

PETER JOSEPH FLYNN

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EDUCATION

University of Chicago

PhD Candidate in Evolutionary Biology

Advisor: Dr. Corrie Moreau

Dissertation: Redefining the expanding diversity and co-evolutionary patterns in viral and bacterial communities within ants

College Teaching Certificate, Spring 2021

Chicago, IL

Current GPA: 4.00

Expected graduation: June 2022

Yale University

Bachelor of Science in Ecology and Evolutionary Biology, 2014

New Haven, CT

Cumulative GPA: 3.63

PUBLICATIONS

9. **Flynn, P. J.**, Salmier, A., Duplais, C., Lavergne, A., and Moreau, C.S. *In Prep.* Exploring the unprecedented diversity and co-evolutionary patterns within the ant virosphere.
8. **Flynn, P. J.**, D'Amelio, C., Russell, J.A., and Moreau, C.S. (2021), Localization of bacterial communities in gut compartments across *Cephalotes* turtle ants. *Applied and Environmental Microbiology*, 87(8): e02803-20. doi:10.1128/AEM.02803-20
7. **Flynn, P. J.** and Moreau, C.S. (2019), Assessing the diversity of endogenous viruses throughout ant genomes. *Frontiers in Microbiology*, 10: 1139. doi:10.3389/fmicb.2019.01139
6. Dennis, P.W.*, **Flynn, P. J.***, de Souza, W.M., Singer, J.B., Moreau, C.S., Wilson, S.J. and Gifford, R.J. (2018), Insights into circovirus host range from the genomic fossil record. *Journal of Virology*, 92(16): 1-9. doi:10.1128/JVI.00145-18 *authors contributed equally
5. Queenan A.M., Dowling D.J., Cheng, W.K., Fae, K., Fernandez J., **Flynn, P.J.**, Joshi S., Brightman, S.E., Ramirez J., Serroyen, J., Wiertsema S., Fortanier, A., van den Dobbelsteen, G., Levy, O., and Poolman, J. (2018). Increasing FIM2/3 antigen-content improves efficacy of Bordetella pertussis vaccines in mice in vivo without altering vaccine-induced human reactivity biomarkers in vitro. *Vaccine*, 37(1): 80-89. doi:10.1016/j.vaccine.2018.11.028
4. Sanchez-Schmitz, G., Stevens, C.R., Bettencourt, I.A., **Flynn, P.J.**, Schmitz-Abe, K., Metser G., Hamm D., Jensen, K.J., Benn, C., and Levy, O. (2018). Microphysiologic human tissue constructs reproduce autologous age-specific BCG and HBV primary immunization in vitro. *Frontiers in Immunology*, 9: 1-19 doi:10.3389/fimmu.2018.02634
3. **Flynn, P. J.** (2017), Digest: Using transcriptomics to map parental care behavior in burying beetles. *Evolution*, 71(8): 2132-2133. doi:10.1111/evo.13301
2. Percy, A, Gibson, M, Balmagia, J, Berkey, J, **Flynn, P.** and Viljoen, S. (2013). Disturbance effects on a South African river and the impact on the Mutale River *Crocodylus niloticus* population. *Proceedings of the 22nd Working Meeting of the IUCN-SSC Crocodile Specialist Group*. IUCN: Gland, Switzerland. pgs 186-191 2013 Proceedings
1. **Flynn, P. J.** (2012). "Zaglossus bartoni" (On-line), Animal Diversity Web. animaldiversity.org/Zaglossus-bartoni

SELECTED TALKS

9. **Flynn, P.J.** 'A comparative evolutionary analysis of endogenous viruses throughout Insecta'. Grainger Bioinformatics Center Annual Symposium; Virtual. January 10, 2021. Presentation.
8. **Flynn, P.J.**, D'Amelio, C., Russell, J.A., and Moreau, C.S. 'Localization of bacterial communities in gut compartments across *Cephalotes* ants'. Entomology Meeting 2020; Virtual. November 17, 2020. Presentation.
7. **Flynn, P.J.**, D'Amelio, C., Russell, J.A., and Moreau, C.S. 'Localization of bacterial communities in gut compartments across *Cephalotes* ants'. Society of Systematic Biologists Standalone Meeting 2020; Gainesville, Florida. January 4, 2020. Poster.

6. **Flynn, P.J.**, D'Amelio, C., Russell, J.A., and Moreau, C.S. 'Localization of bacterial communities in gut compartments across *Cephalotes* ants'. Evolution Meeting 2019; Providence, Rhode Island. June 22, 2019. Presentation.
5. **Flynn, P.J.**, 'Lightning Talk: Understanding the Viromes of Ants'. 4th Annual Viromics Workshop 2019; Columbus, Ohio. May 7, 2019. Presentation.
4. **Flynn, P.J.** 'Comparative assessment of endogenous viruses throughout ant genomes'. Entomological Society of America Meeting 2018; Vancouver, BC Canada. November 10, 2018. Presentation.
3. **Flynn, P.J.** 'Comparative assessment of endogenous viruses throughout ant genomes'. Presentation at Pasteur Institute of French Guiana Seminar Series; Cayenne, French Guiana. April 1, 2018. Presentation.
2. Sanchez-Schmitz, G., and **Flynn, P. J.** (2016). 'In Vitro Vaccination Of A Microphysiologic Human Tissue-Construct'. Judah Folkman Research Day, Boston, MA. Poster and Presentation.
1. **Flynn, P. J.**(2014). 'The Phylogeographic patterns of *Ixodes scapularis* populations throughout the Northeastern United States'. Senior Symposium, New Haven, CT. Presentation.

GRANTS, FELLOWSHIPS, AND HONORS

University of Chicago Henry Hinds Fund Award (\$2500), 2021
 William Rainey Harper Fellowship Nominee, 2021
 Grainger Bioinformatics Center at the Field Museum Award (\$6375), 2020
 NSF Graduate Research Fellowship (\$138,000), 2016-2020
 Pritzker Lab at the Field Museum Research Award (\$4000), 2019
 OSU Travel Award: Viromics Workshop (\$500), 2019
 University of Chicago, Evolutionary Biology Summer Travel Award (\$1400), 2018
 University of Chicago Henry Hinds Fund Award (\$2500), 2018
 University of Chicago, Evolutionary Biology Summer Travel Award (\$1250), 2017
 Pritzker Lab at the Field Museum Research Award (\$4000), 2017
 Boston Children's Hospital On-the-Spot Recognition Award (\$500), 2016
 NSF International Research Experience for Students Research Fellowship (\$2500), 2014

RESEARCH EXPERIENCES

PhD Candidate in Committee on Evolutionary Biology Sept 2016-present
 University of Chicago, Chicago, IL

- Investigating the role of viral and bacterial microbes in ants using an integrative approach to explore the factors that structure microbial communities through comparative genomics, NGS techniques, and evolutionary analyses. To do this, I am exploring endogenization of viruses within ant genomes, examining viral and bacterial communities within Neotropical ants along a fragmented gradient, and assessing fine-scale bacterial communities within the digestive tract of a specific group of ants.
- Learned several computer languages including Python, R, Unix, and Bash to aid in my analyses.

Research Assistant in Levy Laboratory June 2014-June 2016
 Boston Children's Hospital, Boston MA

- Researched innate and adaptive immune mechanisms of newborns and adults using a microphysiological in vitro model system. We discovered that this in vitro model system mimics human newborn mimics human newborn responses to immunization with HBV and BCG vaccines.
- Achieved fluency in laboratory techniques including ELISA, cell culture, phlebotomy, and flow cytometry.

Undergraduate Researcher in Diuk-Wasser Laboratory Sept 2013-May 2014
 Yale University, New Haven CT

- Examined eco-epidemiological factors of tick-borne diseases and the phylogeography of *Ixodes scapularis* in the Northeastern US. We found high levels of genetic diversity at a regional scale with evidence of a recent geographic expansion throughout the Northeast.
- Mastered molecular biology techniques including qPCR and RT-PCR and software including Geneious, MEGA, MacClade and GIS.

Resident Ecologist Intern in Kruger National Park May 2013-August 2013
 Skukuza, South Africa

- Investigated community ecology and wildlife management in Kruger National Park for the summer through the International Research Experience for Students Program.
- Performed independent research project on bat species diversity and vegetation structure within Kruger National Park. I discovered that there is a relationship between bat guild composition and large-scale vegetation structure.

Undergraduate Researcher in Near Laboratory

Jan 2011-Jan 2013

Yale University, New Haven CT

- Researched the phylogeography of *Lepomis megalotis* throughout the US. We found no phylogenetic differences among the geographic variants of *L. megalotis*.
- Learned molecular genetic techniques including DNA extraction, DNA sequencing, PCR, and software skills including PAUP*, JMP, and MrBayes.

TEACHING EXPERIENCE

Winter 2022 – Teaching Assistant for *Biological Evolution* at UChicago

Autumn 2021 – Field Course Teaching Assistant for *Ecology and Conservation* at UChicago

Spring 2021 – College Teaching Certificate from UChicago Teaching Center

Autumn 2020 – Teaching Assistant for *Ecology and Conservation* at UChicago

Autumn 2019 – Teaching Assistant for *Introductory Entomology* at UChicago

VOLUNTEER WORK AND OUTREACH

Committee on Evolutionary Biology Graduate Student Admissions, 2021-present, *PhD Student Representative*

Indiana Dunes Learning Center, Citizen Science, 2021-present, *Resident Scientist*

Darwin Cluster Keystone Mentor Program, 2020-present, *Mentor*

CEB DEI Committee, 2020-present, *Member*

UChicago LGBT Mentorship Program, *Mentor* 2018-present

UChicago Biological Sciences Diversity Committee, *Member* 2017-present

Dozin' with the Dinos at the Field Museum, *Presenter Scientist* 2017-present

LGBT at the Field Museum Group, 2016-present, *Working Group*

Meet-A-Scientist at the Field Museum, 2016-present, *Volunteer*

LGBT OStem at the University of Chicago, 2016-present *Member*

Journal of Emerging Investigators, 2015-2017 *Mentor*

WORKSHOPS

Inclusive Pedagogy Workshop Series, 2020

Fundamentals of Teaching in Science and Engineering Workshop Series, 2018-2020

OSU 4th Annual Viromics Workshop, 2019

Ant Course: French Guiana, 2018

Viral Bioinformatics & Genomics Training Course at the University of Glasgow, 2017

Computational Biology at the Field Museum Workshop, 2017

Marine Biological Laboratories Quantitative Biology Bootcamp, 2016

MEMBERSHIPS

International Union for the Study of Social Insects, North American Section

American Society for Microbiology

Society of Systematic Biologists

Field Museum Women in Science

Society for the Study of Evolution

Entomological Society of America

REVIEWED JOURNALS

Environmental Microbiology

Current Opinion in Insect Science

Frontiers in Microbiology
Journal of Evolutionary Biology
The Science of Nature (Naturwissenschaften)

SKILLS

Languages & Software: R, Bash (Command Line), Python, FigTree, BEAST, MrBayes, Mesquite, GIS, PhyloSeq, ggplot2, Vegan, Geneious, MEGA, QIIME2, RAxML, GitHub, Viromic and Microbial Bioinformatic Pipelines

Lab Skills: molecular biology techniques (PCR, qPCR, RT-PCR, DNA/RNA extraction), protein analysis (immunoblotting), high throughput sequencing techniques (shotgun metagenomic, 16S rRNA amplicon, RNA-Seq), ELISA, cell culture, and flow cytometry

REFERENCES

Dr. Corrie Moreau

Martha N. and John C. Moser Professor of Arthropod Biosystematics and Biodiversity, Cornell University
corrie.moreau@cornell.edu

Dr. Maureen Coleman

Associate Professor, Department of the Geophysical Sciences, University of Chicago
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Dr. Cathy Pfister

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