

# Philipp Ross

Postdoctoral Scholar

University of Chicago

Pritzker School of Molecular Engineering

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## Education

### Doctor of Philosophy with Biochemistry Emphasis in Genetics, Genomics, & Systems Biology

University of Chicago, IL USA

Oct. 2016 - Jan. 2023

### Bachelors of Science in Bioengineering

Cum laude | Binghamton University, Binghamton, NY USA

Sep. 2008 - May 2013

## Research Experience

### Postdoctoral scholar

2023 - Present

### Protein Engineering, University of Chicago

**Advisor:** Dr. Juan Mendoza

As a postdoctoral scholar, I used structural approaches such as Cryo-EM to engineer cytokines and their receptors such that they have enhanced potency and reduced side effects.

### Graduate student

2017 - 2023

### Molecular Immunology, University of Chicago

**Advisor:** Dr. Erin Adams

As a graduate student, I used cellular, biochemical, and structural methods to understand how archaic and non-classical MHCs present peptides and interact with innate and adaptive immune cells in humans.

### Computational biologist

2013 - 2016

### Computational Biology, Pennsylvania State University

**Advisor:** Dr. Manuel Llinás

As a technician, I designed and utilized bioinformatic workflows to understand pre- and post-transcriptional regulation in the deadliest human infecting species of the parasite that causes malaria, *Plasmodium falciparum*.

### Undergraduate researcher

2012 - 2013

### Mathematical Modeling, Binghamton University

**Advisor:** Dr. Hiroki Sayama

As an undergraduate student, I designed a computational simulation and graphical user interface looking at the socioeconomic consequences of the widespread adoption of 3D printers implemented in Mathematica and Python.

## Funding, Fellowships, & Scholarships

2021 - 2026	<b>R01 Grant Award Recognition</b> , Contributor <b>PI:</b> Dr. Erin Adams <b>Project Title:</b> Molecular and functional investigation of the role of HLA-F in immune regulation
2020 - 2021	<b>R21 Grant Award Recognition</b> , Contributor <b>PI:</b> Dr. Erin Adams <b>Project Title:</b> Molecular characterization of the functional isoforms of HLA-F in human health and cancer
2020	<b>Not Awarded, F31 Predoctoral Fellowship</b> Score: 32 Percentile: 23 <b>Title:</b> Molecular mechanisms of HLA-F recognition at the maternal-fetal interface
2019	<b>Not Awarded, R.C. Lewontin Early Award</b> <b>Title:</b> HLA-F, a non-classical MHC, in immunity, reproduction, and human evolution
2018	<b>Honorable Mention, NSF GRFP</b> <b>Title:</b> HLA-F, a non-classical MHC, in immunity, reproduction, and human evolution
2009 - 2010	<b>SMART Grant</b> , Binghamton University
2008	<b>Kathleen Mallory Memorial Scholarship</b> , Earl L. Vandermeulen High School

## Awards & Honors

2013	<b>Graduated Cum Laude</b> , Bachelors of Science in Bioengineering, Binghamton University
2013	<b>Member</b> , Tau Beta Pi Engineering Honor Society

## Manuscripts in Preparation

**Philipp Ross**, Hugo Hilton, Jane Lodwick, Tomasz Slezak, Lisbeth A. Guethlein, Curtis P. McMurtrey, Alex S. Han, Morten Nielsen, Daniel Yong, Kristof T. Nolan, William H. Hildebrand, Minglei Zhao, Anthony Kossiakoff, Peter Parham, Erin J. Adams “*The unique peptidome and structure of the archaic HLA-B allele, HLA-B\*73:01.*”

Kristof Nolan, **Philipp Ross**, Tomasz Slezak, Anthony Kossiakoff, Erin J. Adams “*Various HLA-F conformers are expressed on the surface of cells.*”

## Journal Publications

Lia Chappell, **Philipp Ross**, Lindsey Orchard, Timothy J Russell, Thomas D Otto, Matthew Berriman, Julian C Rayner, Manuel Llinás “*Refining the transcriptome of the human malaria parasite Plasmodium falciparum using amplification-free RNA-seq*” **BMC Genomics** 2020 <https://doi.org/10.1186/s12864-020-06787-5>

## Journal Publications (continued)

Munir Akkaya, Abhisheka Bansal, Patrick W Sheehan, Mirna Pena, Alvaro Molina-Cruz, Lindsey M Orchard, Clare K Cimperman, Chen-Feng Qi, **Philipp Ross**, Takele Yazew, Daniel Sturdevant, Sarah L Anzick, Girija Thiruvengadam, Thomas Dan Otto, Oliver Billker, Manuel Llinás, Louis H Miller, Susan K Pierce “A single-nucleotide polymorphism in a *Plasmodium berghei* ApiAP2 transcription factor alters the development of host immunity” **Science Advances** 2020 <https://doi.org/10.1126/sciadv.aaw6957>

Joana Mendonca Santos, **Philipp Ross\***, Gabrielle Josling\*, Preeti Joshi, Lindsey Orchard, Tracey Campbell, Ariel Schieler, Ileana M Cristea, Manuel Llinás “Red blood cell invasion by the malaria parasite is coordinated by the PfAP2-I transcription factor” **Cell Host & Microbe** 2017 <https://doi.org/10.1016/j.chom.2017.05.006>

Shiri Eshar, Lindsey Altenhofen, Alona Rabner, **Philipp Ross**, Yair Fastman, Yael Mandel-Gutfreund, Rotem Karni, Manuel Llinás, Ron Dzikowski “PfSR1 controls alternative splicing and steady-state RNA levels in *Plasmodium falciparum* through preferential recognition of specific RNA motifs” **Molecular microbiology** 2015 <https://doi.org/10.1111/mmi.13007>

Amber Ferger, Wai Lau, **Philipp Ross**, Wyman Zhao, Hiroki Sayama, Steen Rasmussen “Impact of Personal Fabrication Technology on Social Structure and Wealth Distribution: An Agent-Based Simulation Study” **MIT Press** 2013

## Conferences, Seminars

Virtual Talk, “Molecular mechanisms of HLA-F recognition at the maternal-fetal interface” Maternal/Fetal Interface Seminar Series (Oct. 2020)

Poster “The unique peptidome and structure of the archaic HLA-B allele, HLA-B\*73:01” UChicago Molecular Biosciences Retreat (Oct. 2019)

Talk “HLA-F, a non-classical MHC, in immunity, reproduction, and human evolution” UChicago Molecular Biosciences Retreat (Oct. 2019)

## Service

2020 - Present	<b>Graduate student and Postdoc Advisor</b> , UChicago iGEM (GeneHackers)
2019 - 2021	<b>Graduate Program Student Representative</b> , Deans Council, University of Chicago
2017 - 2019	<b>Science Connections Volunteer</b> , Museum of Science and Industry
2017 - Present	<b>Resident Scientist</b> , Skype a Scientist ( <a href="http://www.skypeascientist.com">http://www.skypeascientist.com</a> )
2017	<b>Judge</b> , Spring Symposium & Student Research Conference in STEM
2011 - 2012	<b>President &amp; Founder</b> , Entrepreneurship Club, Binghamton University
2010 - 2011	<b>President</b> , Binghamton Bioengineering Club, Binghamton University

## Teaching & Mentorship

2019 - 2021

### **Undergraduate mentor**

**Mentee:** Daniel Yong

I mentored and worked with Daniel to structurally characterize a rare MHC molecule known as HLA-B\*73:01, a project which will lead to a co-author publication.

2019

### **T.A. - Evolution of Biological Molecules**

**Instructors:** Dr. Joe Thornton & Dr. Allan Drummond

University of Chicago

2017

### **T.A. - Genetic Analysis of Model Organisms**

**Instructors:** Dr. Doug Bishop, Dr. Jocelyn Malamy, & Dr. Edwin (Chip) Ferguson

University of Chicago