

# GIANNI MARCELLO CASTIGLIONE, PH.D.

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## EXPERIENCE

- Postdoctoral Research Fellow**; Advisor: Elia J. Duh (M.D.) 2018-present  
*Department of Ophthalmology, Johns Hopkins University School of Medicine, Baltimore, MD. USA.*
- Postdoctoral Associate**; Advisor: Belinda S.W. Chang (Ph.D.) 2017-2018  
*Department of Ecology and Evolutionary Biology, University of Toronto, Toronto, ON. Canada.*

## EDUCATION

- Doctor of Philosophy (Ph.D.)**; Advisor: Belinda S.W. Chang (Ph.D.) 2011-2017  
*Department of Cell & Systems Biology, University of Toronto, Toronto, ON*  
*Dissertation: Functional Characterization and Molecular Evolutionary Analyses of Rhodopsin in Fishes and other Vertebrates*
- Bachelor of Science (B.Sc., Honours)** 2007-2011  
*Departments of Philosophy (Bioethics) and Cell and Systems Biology, University of Toronto, Toronto, ON*

## PUBLICATIONS

### *Forthcoming*

13. **Castiglione, G.M.**, Zhou L., Xu Z., Neiman Z., Hung, C.F. and Duh, E.J. (2021). The ancient cardioprotective mechanisms of ACE2 bestow SARS-CoV-2 with a wide host range. *In peer review*. Preprint available at *bioRxiv*: <https://www.biorxiv.org/content/10.1101/2021.01.03.425115v1>

### *Peer-reviewed*

12. Lam, B., Kung, Y.J., Lin, J., Tseng, S.H., Tsai, Y.C., He, L., **Castiglione, G.**, Egbert, E., Duh, E., Bloch, E.M., Tobian, A.A.R., Milstone, A.M., Roden, R.B.S., Wu, T.C., and Hung, C.F. (2021). In vivo characterization of emerging SARS-CoV-2 variant infectivity and human antibody escape potential. *Cell Reports*. Accepted. CELREP\_109838
11. Van Nynatten, A., **Castiglione, G.M.**, Gutierrez, E.A., Lovejoy N.R., and Chang, B. S.W. (2021). Recreated ancestral opsin associated with marine to freshwater croaker invasion reveals kinetic and spectral adaptation. *Molecular Biology and Evolution* 38 (4):2076-2087

10. Zhou, L., Xu, Z., **Castiglione, G.M.**, Soiberman, U.S., Eberhart, C.G., & Duh, E.J. (2020). ACE2 and TMPRSS2 are expressed on the human ocular surface, suggesting susceptibility to SARS-CoV-2 infection. *The Ocular Surface* 18 (4):537-544
9. **Castiglione, G. M.**, Xu, Z., Zhou, L. & Duh, E. J. (2020). Adaptation of the master antioxidant response connects metabolism, lifespan and feather development pathways in birds. *Nature Communications* 11, 2476  
[Editor's highlight 2020](#)  
 Featured in: [Baltimore Sun](#), [Washington Post](#)
8. **Castiglione G.M.** & Chang B.S.W. (2018). Functional trade-offs and environmental variation shaped ancient trajectories during the evolution of dim-light vision. *eLife*. 7: e35957
7. Gutierrez, E.A., **Castiglione, G.M.**, Morrow, J.M., Schott, R.K., Loureiro, L.O., Lim, B.K., and Chang B.S.W. (2018). Functional shifts in bat dim-light visual pigment are associated with differing echolocation abilities and reveal molecular adaptation to photic-limited environments. *Molecular Biology and Evolution*. 35 (10): 2422-2434.
6. **Castiglione, G.M.**, Schott R.K., Hauser F.E., and Chang B.S.W. (2018). Convergent selection pressures drive the evolution of rhodopsin kinetics at high altitudes *via* nonparallel mechanisms. *Evolution*. 72 (1): 170-186.
5. Hauser FE, Ilves KL, Schott RK, **Castiglione GM**, López-Fernández H, and Chang BSW. (2017). Accelerated evolution and functional divergence of the dim light visual pigment accompanies cichlid colonization of Central America. *Molecular Biology and Evolution*. 34 (10): 2650-2664.
4. **Castiglione G.M.**, Hauser F.E., Liao B.S., Lujan N.K., Van Nynatten A., Morrow J.M., Schott R.K., Bhattacharyya N., Dungan S.Z. and Chang B.S.W. (2017). Evolution of nonspectral rhodopsin function at high altitudes. *Proc. Natl. Acad. Sci. U.S.A.* 114 (28): 7385-7390.
3. Morrow J.M., **Castiglione G.M.**, Dungan S.Z., Tang P.L., Bhattacharyya N., Hauser F.E., Chang B.S.W. (2017). An experimental comparison of human and bovine rhodopsin provides insight into the molecular basis of retinal disease. *FEBS Letters*. 591: 1720-1731.
2. Hauser F.E., Schott R.K., **Castiglione G.M.**, Van Nynatten A., Kosyakov A., Tang P., Gow D., Chang B.S.W. (2016). Comparative sequence analyses of rhodopsin and RPE65 reveal patterns of selective constraint across hereditary retinal disease mutations. *Visual Neuroscience*. 33 (E002): 13 pages
1. Peek J., **Castiglione G.**, Shi T., Christendat D. (2014). Isolation and molecular characterization of the shikimate dehydrogenase domain from the *Toxoplasma gondii* AROM complex. *Molecular and Biochemical Parasitology*. 194(1-2):16-9

#### GRANTS, HONOURS, AND AWARDS

**Finalist, Postdoctoral Fellowship (\$186,000 total)**  
*Life Sciences Research Foundation*

2018

- *Selected by committee for private sponsorship.*
- *Proposed PI: Mary Caswell Stoddard, Princeton University*

**Honoured Participant, Science Policy Award of Excellence** 2017  
*Canadian Science Policy Centre*

- *Policy proposal selected by AAAS leadership and Canadian government officials*

**2018 Junior Fellow Nominee** 2017  
*Harvard University Society of Fellows*

**Finalist, TATP Teaching Award** 2015  
*University of Toronto*

- *First departmental member nominated by undergraduates in 8 years.*

**Vision Science Research Program Scholarship (\$58 000 total)** 2014-2016  
*University Health Network, Toronto*

#### INVITED TALKS IN POLICY AND THE HUMANITIES

1. **Castiglione G.M.** 2017. Canadian Innovation requires Online Collaboration between Experts and the Public. *9<sup>th</sup> Annual Canadian Science Policy Conference, Ottawa ON. (Invited poster)*
2. Bannister A. (Ph.D.), **Castiglione G.M.** 2016. Is God Relevant? *University of Toronto, Toronto ON. (Invited, debate)*
3. **Castiglione G.M.** 2015. Secular Humanism. *Spiritual & Religious Care Department, Scarborough Hospital, Toronto ON. (Invited, Didactic)*
4. **Castiglione G.M.** 2015. Humanism and the Secular Age. *Our Whole Society: Bridging the Religious-Secular Divide, Vancouver B.C. (Invited, Workshop)*

#### CONTRIBUTED PRESENTATIONS

1. Chiu Y.L.I., **Castiglione G.M.**, Gutierrez E.A., and Chang B.S.W. 2019. *Society for Molecular Biology and Evolution. Manchester, United Kingdom. (Poster)*
2. Van Nynatten A., **Castiglione G.M.**, Lovejoy N.R., and Chang B.S.W. 2018. *Society for Molecular Biology and Evolution. Yokohama, Japan. (Poster)*
3. Hauser F.E., Ilves K.L., Schott R.K., **Castiglione G.M.**, Lopez-Fernandez H., and Chang B.S.W. 2018. *Society for Molecular Biology and Evolution. Yokohama, Japan. (Poster)*
4. Gutierrez E.A., **Castiglione G.M.**, Morrow J., and Chang B. 2017. *Society for Molecular Biology and Evolution. Austin, TX. U.S.A. (Oral)*
5. **Castiglione G.M.** and Chang B. 2017. *Evolution. Portland, OR. U.S.A. (Poster)*
6. **Castiglione G.M.**, Lujan N., and Chang B. 2017. *Evolution. Portland, OR. U.S.A. (Oral)*

7. Hauser F., Ilves K., Schott R., **Castiglione G.M.**, Lopez-Fernandez H., and Chang B. 2017. *Evolution*. Portland, OR. U.S.A. (Oral)
8. Gutierrez E. A., **Castiglione G.M.**, Morrow, J.M., and Chang B. 2017. *Evolution*. Portland, OR. U.S.A. (Oral)
9. **Castiglione G.M.** and Chang B.S.W. 2016. *58<sup>th</sup> Annual Vision Science Research Day, University Health Network*. Toronto, ON. (Poster)
10. Hauser F.E., Tang P.L., Schott R.K., **Castiglione G.M.**, Van Nynatten A., Heon E., Chang B.S.W. 2016. *Great Lakes Bioinformatics and Canadian Computational Biology Conference*, Toronto ON. (Poster)
11. Cook T. (M.D.), Dias A. (Ph.D.), Richards M. (M.D.), **Castiglione G.M.** (moderator). 2016. *University of Toronto*, Toronto ON. (Oral, panel)
12. **Castiglione G.M.**, Chang B.S.W. 2015. *Department of Cell and Systems Biology, University of Toronto*, Toronto ON. (Oral, Departmental Seminar)
13. **Castiglione G.M.**, Liao B.S., Lujan N.K., and Chang B.S.W. 2015. *57<sup>th</sup> Annual Vision Science Research Day, University Health Network*, Toronto, ON. (Poster)
14. Rizvi A., **Castiglione G.** (moderator). 2014. *University of Toronto*, Toronto ON. (Oral)

## TEACHING

<b>Teaching Assistant, BIO230- “From Genes to Organisms”</b> Cell and Systems Biology, University of Toronto	Sept. 2011-Dec. 2016
<b>Teaching Assistant, CSB349- “Eukaryotic Gene Expression”</b> Cell and Systems Biology, University of Toronto	Sept. 2013- Apr.2016
<b>Course Design Assistant, CSB201/202- “Biotechnology and You”</b> Cell and Systems Biology, University of Toronto	May 2013-Sept. 2013
<b>Teaching Assistant, BIO130- “Molecular and Cellular Biology”</b> Cell and Systems Biology, University of Toronto	Jan. 2012- May 2013

## MENTORING AND SUPERVISION

<b>Research Technicians and Undergraduate Students</b> Johns Hopkins University, School of Medicine	2019-present
<ul style="list-style-type: none"> <li>○ Grace Lee (research technician)</li> <li>○ Zachary Neiman (research technician)</li> <li>○ Shirley Wu (research project student)</li> </ul>	

**Graduate Students** 2017-2018

University of Toronto

- *Assisted in supervising during my PI's medical leave*
  - o Eduardo Gutierrez (Ph.D. candidate; conferred May 2018)
  - o Ahmed Elbassiouny (Ph.D. candidate)
  - o Matthew Woo (M.Sc. student)
  - o Yan (Iris) Chiu (M.Sc. student)

**Undergraduate Students** 2014-2018

University of Toronto

- o Alexandra Kraft (research project student)
- o Sophia Chimenti (work study and project student)
- o Van Shen (research project student)
- o Zhifan Wu (research project student)
- o Brian Xuan Viet Ngheim (work study student)
- o Clare Sheen (work study student)
- o Brian Liao (research project student)
- o Kenneth Tang (work study and research project student)

ACADEMIC AND COMMUNITY SERVICE**Manuscript reviewer** Jan 2018- Present*Proceedings of the National Academy of Science, U.S.A* (National Academy of Science)*Journal of Fish Biology**Molecular Biology and Evolution* (Society of Molecular Biology and Evolution)**Co-founder and Executive Director** Mar. 2017- July 2019eParliament ([www.eparliament.ca](http://www.eparliament.ca))

- *I led a new non-profit to make peer-reviewed research accessible to everyone*

**President** Mar. 2013- Mar. 2016

University of Toronto Secular Alliance

- *Conceptualized, developed, and moderated academic seminars on Science and Religion*