

Katarina Marie Braun

Curriculum vitae

University of Wisconsin-Madison
Medical Scientist Training Program
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I. Background

Education

2014-2022, Medical Scientist Training Program (MSTP), University of Wisconsin-Madison

MD, University of Wisconsin School of Medicine and Public Health, anticipated May 2022

PhD, University of Wisconsin-Madison, Cellular and Molecular Biology, May 2021

Thesis title: "Embracing randomness: within- and between-host evolution in two RNA viruses", Dr. Thomas C. Friedrich laboratory

2010-2014, University of Wisconsin-Madison

BS, Evolutionary Biology & Anthropology, with comprehensive honors

Honors & Awards

Alpha Omega Alpha Honor Medical Society member (2021)

NIH NIAID F30 fellowship awardee, "Defining the role of genetic drift in within-host influenza evolution" F30 AI145182. Overall impact score = 10. (2020 - 2022)

Rath Distinguished Graduate Research Fellowship (2014 - 2019)

Student Research Grant Competition (SRGC) recipient (2019)

Cellular and Molecular Biology travel grant awardee (2019)

University of Wisconsin-Madison MSTP travel grant awardee (2019)

Woods Hole Workshop on Molecular Evolution graduate (2018)

Comprehensive honors in biology and liberal arts, University of Wisconsin-Madison (2014)

Mathea and Helen Lawless Louis Mollere Medicine Fund Scholarship (2014)

University of Wisconsin-Madison Senior Honors Thesis Scholarship (2013)

American Society for Neural Therapy and Repair travel grant awardee (2013)

University of Wisconsin-Madison Welton Honors Summer Sophomore Research Apprenticeship Scholarship (2012)

II. Research accomplishments

Peer-reviewed publications

1. Dustin W. Currie*, Gage K. Moreno*, Miranda J. Delahoy, Ian W. Pray, Amanda Jovaag, **Katarina M. Braun**, Devlin Cole, Todd Shechter, Geroncio Fajardo, Brian Yandell, Steve Goldstein, Dena Bushman, Hannah Segaloff, Patrick Kelly, Collin Pitts, Christin Lee, Katarina Grande, Amanda Kita-Yarbro, Brittany Grogan, Sara Mader, Jake Baggot, Al Bateman, Ryan Westergaard, Jacqueline E. Tate, Thomas C. Friedrich, Hannah L. Kirking, David H. O'Connor, Marie E. Killerby. **Interventions to Disrupt Coronavirus Disease Transmission at a University, Wisconsin, USA, August–October 2020.** *Emerging Infectious Diseases*. September 2021.
2. **Katarina M. Braun***, Gage K. Moreno*, Ashley Buys, Max Bobholz, Molly A. Accola, Laura Anderson, William R. Rehrauer, David A. Baker, Nasia Safdar, Alexander J. Lepak, David H. O'Connor, Thomas C. Friedrich. **Viral Sequencing to Investigate Sources of SARS-CoV-2 Infection in US Healthcare Personnel.** *Clinical Infectious Diseases*. September 2021.
3. Jonathan L. Temte, Shari Barlow, Emily Temte, Maureen Goss, Kelsey Florek, **Katarina M. Braun**, Thomas C. Friedrich, Erik Reisdorf, Allen C. Bateman, Ara Uzicanin. **Evidence of Early Household Transmission of SARS-CoV-2 Involving a School-aged Child.** *Wisconsin Medical Journal*. August 2021.
4. **Katarina M. Braun***, Gage K. Moreno*, Cassia Wagner, Molly A. Accola, William M. Rehrauer, David A. Baker, Katia Koelle, David H. O'Connor, Trevor Bedford, Thomas C. Friedrich, Louise Moncla. **Acute SARS-CoV-2 infections harbor limited within-host diversity and transmit via tight transmission bottlenecks.** *PLoS Pathogens*. August 2021.
5. Gage K. Moreno*, **Katarina M. Braun***, Ian W. Pray, Hannah E. Segaloff, David A. Baker, Ailam Lim, Keith Poulsen, Jonathan Meiman, Ryan P. Westergaard, Michael K. Moll, Thomas C. Friedrich, David H. O'Connor. **Severe Acute Respiratory Syndrome Coronavirus 2 Transmission in Intercollegiate Athletics Not Fully Mitigated With Daily Antigen Testing.** *Clinical Infectious Diseases*. July 2021.
6. Chelsea M. Crooks, Andrea M. Weiler, Sierra L. Rybarczyk, Mason Bliss, Anna S. Jaeger, Megan E. Murphy, Heather A. Simmons, Andres Mejia, Michael K. Fritsch, Jennifer M. Hayes, Jens C. Eickhoff, Ann M. Mitzey, Elaina Razo, **Katarina M. Braun**, Elizabeth A. Brown, Keisuke Yamamoto, Phoenix M. Shepherd, Amber Possell, Kara Weaver, Kathleen M. Antony, Terry K. Morgan, Christina M. Newman, Dawn M. Dudley, Nancy Schultz Darken, Eric Peterson, Leah C. Katzelnick, Angel Balmaseda, Eva Harris, David H. O'Connor, Emma L. Mohr, Thaddeus G. Golos, Thomas C. Friedrich, Matthew T. Aliota. **Previous exposure to dengue virus is associated with increased Zika virus burden at the maternal-fetal interface in rhesus macaques.** *PLoS Neglected Tropical Diseases*. July 2021.
7. Chelsea M. Crooks, Andrea M. Weiler, Sierra L. Rybarczyk, Mason Bliss, Anna S. Jaeger, Megan E. Murphy, Heather A. Simmons, Andres Mejia, Michael K. Fritsch, Jennifer M. Hayes, Jens C. Eickhoff, Ann M. Mitzey, Elaina Razo, **Katarina M. Braun**, Elizabeth A. Brown, Keisuke Yamamoto, Phoenix M. Shepherd, Amber Possell, Kara Weaver, Kathleen M. Antony, Terry K. Morgan, Dawn M. Dudley, Eric Peterson, Nancy Schultz-Darken, David H. O'Connor, Emma L. Mohr, Thaddeus G. Golos, Matthew T. Aliota, Thomas C. Friedrich. **African-Lineage Zika Virus Replication Dynamics and Maternal-Fetal Interface Infection in Pregnant Rhesus Macaques.** *Journal of Virology*. July 2021.

8. Kasen K. Riemersma, Anna S. Jaeger, Chelsea M. Crooks, **Katarina M. Braun**, James Weger-Lucarelli, Gregory D. Ebel, Thomas C. Friedrich, Matthew T. Aliota. **Rapid evolution of enhanced Zika virus virulence during direct vertebrate transmission chains.** *Journal of Virology*. March 2021.
9. **Katarina M. Braun***, Gage K. Moreno*, Peter J. Halfmann, David A. Baker, Emma Boehm, Andrea Weiler, Amelia K. Haj, Yoshihiro Kawaoka, Katia Koelle, David H. O'Connor, Thomas C. Friedrich. **Transmission of SARS-CoV-2 in domestic cats imposes a narrow bottleneck.** *PLoS Pathogens*. February 2021.
10. Anna S. Heffron*, **Katarina M. Braun***, Cora Allen-Savietta, Amarette Filut, Chelsea Hanewall, Anna Huttenlocher, Jo Handelsman, Molly Carnes. **Gender can influence student experiences in MD-PhD Training.** *Journal of Women's Health*. January 2021.
11. Gage K. Moreno*, **Katarina M. Braun***, Kasen K. Riemersma*, Michael A. Martin, Peter J. Halfmann, Chelsea M Crooks, Trent Prall, David Baker, John J. Baczenas, Anna S. Heffron, Mitchell Ramuta, Manjeet Khubbar, Andrea M. Weiler, Molly A. Accola, William M Rehrauer, Shelby L. O'Connor, Nasia Safdar, Caitlin S. Pepperell, Trivikram Dasu, Sanjib Bhattacharyya, Yoshihiro Kawaoka, Katia Koelle, David H. O'Connor, Thomas C. Friedrich. **Viral sequence data reveal fine-scale spatiotemporal heterogeneities in SARS-CoV-2 introduction and spread.** *Nature Communications*. November 2020.
12. Nasia Safdar, Gage K. Moreno, **Katarina M. Braun**, Thomas C. Friedrich, David H. O'Connor. **Using Virus Sequencing to Determine Source of SARS-CoV-2 Transmission for Healthcare Worker.** *Emerging Infectious Diseases*. October 2020.
13. **Katarina M. Braun***, Thomas C. Friedrich. **Influenza evolution with little host selection.** *Nature Ecology and Evolution – News and Views article*. January 2019.
14. Kelsey R. Florek, Luiza M. Campos, **Katarina M. Braun**, Huong Q. McLean, Jennifer P. King, Brendan Flannery, Edward A. Belongia, Thomas C. Friedrich. **An updated influenza A(H3N2) vaccine generates limited antibody responses to previously encountered antigens in children.** *Vaccine*. January 2018.
15. Corinna A. Jones, Mary K. Duffy, Sarah A. Hoffman, Nancy J. Schultz-Darken, **Katarina M. Braun**, Michelle R. Cucci, Marina E. Emborg. **Vocalization development in common marmosets for neurodegenerative translational modeling.** *Neurological Research*. February 2018.
16. Scott C. Vermilyea, Scott Guthrie, Michael Meyer, Kim Smuga-Otto, **Katarina M. Braun**, Sara Howden, James A. Thomson, Su-Chun Zhang, Marina E. Emborg, Thaddeus G. Golos. **Induced pluripotent stem cell-derived dopaminergic neurons from adult common marmoset fibroblasts.** *Stem Cells and Development*. 2017 Sep 1;26(17):1225-35.
17. Nancy Schultz-Darken, **Katarina M. Braun**, Marina E. Emborg. **Neurobehavioral development in common marmoset monkeys.** *Developmental Psychobiology*. March 2016.
18. **Katarina M. Braun***, Nancy Schultz-Darken, Mary Schneider, Colleen F. Moore, Marina E. Emborg. **Development of a novel postnatal neurobehavioral scale for evaluation of common marmoset monkeys.** *American Journal of Primatology*. April 2015.

* indicates first author

Manuscripts submitted and/or under review

1. Peter J. Halfmann, Makota Kuroda, Tammy Armbrust, James Teiler, Ariane Balaram, Gage K. Moreno, Molly A. Accola, Riccardo Valdez, Theresa Kowalski-Dobson, **Katarina M. Braun**, Siya Yamayoshi, Elizabeth Somsen, John J. Baczenas, Matthew McLaughlin, William Rehrauer, Masaki Imai, Thomas C. Friedrich, Shelby L. O'Connor, David H. O'Connor, Aubree Gordon, Bette Korber, Yoshihiro Kawaoka. **Characterization of the emerging SARS-CoV-2 B.1.621 (Mu) Variant.** *Under review at Scientific Translational Medicine.*
2. Katherine A. Amato, Luis A. Haddock III, **Katarina M. Braun**, Victoria Meliopoulos, Brandi Livingston, Rebekah Honce, Grace A. Schaack, Emma Boehm, Christina A. Higgins, Gabrielle L. Barry, Katia Koelle, Stacey Schultz-Cherry, Thomas C. Friedrich, Andrew Mehle. **Influenza A virus undergoes compartmentalized replication in vivo dominated by stochastic bottlenecks.** *Submitted to Nature Microbiology.*

Preprint publications

1. Gage K. Moreno*, **Katarina M. Braun***, Peter J. Halfmann, Trent M. Prall, Kasen K. Riemersma, Amelia K. Haj, Joseph Lalli, Kelsey R. Florek, Yoshihiro Kawaoka, Thomas C. Friedrich, David H. O'Connor. **Limited SARS-CoV-2 diversity within hosts and following passage in cell culture.** *bioRxiv.* April 2020.
2. Courtney L. Finch, Ian Crozier, Ji Hyun Lee, Russ Byrum, Timothy K. Cooper, Janie Liang, Kaleb Sharer, Jeffrey Solomen, Philip J. Sayre, Gregory Kocher, Christopher Bartos, Nina M. Aios, Marcelo Castro, Peter A. Larson, Ricky Adams, Brett Beitzel, Nicholas Di Paolo, Jeffrey R. Kugelman, Jonathan R. Kurtz, Tracey Burdette, Martha C. Nason, Irwin M. Feuerstein, Gustavo Palacios, Maris C. St. Claire, Matthew G. Lackemeyer, Reed F. Johnson, **Katarina M. Braun**, Mitchell D. Ramuta, Jiro Wada, Connie S. Schmaljohn, Thomas C. Friedrich, David H. O'Connor, Jens H. Kuhn. **Characteristic and quantifiable COVID-19-like abnormalities in CT- and PET/CT-imaged lungs of SARS-CoV-2-infected crab-eating macaques (*Macaca fascicularis*).** *bioRxiv.* May 2020.

* indicates first author

Oral research presentations

- 2021 "Limited within-host diversity and tight transmission bottlenecks limit SARS-CoV-2 evolution in acutely infected individuals"
ISIRV-WHO Virtual Conference: COVID-19, Influenza and RSV: Surveillance-Informed Prevention and Treatment, virtual talk (October 2021)
- 2020 "SARS-CoV-2 in two Wisconsin communities, on campus, and in healthcare workers"
University of Wisconsin-Madison, Medical Scientist Training Program Seminar series, virtual talk (November 2020)
- 2020 "Distinct patterns of SARS-CoV-2 transmission in two nearby communities in Wisconsin, USA"
International AIDS Society COVID-19 Conference, virtual talk (July 2020)
- 2020 "Sequencing SARS-CoV-2 to characterize viral dynamics within and between domestic cats"

- COVEN group, virtual talk (October 2020)
- 2019 “*Stringent transmission bottlenecks constrain adaptation of H7N9 viruses to mammalian hosts*”
Wisc-e-Sota Virology Symposium, La Crosse, Wisconsin (September 2019)
- 2018 “*Gender and our MSTP*”
University of Wisconsin-Madison, Medical Scientist Training Program retreat, Green Lake, Wisconsin (September 2018)
- 2013 “*Neurodevelopment in Common Marmoset Monkeys (Callithrix jacchus) and its application to transgenesis*”
American Society for Neural Therapy and Repair Conference, Clearwater Beach, Florida (April 2013)

Poster presentations (presenting author)

- 2021 “*Limited within-host diversity and tight transmission bottlenecks limit SARS-CoV-2 evolution in acutely infected individuals*”
ISIRV-WHO Virtual Conference: COVID-19, Influenza and RSV: Surveillance-Informed Prevention and Treatment (October 2021)
- 2020 “*Quantifying influenza virus transmission bottlenecks via molecular barcoding*”
39th Annual American Society for Virology Meeting, cancelled due to COVID-19 (June 2020)
- 2019 “*Stringent transmission bottlenecks constrain adaptation of H7N9 to mammalian hosts*”
Options X for the Control of Influenza, Singapore, Singapore (September 2019)
- 2019 “*Striving for greater gender equity in one MSTP: A framework for stemming the leaky pipeline*”
American Physician Scientist Association, Chicago, Illinois (April 2019)
- 2017 “*Approaches to improve the accuracy of SNP frequency and population size estimates in deep sequencing analyses of viral populations*”
University of Wisconsin-Madison, Medical Scientist Training Program Symposium, Madison, Wisconsin (April 2017)

Poster presentations (contributing author)

- 2021 “*Gender Can Influence Student Experiences in MD-PhD Training*”
National MD/PhD DEI Summit, virtual conference, (July 2021)
- 2021 “*Quantifying influenza virus transmission bottlenecks via molecular barcoding*”
American Society of Virology Annual conference, virtual conference (July 2021)
- 2020 “*Comparing the SARS-CoV-2 outbreaks in Dane County and the greater Milwaukee area, Wisconsin*”

- International AIDS Society COVID-19 Conference, virtual conference (July 2020)
- 2020 “*Prior dengue immunity may enhance Zika virus infection in the placenta in non-human primates*”
American Society of Tropical Medicine and Hygiene Annual Meeting, virtual conference (November 2020)
- 2020 “*Quantifying influenza virus diversity during infection and transmission using molecular barcodes*”
National Human Genome Research Institute Research Training and Career Development Annual Meeting, virtual conference (March 2020)
- 2020 “*Quantifying influenza virus transmission bottlenecks via molecular barcoding*”
American Society of Virology Annual conference, cancelled due to COVID-19
- 2016 “*Early development of common marmoset vocalizations*”
Society for Neuroscience, San Diego, California (November 2016)
- 2015 “*Common marmosets IPSC-derived midbrain floorplate neuroprogenitors*”
Society for Neuroscience, Chicago, Illinois (October 2015)

III. Professional development

Leadership & service

University of Wisconsin-Madison MSTP Admission Committee Member (2019 - 2021)

- Served on the MSTP admissions committee as student member for two admissions cycles. Reviewed applications materials, scored and interview applicants, participated in weekly admissions meetings, and sought to recruit female and minority students to the UW-MSTP in particular.

University of Wisconsin-Madison MSTP Executive Committee, Diversity and Outreach Co-Chair (2017 - 2020)

- Served as MSTP Executive Committee Diversity and Outreach co-chair for three academic years. Organized DEI journal clubs, dinners, and presentations. Recruited and coordinated outside speakers related to implicit bias and diversity, equity, and inclusion (DEI) efforts. Contributed to new MSTP curriculum on implicit bias. Co-led a project on the role of gender in MSTP education and experiences.

AIDS Vaccine Research Laboratories DEI Journal Club Leader (2019 - 2020)

- Co-founded and led a monthly graduate-student focused journal club on DEI efforts and implicit bias in science

University of Wisconsin Medical Scientist Training Program Peer Tutor (2017-2020)

- Regularly met with co-MSTP students to discuss challenges and provide support related to curriculum, MSTP transition points, choosing a lab, interpersonal challenges, etc. Participated in F30 preparation sessions to provide verbal and written feedback for students preparing and submitting NIH fellowships.

University of Wisconsin School of Medicine and Public Health MEDiC volunteer (2017 - present)

- Volunteered at various student-run free clinics around Madison to assist in providing care and coordinating social services for residents of Madison, WI.

University of Wisconsin School of Medicine and Public Health, American Medical Association Medical Student Section, UWSMPH Chapter Co-president (2016 - 2017)

- Co-led the UWSMPH American Medical Association (AMA) Medical Student Section (MSS) chapter. Organized regular group meetings, including resolution-writing workshops and policy brainstorming sessions.

University of Wisconsin School of Medicine and Public Health, American Medical Association Medical Student Section, Committee for Bioethics and Humanities (2015 - 2016)

- Served on the AMA-MSS for the Committee for Bioethics and Humanities. Researched and wrote position statements on various topics including pelvic exams on anesthetized patients and the ethical use of social media in medicine.

American Medical Association Medical Student Section Region 2 Delegate (2015)

- Served as a region 2 delegate at regional and national AMA-MSS meetings to vote on policy and provide testimony on various resolutions.

University of Wisconsin School of Medicine and Public Health, Internal Medicine Interest Group (IMIG) Student Leader (2015 - 2016)

- Co-led the IMIG. Organized multiple resident and fellow question-and-answer sessions as well as other sub-specialty informational sessions. Coordinated and distributed medical student resources.

University of Wisconsin School of Medicine and Public Health, Substance Abuse Task Force, Co-founder (2014)

- Co-founded the Substance Abuse Task Force at UWSMPH, an organization that worked on education related to improved opioid prescribing practices, opioid use contracts, and the safe and effective disposal of excess opioid medications.

Resolutions authored and presented at national AMA conferences:

- (1) "Support for the Use of Pain Contracts" adopted as AMA-MSS policy, A-2015.
- (2) "Banning the Sale of Sugar-Sweetened Beverages in Hospitals" adopted as AMA-MSS policy, I-2015.

Administrative and collective duties

Peer reviewer for academic journal(s)

- (1) Virus Evolution, 2021

Workshops

Workshop on Molecular Evolution, Marine Biological Laboratory, Woods Hole, Massachusetts (July 2018)

University of Wisconsin Biotechnology Center: Introduction to next generation sequence analysis, Linux essentials for next generation sequencing data analysis (September 2017)

Wisconsin Medical Society Annual Meeting Delegate for Student Caucus, Madison, Wisconsin (April 2016)

American Medical Association – Medical Student Section Annual Meeting, Served as Region 2 Delegate, Chicago, Illinois (June 2015)

American Medical Association – Medical Student Section Region 2 Meeting, Served as a UW School of Medicine Delegate, Omaha, Nebraska (February 2015)

American Medical Association – Medical Student Section Interim Meeting, Served as Region 2 Delegate, Dallas, Texas (November 2014)

Media

Hosted Senator Tammy Baldwin for visit to Friedrich and O'Connor Laboratories to discuss efforts to track COVID-19 variants in Wisconsin (2021)

- <https://news.wisc.edu/sen-tammy-baldwin-visits-uw-lab-tracking-covid-19-variants/>

The Badger Herald article “The Lab Report: Two UW labs in hot pursuit of tracking, surveilling COVID-19 variants” by Michaela Kihntopf (2021)

- <https://badgerherald.com/news/2021/03/02/the-lab-report-two-uw-labs-in-hot-pursuit-of-tracking-surveilling-covid-19-variants/>

Spectrumnews1 news story “Wisconsin Researchers, Doctors Say More COVID Variant Tracking Needed” by Jeff Dahdah (2021)

- <https://spectrumnews1.com/wi/milwaukee/news/2021/02/13/wisconsin-researchers--doctors-say-more-covid-variant-tracking-needed>

Council of Graduate Students article “GradImpact: Shifting Priorities to Combat a Pandemic” (2020)

- <https://cgsnet.org/gradimpact-shifting-research-priorities-combat-pandemic>

University of Wisconsin-Madison Grad School article “Coronavirus leads to insights on transmission, vaccine development” by Meghan Chua (2020)

- <https://grad.wisc.edu/2020/06/09/coronavirus-sequencing-leads-to-insights-on-transmission-vaccine-development/>

Spectrumnews1 news story “UW Researchers aim to understand and help fight coronavirus” by Jeff Dahdah (2020)

WUWM NPR radio story “COVID-19 pandemic means changes, uncertainty for university researchers in Wisconsin” by Chuck Quirnbach (2020)

- <https://www.wuwm.com/education/2020-07-28/covid-19-pandemic-means-changes-uncertainty-for-university-researchers-in-wisconsin>

Interviewed for background information. NYTimes – Jim Glanz. NYTimes Magazine – John Gertner. USA Today – Erin Mansfield. (2020)

NBC 15 story – “Safer at Home order reduced coronavirus spread, UW-Madison researchers say” by Elise Romas (2020)

- <https://www.nbc15.com/2020/11/07/safer-at-home-order-reduced-coronavirus-spread-uw-madison-researchers-say/>

Membership in professional societies

American College of Obstetricians and Gynecologists (2018 - current)

Society for the Study of Evolution (SSE) (2017 - current)

American Society for Virology (ASV) (2017 - current)

Infectious Disease Society of America (IDSA) (2016 - current)

American College of Physicians (ACP) (2015 - current)

American Medical Association - Medical Student Section (AMA-MSS) (2014 - current)

Wisconsin Medical Society (WMS) (2014 - current)

American Physician Scientist Association (APSA) (2012 - current)

IV. Mentorship

Luis Haddock, junior graduate student (2020-2021)

Luis is a graduate student who joined the Friedrich lab to gain experience in viral evolution. I oversaw Luis's lab rotation project assessing the diversity of barcoded influenza virus libraries, which has now become his primary thesis project. I oversaw his training in wet- and dry-lab techniques and continue to mentor him on scientific writing and data analysis.

Emma Boehm, undergraduate researcher (2018-2021)

Emma joined the Friedrich lab as a second-year undergraduate student hoping to gain research experience and to explore whether graduate school was the right path for her. I led her training in laboratory techniques, provided mentorship, and oversaw her project aimed at characterizing barcoded influenza virus libraries collected from ferret transmission experiments. Emma is now working as a research technician in Matthew Aliota's lab at the University of Minnesota.

Macy Pell, undergraduate researcher (2017-2019)

Macy joined the Friedrich lab as an undergraduate researcher to gain research experience and applying to graduate school. I led her training in laboratory techniques, provided mentorship, and oversaw her project aimed at identifying the extent to which influenza viral mixing occurs between the upper and lower respiratory tracts of mammals. Macy is currently a graduate student at Michigan State University.

UW MSTP Peer Mentor (2017-present)

I mentor junior students within the UW-MSTP. This role involves tutoring course material, providing guidance on preparations for clinical rotations, providing guidance for licensing exam studying, as well as providing support at the transition points within the program (e.g. from medical school to graduate school).