**, Arsenijevic, Y., Del Rio-Tsonis, K. (2005). CNS regeneration: a morphogen's tale. Journal of Neurobiology 64: 491-507. PMID: 16041757.
22. Tsonis, P.A., **Vergara, M.N.**, Spence, J.R., Madhavan, M.C., Kramer E.L., Call, M.K., Santiago, W.G., Vallance, J.E., Robbins, D.J., Del Rio-Tsonis, K. (2004). A Novel Role of the Hedgehog Pathway in Lens Regeneration. Developmental Biology 267: 450-461. PMID: 15013805.

#### Preprints:

1. Secora, C., Vielle, A., Wang, A.C.-J., Lenhart, P., Salcedo, E., Johnson, N.R., Ahmed, M.M., Chial, H.J., Boyd, T.D., Potter, H., and **Vergara, M.N.\*** (2021). Traumatic Brain Injury Exacerbates Alzheimer's

Disease Pathology in the Retinas of TgF344-AD Rats. bioRxiv, 2021.2009.2023.461334. doi:  
<https://doi.org/10.1101/2021.09.23.461334>.

#### Articles in preparation and under review:

1. Brooks, T., Vielle, A., Park, Y., Del Rio-Tsonis, K., Robinson, M. and **Vergara, M.N.\***. Developmental wave of programmed ganglion cell death in human retinal organoids. Submitted.
2. Howell, A.C., Park, Y., Vielle, A., Lee, B., Parween, S., Cusato, K. and **Vergara, M.N.\*** 9-cis-Retinal Supplementation Increases Yield and Accelerates Photoreceptor Maturation in Human Stem Cell-Derived Retinal Organoid Cultures. Manuscript in preparation.

#### **Book Chapters**

1. Vielle, A., Mathiyakom, N., Li, H., Howell, A.C., **Vergara, M.N.\*** (2023). Quantitative Assessment of Fluorescent Reporter Expression in 3D Retinal Organoids. In: Gopalakrishnan, J. (eds) Brain Organoid Research. Neuromethods, vol 189. Humana, New York, NY. [https://doi.org/10.1007/978-1-0716-2720-4\\_7](https://doi.org/10.1007/978-1-0716-2720-4_7).
2. **Vergara, M.N.**, Tsonis, P.A. (2013) The past, present and future of tissue regeneration. In "Regenerative Pharmacology"; Karl-Erik Andersson and George Christ editors. Cambridge University Press.
3. Henry, J.J., Wever, J.M., **Vergara, M.N.**, Fukui, L. (2008). Xenopus, an Ideal Vertebrate System for Studies of Eye Development and Regeneration. In "Animal Models for Eye Research"; Panagiotis A. Tsonis editor. Elsevier Publisher.

#### **Selected Published Abstracts and Presentations at Scientific Meetings**

##### Platform presentations

1. Speaker, Wilmer Research Meeting, Wilmer Eye Institute, Johns Hopkins University School of Medicine. Talk title: "Loss of function of the nuclear factor CTCF leads to microphthalmia and abnormal patterning of the retina." Baltimore, MD. April 15<sup>th</sup>, 2011.
2. Speaker, Neuroscience Day, Ohio Miami Valley Society for Neuroscience. Talk title: "Xenopus laevis: a new model organism for retina regeneration studies." Cincinnati, OH. April 30<sup>th</sup>, 2007.
3. Speaker, Society for Developmental Biology Mid-Atlantic Regional Meeting. Talk title: "A novel role of the Hedgehog pathway in lens regeneration." Pittsburgh, PA. May 21<sup>st</sup>, 2004.

##### Published abstracts and poster presentations

1. Nam, M.\*, Dhillon, A., **Vergara, M.N.**, Nagaraj, R.H. "Retinal neuroprotection by the HspB1 phosphomimetic mutant." ARVO Annual Meeting 2023. New Orleans, LA. April 23-27, 2023. Abstract # 2576 - B0216.
2. Tarchick, M., Cusato, K., Onyak, J.R., Vielle, A., Brzezinski, J.A., **Vergara, M.N.**, Renna, J.M.\* "A simple method for shipping human pluripotent stem cell-derived retinal organoids." ARVO Annual Meeting 2023. New Orleans, LA. April 23-27, 2023. Abstract # 3190 - C0383.
3. Seigel, G.M.\*, **Vergara, M.N.**, Furey, K., Shah, D. "A retinal organoid model of retinoblastoma." ARVO Annual Meeting 2023. New Orleans, LA. April 23-27, 2023. Abstract # 1317.
4. **Vergara, M.N.\***, Vielle, A., Li, H.T., James, E., Johnson, N.R., Chial, H.J. and Potter, H. "Modeling retinal Alzheimer's disease histopathology with human iPSC-derived retinal organoids for mechanistic



- and drug development studies." (Abstract #67785). Alzheimer's Association International Conference. San Diego, CA. July 31 – August 4, 2022.
5. **Vergara, M.N.\***, Secora, C.N., Vielle, N., Wang, A.C-J, Lenhart, P., Salcedo, E., Johnson, N.R., Ahmed, M.M., Chial, H.J., Boyd, T.D. and Potter, H. "Traumatic Brain Injury Exacerbates Retinal Alzheimer's Disease Histopathology in the TgF344 Rat Model." (Abstract #68278). Alzheimer's Association International Conference. San Diego, CA. July 31 – August 4, 2022.
  6. Dooling, B., Johnson, N.R., Joshi, M., Vielle, A., **Vergara, M.N.**, Potter, H. "Interrogating the role of APOE4 in Alzheimer's disease and Down syndrome using human induced pluripotent stem cells (hiPSC)-derived cerebral organoids." (Abstract #68061). Alzheimer's Association International Conference. San Diego, CA. July 31 – August 4, 2022.
  7. Ahmed, M.M., Wang, A.C-J., Boyd, T.D., Solano, D.A., Vielle, A., Markham, N., Coughlan, C.M., Chial, H.J., **Vergara, M.N.**, Potter, H. "Granulocyte-Macrophage Colony-Stimulating Factor Reduces Two Major Pathological Hallmarks of Alzheimer's Disease and Astrogliosis in the TgF344-AD Rat Model." (Abstract #66785). Alzheimer's Association International Conference. San Diego, CA. July 31 – August 4, 2022.
  8. **Vergara, M.N.\***, Vielle, A., Li H.T., James, E., Johnson, N.R., Chial, H.J. and Potter, H. "Modeling retinal Alzheimer's disease histopathology with human iPSC-derived retinal organoids." (Abstract # 3714544). ARVO Annual Meeting 2022. Denver, CO. May 1-4, 2022.
  9. Ahmed, M.M., Wang, A.C.J., Boyd, T.D., Solano, D.A., Vielle, A., Markham, N., Coughlan, C.M., Chial, H.J., **Vergara, M.N.**, and Potter, H. "Granulocyte-Macrophage Colony-Stimulating Factor Reverses Alzheimer's Disease Pathology in the TgF344-AD Rat Model." (Poster #71). Alzheimer's Association International Conference. Denver, CO. July 26<sup>th</sup>, 2021.
  10. **Vergara, M.N.\***, Schwanke, M. "Using iPSC-derived retinal organoids as a model of human retinal development." Keystone Symposia on Molecular and Cellular Biology: "iPSCs, a decade of progress and beyond." (Poster #3019). Olympic Valley, CA. March 25—29, 2018.
  11. **Vergara, M.N.**, Flores-Bellver, M., Aparicio-Domingo, S., McNally, M.M., Wahlin, K.J., Saxena, M.T., Mumm, J.S., and Canto-Soler, M.V. "Development of an automated platform for large-scale fluorescence screening of 3-D retinal organoids." ARVO 2017 Annual meeting. Baltimore, MD. May 7-11, 2017.
  12. **Vergara, M.N.**, Flores-Bellver, M., Aparicio-Domingo, S., McNally, M.M., Mumm, J. and Canto-Soler, M.V. "Enabling high throughput screening in 3-D retinal organoids: automated reporter quantification technology (3D-ARQ)." Gordon Research Conference on Visual System Development. Mount Snow, West Dover, VT. August 7-12, 2016.
  13. **Vergara, M.N.**, Flores-Bellver, M., Aparicio-Domingo, S., McNally, M.M., Mumm, J. and Canto-Soler, M.V. "Development of a high throughput screening platform for stem cell-derived retinal organoids." From Stem Cells to Human Development Meeting. The Company of Biologists. Southbridge, MA. September 25-28, 2016.
  14. **Vergara, M.N.**, McNally, M.M., Phuong, L. and Canto-Soler, M.V. "The multivalent transcription factor CTCF regulates neural progenitor cell survival in early eye development." Gordon Research Conference and Seminar on Visual System Development. Lucca, Italy. May 25-30, 2014.
  15. **Vergara, M.N.**, McNally, M.M., Phuong, L. and Canto-Soler, M.V. "The multivalent transcription factor CTCF regulates neural progenitor cell survival in early eye development." Johns Hopkins Post-doctoral Retreat. Baltimore, MD. May 16, 2014.

16. **Vergara, M.N.** and Canto-Soler, M.V. "Loss of function of the nuclear factor CTCF leads to microphthalmia and abnormal patterning of the retina." ARVO 2011 Annual meeting. Fort Lauderdale, FL. May 1-5, 2011.
17. **Vergara, M.N.** and Canto-Soler, M.V. "The nuclear factor CTCF is critical for proper eye development." Johns Hopkins Postdoctoral Association- 3rd. Annual Postdoctoral Symposium. Baltimore, MD. February 22, 2011.
18. **Vergara, M.N.** and Del Rio-Tsonis, K. "Xenopus laevis: a new model of retina regeneration." XVII International Congress of Eye Research. Buenos Aires, Argentina. October 29- November 3, 2006.
19. **Vergara, M.N.**, Collins, K.R., Jerome, A.S., Del Rio-Tsonis, K. "Xenopus laevis: a new model for retina regeneration studies." 65th Annual Society for Developmental Biology Meeting. Ann Arbor, MI. June 17-21, 2006.
20. **Vergara, M.N.**, Collins, K.R., Jerome, A.S., Del Rio-Tsonis, K. "Xenopus laevis: a new model for retina regeneration studies." Neuroscience Day. Ohio Miami Valley Society for Neuroscience. Oxford, OH. May 8, 2006.
21. **Vergara, M.N.**, Collins, K.R., Frisch, N.C., Jerome, A.S., Del Rio-Tsonis, K. "Novel roles for classical morphogens in retina regeneration." Great Lakes & Abrahamson Pediatric Eye Institute Vision Research Conference. Cincinnati, OH. Nov. 11-12 2005.
22. **Vergara, M.N.**, Collins, K.R., Frisch, N.C., Jerome, A.S., Del Rio-Tsonis, K. "Novel roles for classical morphogens in retina regeneration." ARVO Western Eye Research Conference. Laguna Beach, CA. September 25-28, 2005.
23. **Vergara, M.N.**, Collins, K.R., Frisch, N.C., Jerome, A.S., Del Rio-Tsonis, K. "Novel roles for classical morphogens in retina regeneration." Society of Developmental Biology Midwest Meeting. Chicago, IL. July 25-28, 2005.
24. **Vergara, M.N.**, Collins, K.R., Frisch, N.C., Jerome, A.S., Del Rio-Tsonis, K. "Molecular pathways in retina regeneration." Best Pre-Doctoral Poster Award. Neuroscience Day. Ohio Miami Valley Society for Neuroscience. Dayton, OH. May 10, 2005.
25. **Vergara, M.N.**, Collins, K.R., Frisch, N.C., Jerome, A.S., Del Rio-Tsonis, K. "Molecular pathways in retina regeneration." 9th Cincinnati Neurofest and 3rd Cincinnati Translational Neuroscience Symposium. Cincinnati, OH. March 11-12, 2005.
26. **Vergara, M.N.**, Spence, J.R., Madhavan, M.C., Kramer, E.L., Call, M.K., Santiago, W.G., Vallance, J.E., Robbins, D.J., Tsonis, P.A., Del Rio-Tsonis, K. "A Novel Role of the Hedgehog Pathway in Lens Regeneration." Great Lakes Vision Research Conference. Oxford, OH. October 18, 2003.
27. **Vergara, M.N.**, Spence, J.R., Madhavan, M.C., Kramer, E.L., Call, M.K., Santiago, W.G., Vallance, J.E., Robbins, D.J., Tsonis, P.A., Del Rio-Tsonis, K. "A Novel Role of the Hedgehog Pathway in Lens Regeneration." Indiana University Biocomplexity IV Workshop: Regenerative Biology and Medicine. Bloomington, IN. May 14-18, 2003.

Presentations by Trainees (underlining denotes trainees)

1. Howell, A.C.\*, Vielle, A., Park, Y.K., Mathiyakom, N., Parween, S., Cusato, K., Lee, B. and **Vergara, M.N.\*** "9-cis-Retinal Supplementation Accelerates Photoreceptor Development and Maturation in Human Stem Cell-Derived Retinal Organoids." ARVO Annual Meeting 2023. New Orleans, LA. April 23-27, 2023. Abstract # 3642 - C0356.

2. Ha, M., Aguilera-Rico, C., Anne Vielle, A., Howell, A. and **Vergara, M.N.\*** "Modeling of Down Syndrome Pathophysiology in the Retina Using Human Stem Cell-Derived Retinal Organoids." Anatomy Connected 2023 meeting, Washington, DC. March 25-27, 2023. Abstract # 1416803.
3. James, E., Vielle, A., Li, H.T., Johnson, N.R., Chial, H.J., Potter, H., and Vergara, M.N.\* "Development of a Novel Human iPSC-Derived Organoid Model of Retinal Alzheimer's Disease Histopathology". Neuroscience 2022 Annual Meeting. San Diego, CA. November 12-16, 2022. Winner of Society for Neuroscience travel award for trainees.
4. Ha, M., Vielle, A., Aguilera-Rico, C. and **Vergara, M.N.\***. "Modelling of Down Syndrome Pathophysiology in the Retina Using Retinal Organoids". Crnic Institute Down Syndrome Research Symposium. Aurora, CO. September 21<sup>st</sup>, 2022. Poster #9. Winner of poster award.
5. Aguilera-Rico, C., Vielle, A., Ha, M. and **Vergara, M.N.\*** "Signs of Alzheimer's Disease in Down Syndrome Retinal Organoids," Gates Summer Internship Program, Final Day Poster Session. University of Colorado Anschutz Medical Campus. Aurora, CO. August 3<sup>rd</sup>, 2022. Poster #1. 1<sup>st</sup> prize poster award.
6. Howell, A.C., Vielle, A., Park, Y.K., Mathiyakom, N. and **Vergara, M.N.\***. "Improved Protocol for hiPSC-derived Retinal Organoid Generation Increases Yield and Decreases Variability." (Abstract # 3714728). ARVO Annual Meeting 2022. Denver, CO. May 1-4, 2022.
7. Mathiyakom, N., Vielle, A., Howell, A.C., Park, Y. and **Vergara, M.N.\*** "Improved protocol for retinal organoid generation increases yield and accelerates photoreceptor differentiation". Short talk. Rocky Vista University Research Day. Parker, CO. October 15<sup>th</sup>, 2021.
8. Li, H.T., Vielle, A., and **Vergara, M.N.\*** "Development of a Novel Stem Cell-Derived Organoid Model of Retinal Alzheimer's Histopathology," Gates Summer Internship Program, Final Day Poster Session. University of Colorado Anschutz Medical Campus. Aurora, CO. August 4<sup>th</sup>, 2021. Poster #10. 1<sup>st</sup> prize poster award.
9. Vielle, A., Park, Y.K., and **Vergara, M.N.\*** "Development of optimized protocols for the generation of Retinal Organoids from hiPSC." ARVO 2021 Annual Meeting. May 2<sup>nd</sup>, 2021. Published abstract: Investigative Ophthalmology & Visual Science 62(8), 1686.
10. Park, Y.K., Brooks, T., Vielle, A., and **Vergara, M.N.\*** "Investigating the Timing and Regulation of Developmental Retinal Ganglion Cell Death in Human Stem Cell-Derived Organoids." ARVO 2021 Annual Meeting. May 1<sup>st</sup>, 2021. Oral presentation. Published abstract: Investigative Ophthalmology & Visual Science 62(8), 3153.
11. Secora, C., Vielle, A., Lenhart, P., Park, Y.K., Boyd, T.D., Wang, A.C., Potter, H. and **Vergara, M.N.\*** "Traumatic Brain Injury Exacerbates Alzheimer's Disease Pathology in the Retina of Rats." Short talk. American Society for Investigative Pathology Minisymposium. Experimental Biology Meeting 2021. April 27<sup>th</sup>, 2021. Abstract#: 4690
12. Secora, C., Vielle, A., Lenhart, P., Park, Y.K., Boyd, T.D., Wang, A.C., Potter, H. and **Vergara, M.N.\*** "Traumatic Brain Injury Exacerbates Alzheimer's Disease in the Retina." Modern Human Anatomy Virtual Symposium. University of Colorado Anschutz Medical Campus, Aurora, CO. April 21<sup>st</sup>, 2021.
13. Brooks, T., Vielle, A., Park Y.K. and **Vergara, M.N.\*** "Elucidating the Mechanisms of Developmental Cell Death in the Retina Using Stem Cell-derived Organoids." ARVO 2020 Annual Meeting. Published abstract: Invest. Ophthalmol. Vis. Sci. 2020;61(7):3805.

14. Brooks, T., Vielle, A., Park Y.K. and **Vergara, M.N.\*** "Elucidating the Mechanisms of Developmental Cell Death in the Retina Using Stem Cell-derived Organoids." Modern Human Anatomy Virtual Symposium. University of Colorado Anschutz Medical Campus, Aurora, CO. April 6<sup>th</sup>, 2020.
15. Vielle, A., McNally, M.M., Flores-Bellver, M., Aparicio-Domingo, S., Canto-Soler, M.V.\*, and **Vergara, M.N.\*** "CTCF is required for retinal progenitor cell survival in early eye development." (Poster #42). Southwest Society for Developmental Biology Meeting. Denver, CO. March 7-9, 2019.

## RESEARCH FUNDING

### Current research funding

- 2023-2028 "Investigating and targeting apolipoprotein E4 in Down syndrome-associated Alzheimer's disease."  
NIH 1R01AG074114-01 NIA  
PI: Johnson, N.R.  
Role: Co-I
- 2023- 2025 "Modeling Alzheimer's disease in the retina for therapeutic development."  
Glendorn Foundation  
Role: PI
- 2023- 2026 "Restoration of Vision in Glaucoma through Cell Therapy."  
Gates Institute Grubstake Award  
PI: Nam, M.  
Role: Co-PI
- 2023- 2025 "A retinal organoid platform for retinoblastoma drug development."  
Childhood Eye Cancer Trust  
Role: Co-PI
- 2022- present "Improved Fluorescent Reporter Quantification-Based 3D Retinal Organoid Paradigms for Drug Screening".  
National Eye Institute's 3D-Retinal Organoid Challenge Award, Phase III  
Role: PI- Team Leader
- 2021-2024 "Novel tools for screening retinal function using improved human retinal organoid models."  
NIH R21EY033127  
Multi-PI: Renna, J, Vergara, MN; Co-I: Brzezinski, J.
- 2021-2025 "Development of an organoid-based platform for drug discovery for photoreceptor degenerative diseases"  
Philanthropic support from Gates Frontiers Fund, Solich Family Fund, Sue Anschutz-Rodgers.  
Role: PI
- 2017-present "Development of organoid-based drug discovery paradigms and adjuvant therapies for retinal transplants"  
CellSight program funding- Startup.  
Role: PI

### Completed research funding

- 2020-2023 "Unraveling the molecular basis of retinal abnormalities in Down syndrome"

- RNA Biosciences Initiative.  
Role: PI.
- 2021-2022 "Improved Fluorescent Reporter Quantification-Based 3D Retinal Organoid Paradigm for Drug Screening".  
National Eye Institute's 3D-Retinal Organoid Challenge Award, Phase II  
Role: PI- Team Leader
- 2020-2021 "Development a retinal organoid based platform to assess drug efficacy that is predictive of clinical outcomes"  
ProQR Therapeutics, Collaborative Research Agreement.  
Role: PI
- 2019-2020 "Exploring the retinal manifestations of Alzheimer's disease in Down syndrome: An iPS cell-derived retinal organoid approach"  
The Linda Crnic Institute Grand Challenge Grant.  
Role: PI

### **Prior research support, training grants and travel awards**

- 2012-2013 "Functional analysis of CTCF in retina development"  
The Ruben Adler Research Award, The Wilmer Eye Institute, Johns Hopkins University.  
Role: PI
- 2007-2008 "Lens and retina regeneration in amphibian models"  
Dissertation Scholarship, Miami University
- 2006-2007 "Potential of Human retinal progenitor cells to participate in retina repair/regeneration using the embryonic chick as a model"  
DUOS grant, Miami University.  
Role: PI
- 2004-2005 "Understanding the Molecular Mechanisms involved in Retina Regeneration through the Process of Transdifferentiation"  
DUOS grant, Miami University.  
Role: PI
- 2004-2005 "Retina regeneration and the role of FGFs"  
Grant-In-Aid of Research, Sigma Xi Scientific Research Society.  
Role: PI
- 2003-2004 "Isolation and cloning of the six3 gene in the newt"  
Bioinformatics Research Grant, Miami University.  
Role: PI
- 2003-2004 "Retina regeneration: a new hope for diabetic retinopathy"  
The Madalene and George Shetler Diabetes Research Award, Miami University.  
Role: PI

## TEACHING RECORD

### Formal course instruction

- 2023-present Lecturer, BMSC 7810 - Core Topics in Biomedical Science (Fall Semester, Graduate level). "Bioengineering of the Eye" lecture and laboratory tour. University of Colorado School of Medicine, Aurora, CO.
- 2023-present BIOE 5420-004- Special Topics in Bioengineering: Stem Cells & Regenerative Medicine (Fall Semester, Graduate level). "Bioengineering of the Eye" lecture and paper discussion session. University of Colorado School of Medicine, Aurora, CO.
- 2023 BIO 361- Patterns in Development, Invited Lecturer. Topic: "Eye development and stem cell-derived retinal organoids." Miami University, Oxford, OH.
- 2019-present Organoids Course (CSDV767- Fall Semester, Graduate level), Lecturer, "Retinal Organoids" module. University of Colorado School of Medicine, Aurora, CO.
- 2017-present Biology of the Eye (OPHT 5610/NRSC7618- Fall Semester, Graduate level course), Lecturer, "Retina I" and "Retina discussion" sections. Department of Ophthalmology, University of Colorado School of Medicine, Aurora, CO.
- 2018-2020 Molecules to Medicine- Small group facilitator, "Gaucher disease" and "Scientific method" sessions. University of Colorado School of Medicine, Aurora, CO.
- 2017-2019 SABES Spanish course for medical students, Faculty mentor. University of Colorado School of Medicine, Aurora, CO.
- 2014 Cellular and Molecular Biology of Photoreceptors in Health and Disease (graduate level course), Lecturer, "Development and Organization of the Vertebrate Retina" module. Department of Ophthalmology, Johns Hopkins University School of Medicine, Baltimore, MD.
- 2006-2007 Developmental Biology (ZOO 202), Teaching Assistant. In charge of the laboratory component of the course. Department of Zoology, Miami University, Oxford, OH.

### Course development

- 2020-present Course Director, Biology of the Eye (OPHT 5610-6610- NRSC 7618- Fall Semester, Medical/Graduate course). University of Colorado School of Medicine, Aurora, CO. Collaborated on syllabus development, course organization and adaptation to an online delivery format.
- 2019 Co-Director, Open Educational Resources Workshop Series, Open CU Initiative. Participated in course concept, design and assessment, and in the development of educational materials. University of Colorado Anschutz Medical Campus. Aurora, CO.
- 2001-2002 Molecular and Cell Biology (course for students in the Nursing and Radiology tracks), Adjunct Professor in charge of developing and teaching lectures, colloquia and laboratory. Three semesters. Universidad Autónoma de Entre Ríos, Paraná, Argentina.
- 2001 Molecular Biology (graduate level course for bioengineers), Lecturer "Eukaryotic Cell Culture" module. Designed course syllabus and instructional materials. Universidad Nacional de Entre Ríos, Oro Verde, Argentina.

### Educational Leadership/Program Development

- 2022 Regional Education Conference: Colorado OER Conference 2022, Colorado Department of Higher Education. Panel speakers: **M. Natalia Vergara**, Teresa Connelly, Ellie Sbovoda, David Bourne, Michael Lampe, Jessica Hitt-Lausten. Title: "From Sciences to Health Sciences: Addressing Challenges of OER". Denver, CO, June 24th, 2022.
- 2021 Regional Education Conference: Colorado Teaching and Learning with Technology (COLTT). Presenters: David Bourne, Michael Lampe, **M. Natalia Vergara**, Stabio M, Moldovan R, Glazner G, and Rustici M. Talk title: "OER: To the textbook and beyond!" Virtual event. August 5th, 2021.
- 2020 National Open Education Conference. Panel speakers: Michael Lampe, Ellie Svoboda, Ben Harnke, Jessica Hitt-Laustsen, **M. Natalia Vergara**, David Bourne. Session title: "[Where in the World is Your OER Content?: Using Analytics for your Portfolio.](#)" Virtual event. November 10<sup>th</sup>, 2020.
- 2020 Regional Education Conference: Colorado Teaching and Learning with Technology (COLTT). Panel speakers: Michael Lampe, Ellie Svoboda, Ben Harnke, Jessica Hitt-Laustsen, **M. Natalia Vergara**, David Bourne. Session title: "Where in the World is Your OER Content?: Using Analytics for your Portfolio." Virtual event. August 5<sup>th</sup>, 2020.
- 2019 Regional Education Conference: Colorado Teaching and Learning with Technology (COLTT). Panel speakers: **M. Natalia Vergara**, Margaret Wood, Deborah Keyek-Franssen, David Anderson, Merinda McLure. Session title: "Open CU: Building a Sustainable OER Initiative Across the University of Colorado." Boulder, CO. August 8<sup>th</sup>, 2019.
- 2018-present Faculty Development Program Co-Director, Open CU-AMC Initiative. This program was funded by a grant from the Colorado Commission on Higher Education, and it was created with the goal of increasing awareness and promoting adoption of open educational resources among Faculty within the six University of Colorado Schools at the Anschutz Medical Campus. Phase 1 of the program consists of a series of workshops to increase awareness of OER among teaching Faculty. Phase 2 involves a competitive grant program and instructional design support for AMC Faculty to adopt OER in their courses. Phase 3 involves a competitive grant program for educators to create OER. The program also includes public events and invited speakers, as well as an OER Champion Award Program.

### Participation in Thesis Committees

- 2022-present Capstone Committee Member for Michael Ha, Masters in Modern Human Anatomy Program, University of Colorado Anschutz Medical Campus. Aurora, CO.
- 2021-present Ph.D. Thesis Committee Member for Breana Dooling, Graduate Student, Human Medical Genetics and Genomics Program, CU Anschutz. Aurora, CO.
- 2021-present Ph.D. Thesis Committee Member for Omar E. Ochoa Olmos, Graduate Student, Cell Biology, Stem Cells and Development Graduate Program, CU Anschutz. Aurora, CO.
- 2021-present Ph.D. Thesis Committee Member for Ian Purvis, Graduate Student, Cell Biology, Stem Cells and Development Graduate Program, CU Anschutz. Aurora, CO.
- 2020-2021 Capstone Committee Member for Conner Secora, Masters in Modern Human Anatomy Program, University of Colorado Anschutz Medical Campus. Aurora, CO.

- 2019-2020 Capstone Committee Member for Tara Brooks, Masters in Modern Human Anatomy Program, University of Colorado Anschutz Medical Campus. Aurora, CO.
- 2017 Ph.D. Thesis Committee Member for Natalia Martinez Gil, Ph.D. candidate, School of Medicine and Dentistry, Catholic University of Valencia, Spain.

### **Mentoring (at the University of Colorado only)**

- 2023-present Stefanie Varghese. Junior, University of Colorado Denver.
- 2023 Mentor to three High School students: Charlotte Frampton, Kent Denver School; Ziba Ahamad, Peak to Peak Charter school; and Nathan Yang, Cherry Creek High School; for short summer internships.
- 2023 Amelia Grosskopf; Junior, Middlebury College. Summer intern through the Gates Summer Internship Program, University of Colorado Anschutz Medical Campus.
- 2022-present Career mentor for Cassandra Minne, Ph.D. student, Molecular Biology Program, University of Colorado Anschutz Medical Campus. Women in STEM (WiSTEM) mentoring program.
- 2022-present Karen Cusato, Ph.D.. Research Scientist.
- 2022-present Shama Parween, Ph.D.. Postdoctoral Fellow.
- 2022 Citlali Agilera-Rico. Senior, Middlebury College. Summer intern through the Gates Summer Internship Program, University of Colorado Anschutz Medical Campus. *Won 1<sup>st</sup> prize for scientific poster at the 2022 GSIP meeting.*
- 2022-present Michael Ha. Graduate Student, Master of Science in Modern Human Anatomy program, University of Colorado Anschutz Medical Campus. *Won poster award at Crnic Down Syndrome Research Symposium 2022.*
- 2021-present Ethan James. Freshman, University of Colorado Boulder. *Awarded Biological Sciences Initiative Scholarship in STEM Undergraduate Research 2021-22 and 2022-23 for his work in our lab. Awarded the Undergraduate Research Opportunities Program (UROP) Individual Grant in 2023 and 2024. Won the BSI travel award and the Society for Neuroscience Travel Award to present his research at the Neuroscience 2022 meeting.*
- 2021 Nathan Mathiyakom, 2nd year Dr. of Osteopathy student, Rocky Vista University, Parker, CO. *Co-authored book chapter in Neuromethods, Springer Nature.*
- 2021 Helen Tingting Li. Senior, Cornell University. Summer intern through the Gates Summer Internship Program, University of Colorado Anschutz Medical Campus. *Won 1<sup>st</sup> prize for scientific poster at the GSIP meeting; co-authored book chapter in Neuromethods, Springer Nature.*
- 2020-2021 Career mentor for Sarah Hinkson. Graduate student, Biomedical Sciences and Biotechnology Masters program, University of Colorado Anschutz Medical Campus. Women in STEM (WiSTEM) mentoring program.
- 2020-2021 Conner Secora. Graduate Student, Master of Science in Modern Human Anatomy program, University of Colorado Anschutz Medical Campus. *Selected to give talk at the Experimental Biology 2021 meeting; co-authored review article in Frontiers in Cellular Neuroscience; co-authored a manuscript submitted for publication.*



- 2019-2021 Yuna Park. Graduate student, Master of Science in Modern Human Anatomy program, University of Colorado Anschutz Medical Campus. Published abstract in IOVS; *Co-authored review article in Frontiers in Cellular Neuroscience; co-authored 2 manuscripts submitted for publication.*
- 2019-2020 Tara Brooks. Graduate student, Master of Science in Modern Human Anatomy program, University of Colorado Anschutz Medical Campus. *Published abstract in IOVS; co-authored manuscript submitted for publication*
- 2018 Davis Aasen. Second year Medical student, University of Colorado School of Medicine. *Co-authored review article published in the Journal of Ocular Pharmacology and Therapeutics.*

### **Outreach Activities**

- 2023 Department of Ophthalmology Lead for Girls' Careers Day, organized by the Ludeman Family Center for Women's Health Research. Introduced 45 High School girls to topics in ophthalmology through a 15-minute anatomy of the eye lecture and a 45-minute wet lab on eye dissection, color vision, stereo, disease simulation and eye pathology slides, ending with a leadership panel discussion on careers in science and healthcare, barriers faced by women, and mentorship on how to build a successful career. University of Colorado Anschutz Medical Campus. June 6<sup>th</sup>, 2023.
- 2022 Vergara Lab retinal confocal micrography images displayed at the "[Neuron Forest](#)" art exhibit, featuring artist Katie Caron and neuroscientist Maureen Stabio. Organized by the CU Center for Bioethics and Humanities to raise public awareness of neuroscience. Fulginiti Pavilion Art Gallery. On display September 22 to December 20, 2022.
- 2021 Panelist, UpLift Career panel for Aurora High School. WELCOME outreach program, University of Colorado. May 19<sup>th</sup>.
- 2019 Invited speaker to the Annual Meeting of the Colorado Council of Medical Librarians. Talk title: "Developing treatments for blinding diseases using stem cells." Aurora, CO. Sept 13<sup>th</sup>.
- 2019 Invited Speaker, ARVO High School Vision Program. Talk title: "Introduction to the Eye" Vancouver, Canada. April 30<sup>th</sup>.
- 2018 Invited Speaker, ARVO High School Vision Program. Talk title: "Introduction to the Eye" Honolulu, HI. May 1<sup>st</sup>.
- 2018 Faculty mentor to four middle school minority students, Earth Explorers Science Film Project. Westview Middle School, Longmont, CO. Fall semester.

### **Media Interviews**

- 2022 Video interview for VJDementia (the Video Journal of Dementia) on "[Investigating the impact of TBI on Alzheimer's pathology in the retina](#)". August 10th, 2022.
- 2020 Interviewed for "[People Behind the Science](#)" Podcast. March 9<sup>th</sup>.

## **MAJOR COMMITTEE AND SERVICE RESPONSIBILITIES**

### **National/International Committees**

- 2018-2020 Co-chair, DIC Workshop Organizing Committee. ARVO.
- 2017-2020 Diversity Initiatives Committee Member, Association for Research in Vision and Ophthalmology (ARVO). Responsibilities included: Monitoring the issues facing ARVO

Members of minority groups, women and those with special needs, and developing initiatives to address these concerns.

### **University Committees**

- 2023- present Member, Strategic Infrastructure for Research Committee (SIRC) of the SOM.2003  
7th Annual Great Lakes Vision Research Conference Organizing Committee. Oxford, OH.
- 2023- present Ophthalmology Representative, CU School of Medicine Wellbeing Leadership Committee.
- 2022- present Director, Department of Ophthalmology Faculty Wellness Committee.
- 2019- present Co-Director OpenCU OER Program, Anschutz Medical Campus.
- 2018- present Member, University of Colorado System OER Steering Team. Participated in CU System-wide OER grant submissions to develop an implement an OER program at the University of Colorado. Grants were awarded by the Colorado Commission on Higher Education (CCHE) for five consecutive award rounds (2019-2024).
- 2018- present CU-AMC Open Educational Resources (OER) Council Member. University of Colorado Anschutz Medical Campus.
- 2010- 2011 Wilmer Eye Institute Research Discussion Organizing Committee. Johns Hopkins University School of Medicine.
- 2008 - 2009 Association of Latin American Faculty and Staff, Member. Miami University.
- 2007 - 2008 Latin American Graduate Student Association, Founder, Member and P.R. officer. Miami University.
- 2004 - 2007 UniDiversity Festival Organizing Committee Member. Center for American and World Cultures. Miami University.

### **Other University and Community Service Activities**

- 2021- present Organizer, Department of Ophthalmology Research Group's Annual Day of Service. Collaboration with Project Worthmore and DeLaney Community Farm.
- 2021 Scientific Poster Judge, 36th Annual AMC Student Research Forum, University of Colorado Anschutz Medical Campus Aurora, CO.
- 2020 ARVO-SACNAS Award committee member.
- 2019 Scientific Poster Judge, Gates Summer Internship Program (GSIP), Aurora, CO. August 11<sup>th</sup>
- 2019 Scientific Poster Judge, Society for Developmental Biology Southwest regional meeting, Aurora, CO. March 7-9.
- 2018- 2019 Volunteer, ARVO High School Program.
- 2018- 2019 Scientific Poster Judge, Denver Metro Regional Science and Engineering Fair. Denver, CO. Junior Medicine and Health Category Team Captain, 2019.
- 2018 Judge, Annual Student MSA Capstone Poster Presentation. University of Colorado Denver School of Medicine. Aurora, CO.
- 2018 Habitat for Humanity, Dept. of Ophthalmology Day of Service.
- 2018 Vision screening volunteer, Rolling Hills Elementary School. Aurora, CO.

- 2004- 2005 Volunteer ESL Instructor. Oxford Family Resource Center. Oxford, OH.
- 1995- 2002 Member of Rotaract Club de Paraná, Rotary International. Served as President and as Director of Community Service Programs.
- 1992 -1998 Volunteer. Special Olympics. Paraná, Entre Ríos, Argentina
- 1997 Volunteer. Children’s Hospital. Paraná, Entre Ríos, Argentina.

## **REVIEW AND REFEREE WORK**

### **Service on NIH Study Section**

- 2023 F03B Neuroscience Fellowship study section, NIH Center for Scientific Review. June, 2023.
- 2022 Study section member, ZRG1 ETTN-P 81 S, Special Topics: Vision Imaging, Bioengineering and Low Vision Technology Development (BIVT). NIH Center for Scientific Review. October, 2022.
- 2021 Study section member, ZRG1 ETTN-P 81 S, Special Topics: Vision Imaging, Bioengineering and Low Vision Technology Development (BIVT). NIH Center for Scientific Review. October, 2021.
- 2021 Study section member, ZRG1 ETTN-P 81 S, Special Topics: Vision Imaging, Bioengineering and Low Vision Technology Development (BIVT). NIH Center for Scientific Review. May, 2021.

### **Service on University Study Section**

- 2023- present Grant reviewer, “Strategic Infrastructure for Research” and “Across the Finish Line” grant mechanisms, University of Colorado School of Medicine.

### ***Ad-Hoc* Grant Reviewer Activities**

- 2023 National Aeronautics and Space Administration (NASA)
- 2021 Moorfields Eye Charity
- 2021 Swiss National Science Foundation
- 2020 Nevada IDeA Network of Biomedical Research Excellence Program
- 2019 European Research Council
- 2018 American Institute of Biological Sciences- For Nevada-INBRE
- 2017 U.S. National Science Foundation
- 2017 Swiss National Science Foundation

### **Journal Editorial Board Memberships**

- 2022- present Frontiers in Neuroscience

### **Journal *Ad-Hoc* Reviewer Activities**

- 2022 Life Science Alliance, Investigative Ophthalmology and Visual Science, Cells
- 2021 Stem Cell Reports, Current Research in Neurobiology

2020 Antioxidants, Gene Therapy, Frontiers in Neuroscience, Journal of Clinical Medicine  
2019 Stem Cells and Development; Scientific Reports; Developmental Biology; Gene Therapy;  
Journal of Clinical Medicine  
2018 Experimental Biology and Medicine; Human Genetics; Molecular Biology and Evolution;  
Science Advances; Developmental Dynamics; Stem Cells and Development  
2017 Developmental Biology; Scientific Data  
2016 PLoS One  
2015 Cell Stem Cell; Experimental Eye Research; Journal of Visualized Experiments  
2010 The Biological Bulletin