Graduate Program in Ecology, Evolution & Behavior
Application for Admission

Please copy and paste this application in a your preferred type of Word document to give you enough space to answer the questions. Once complete, save as a PDF before uploading to your application file.

Please fill in the following queries, paying attention to word limits where stated. If you have nothing to report for a particular box, just leave it empty.

Name: Michael Blazanin UT EID: **mb57828**

1. **Key Words of Research Interest:** List three to six Key-Words describing your research interests in biology:
   Experimental microbial evolution, coevolution, microbial communities

2. **Requested Professor(s):** Please visit our website https://cns.utexas.edu/eeb-graduate-program for a list of faculty in the Graduate Program of Ecology, Evolution & Behavior. State whether you would prefer to be advised by one professor in particular, or co-advised by two or more faculty, or if you prefer to rotate between labs before choosing a mentor. Then, list the professor(s) you would prefer to work with. For each, provide up to 3 sentences explaining your rationale in selecting that mentor.

   We strongly encourage prospective students to directly contact potential mentors to confirm mutual interests and determine whether the professor is taking new students. Indicate the names of any faculty with whom you have corresponded.

   I would prefer to rotate between labs before choosing a mentor, here are the professors I am most interested in working with:
   Jeffrey E. Barrick, Ph.D., have corresponded with. I am interested in Dr. Barrick because of his wide-ranging experimental evolution research with microbes. I am particularly interested in his pursuits of application of evolutionary ideas, as well as basic science questions.
   James Bull, Ph.D. I am interested in Dr. Bull because of his work with phages, an interest of mine following my work in the Travisano lab the past two years.
   Nancy Moran, Ph.D. I am interested in Dr. Moran because of her work on insect microbiomes. She has investigated a range of issues surrounding insect microbiomes that interest me, including coevolution and engineered microbial communities.
   Howard Ochman, Ph.D. I am interested in Dr. Ochman because his work using genomic approaches to study evolution appeals to me as a forward-thinking approach to a set of very old questions. The combination of experimental evolution and genomics can reveal dynamics previously invisible to observation.

3. **Prior Research Experience:** Describe your prior experience in research. You should explain the subject of the research, your role in that work, and specific skills you gained in the process. If this experience has guided your choice of future goals, explain how. Please keep your statement to less than 300 words.

Directed research, fall 2016, Dr. Michael Travisano, University of Minnesota. To demonstrate if motility enables predator-prey coexistence in a microbial community, am carrying out experimental evolution and phenotypic characterization.
NSF REU, summer 2016, Dr. Thomas Platt, Kansas State University. To investigate how cooperation is maintained in *Agrobacterium* plant pathogens, used experimental evolution and phenotypic assays to determine conditions and dynamics of maintenance of cooperation.
Undergraduate Research Opportunities Program Grant Recipient, spring 2016, Dr. Michael Travisano. Carried out experimental evolution and phenotypic measurements to show an evolutionary tradeoff between motility and resistance to predation in bacteria.
Directed research, fall 2015, Dr. Michael Travisano. Carried out pilot experiments to suggest tradeoffs in microbial predator-prey systems.
MnDRIVE Undergraduate Research Fellow, September 2015-May 2016, Dr. Satoshi Ishii, University of Minnesota. To understand chemical fluxes during denitrification, measured and modeled real-time concentrations.
Student Laboratory Technician, summer 2015, Dr. Deborah Ferrington, University of Minnesota. To better understand oxidative stress, carried out molecular biology protocols and managed human donor tissue bank database.
Undergraduate research project, spring 2015, Shantiluz Sanchez, VENUSA Institute. To describe ecosystem differences in Venezuela, measured plant biodiversity and morphology in several biomes.
Directed research, fall 2014, Dr. Michael Travisano. To determine how bacterial motility evolved with conflicting signals, assayed chemoattractant-specific motility.

4. **Prior Teaching Experience:** Describe any prior experience as a teacher, in formal or informal settings. Please keep your statement to less than 300 words.

For the past 18 months I have been employed as a Kaplan instructor, initially for the ACT and currently training to teach the GRE as well. As a Kaplan instructor, I prepare for each class session by reviewing the lesson plan for the day, identify potential practice problems and homework questions, respond to individual student questions and concerns, both in-class and remotely, and support students in their preparation.
I worked as an undergraduate teaching assistant in the fall semester of 2014, as well as for several weeks before and after the semester. Before and after the semester, I was involved in curriculum design, laboratory maintenance, organization and cleaning, and running pilot experiments. During the semester, I maintained laboratory stocks of various mixes and medias, trained enrolled undergraduates in laboratory techniques, and responded to student questions and concerns as they arose.
Finally, in January of 2014 and 2016 I served as a coach for the Bloomington, Minnesota Speech Team Congressional Debate participants. This position involved planning, preparing, and leading three to five sessions of debate preparation and mock debate, including providing individual feedback for participants based on the speeches they composed.

5. **Relevant Work Experience:** Describe any prior jobs you have held that are not already covered in your research or teaching experience statements, and which are relevant to your pursuit of a graduate degree. Please keep your statement to less than 300 words.

In August through September 2015 I worked as the Event Staff Captain for the University of Minnesota office of Orientation and First Year Programs. This office is responsible for the planning and execution of all the orientation and welcome week activities for each year's freshmen class, and I had previously volunteered with them. As Event Staff Captain, I was

responsible, along with another Captain, for managing and leading a group of 20 volunteers. We were responsible for managing much of the behind-the-scenes logistics, including attendance control and counts for large events, with attendance up to 4200. I also developed volunteer training materials and schedules. This experience is relevant to my pursuit of a graduate degree because it taught me valuable multi-tasking skills, how to manage multiple ongoing projects and tasks in parallel, how to effectively communicate and delegate tasks, and how to persevere through unexpected events.

6. **Research Goals:** Describe your research goals and interests for your graduate degree. What kinds of questions do you wish to answer, and why are these worth pursuing? Broadly speaking, how might you pursue those questions? Please keep your statement to less than 300 words.

The questions I am most interested in center around microbial evolution. One area of particular interest for me is the evolution of pathogenic organisms, whether that be viruses, bacteria, eukaryotic microbes, or anything else. What factors affect their evolutionary dynamics and outcomes? By understanding these answers, we can perhaps find new ways of combatting pathogens while turning evolutionary forces for our benefit. In a related topic, I have become very interested in coevolution, especially between antagonistic pairs (like competitors or predator-prey relationships). The reciprocal nature of these interactions leads to lots of complex outcomes, and their impact is widespread throughout the natural world. Finally, I am interested in microbial community evolution, either as a stand-alone community or as a microbiome. How do different members affect each other's evolution? How does a host affect the community, and vice-versa?

To study these questions, I am interested in both model and real-world systems. Model systems of general phenomena provide a more general answer to the sorts of results that can be observed. Model systems, especially with microbial evolution, are also often very plastic, allowing us to push the limits of what was thought possible. With such systems, I am especially engaged by experimental evolution approaches and with genomic approaches, as each complements the other. For more real-world systems, like studying ongoing pathogen evolution, genomic approaches are often the most tractable approach, and can help understand what is happening in the natural world, and can help inform how we respond.

7. **Career Goals:** The EEB graduate program at UT Austin has a strong track record of placing our PhD graduates into academic research and teaching positions, non-governmental organizations, government research and policy jobs, and the private sector. We seek to train our students for a diverse and ever-changing job market. Briefly describe your career goals and how PhD coursework and research in EEB would help you achieve those goals. Please keep your statement to less than 250 words.

After graduate school, I intend to continue a career in academic teaching and research, with the eventual goal of becoming a faculty member at a research institution, teaching while also directed a laboratory and leading research. I envision my research being focused on microbial evolution and how we can better understand it so that we can improve human welfare. PhD coursework and research in EEB would train me in solid scientific thinking. Through my experiences, I would learn how to design, set up, carry out, and analyze experiments in rigorous and valid ways to test hypotheses and answer scientific questions. It would also train me in the nuance of the scientific institution necessary for a successful career in scientific research. Skills like effective grant writing, effective scientific writing to publish findings, and how to interact meaningfully and productively with other scientists would be cultivated in this program, and would fuel my success in the future. Finally, this program in particular is ideal for me because

the ecological and evolutionary perspective is the one that most energizes me, and which I intend to pursue for the duration of my career. My gaining a solid understanding of how ecological and evolutionary thought and science is carried out, I can be fully prepared for a career of ecological and evolutionary biological research.

8. **Additional Statement:** Provide a brief OPTIONAL statement (150 word maximum) to address any topics not covered in the previous statements, that you feel the admissions committee should know about you when considering your application.

Honors & Awards:

National Science Foundation Research Experience for Undergraduates Travel Grant, $1000	Oct 2016
College of Biological Sciences Undergraduate Research Travel Grant, $500	Oct 2016
Astronaut Scholar, Astronaut Scholarship Foundation, $10,000	Jun 2016
University of Minnesota Churchill Scholarship Nominee	May 2016
Honorable Mention for Best Oral Presentation, Winchell Research Symposium	Apr 29, 2016
Monica Tsang and James Weatherbee College of Biological Sciences Merit Scholarship, $5000	Apr 2016
Undergraduate Research Opportunities Program Grant Awardee, $1700	Oct 2015
College of Biological Sciences Study Abroad Scholarship, $1250	Jan 2015
Learning Abroad Center Study Abroad Scholarship, $1500	Nov 2014
Freshman Study Abroad Scholarship, University of Minnesota, $1000	Oct 2014
MacGray Leadership Scholarship, University of Minnesota, $500	May 2014
Gold Scholar at the University of Minnesota, $40,000	May 2013
Bentson Family Scholarship at the University of Minnesota, $24,000	May 2013
National Merit Scholarship, National Merit Scholarship Corporation, $4,000	Apr 2013

9. **Scientific Publications:** List peer-reviewed scientific publications that you have authored or co-authored (list of authors, title, journal volume, page ##, year of publication), non-peer-reviewed publications, and posters/talks that you presented at scientific meetings. Please indicate clearly which are peer-reviewed publications, non-peer-reviewed publications, and posters/talks. You can list manuscripts in submission (especially if they are posted on a preprint server such as bioRxiv), or manuscripts in preparation (if they are already in at least a draft form).

"Experimental Evolution of Bacterial Motility." Michael Blazanin, Michael Travisano. Poster Presentation at 14th Annual Ecological Genomics Symposium. Oct 28-30, 2016

"Host Cues Select for the Evolution of Avirulent Agrobacterium Cheaters." Michael Blazanin, Spencer Parish, Thomas Platt. Poster Presentation at 14th Annual Ecological Genomics Symposium. Oct 28-30, 2016

"Host Cues Select for the Evolution of Avirulent *Agrobacterium* Cheaters." Presentation at Microbial Populations Research Group, University of Minnesota, Aug 30, 2016

"Host Cues Select for the Evolution of Avirulent *Agrobacterium* Cheaters." Presentation at Kansas State University Biology Research Experience for Undergraduates Final Presentations. Aug 5, 2016

Untitled Lightening talk on cooperation and cheating in *Agrobacterium*. Presentation at Ecogen Forum. Jul 28, 2016

"Experimental Evolution of Bacterial Motility." Michael Blazanin, Michael Travisano. Poster and presentation at the Winchell Undergraduate Research Symposium at the Annual Meeting of the Minnesota Academy of Science. Apr 29, 2016

"Experimental Evolution of Bacterial Motility" and Kansas State REU research proposal. Presentation to Microbial Populations Research Group, University of Minnesota, Apr 26, 2016

"Measuring and Modeling Denitrification in Real Time." Presentation to Environmental Microbiology and Biotechnology Research Group. Jan 22, 2016

"Evolution: Motility and Resistance." Presentation to Microbial Populations Research Group. Oct 29, 2015

"Investigating Motility in a Colicinogenic-Resistant-Susceptible Ecology." Presentation to Evolution in the Twin Cities, University of Minnesota. Oct 24, 2014

10. **Science Courses:** List all courses in science that you have taken and the grades received. If you have attended more than one academic institution, indicate the institution at which the courses were taken. Please list one course with its grade per line:

AP Credit: Chemistry, Physics, Biology	5, 5, 5
Nature of Life	Pass
Foundations of Biology I	A
Honors Physics I	A
Nature of Life, Part Two	Pass
Foundations of Biology II	A
Foundations of Biology II Lab	A
Nature of Life, Part III	Pass
Nature of Life, Part IV	Pass
Exploring Research in the Biological Sciences	A
Honors Elementary Organic Chemistry I	A
Directed Research in Ecology, Evolution & Behavior (3 semesters)	Pass, Pass, In Progress
Field Botany in the Andes (In Spanish)	A
Sustainable Tropical Agriculture (In English)	A
Tropical Ecology (In Spanish)	A
Biochemistry	A-
Communicating in the Biological Sciences	A
Organic Chemistry II	A-
Ecology	A
Biology of Microorganisms	A
Genetics	A
Evolution	A
Biology Thesis: Literature Review	In Progress
Graduate Foundations in Ecology, Evolution & Behavior, Semester 1	In Progress
NSF GRF Proposal Writing	In Progress
Biology Thesis: Conveying Results	Planned
Graduate Foundations in Ecology, Evolution & Behavior, Semester 2	Planned

11. **Quantitative Courses:** List all courses in mathematics, statistics, computer programming, or bioinformatics that you have taken and the grades received. If you have attended more than one

academic institution, indicate the institution at which the courses were taken. Please list one course with its grade per line.

AP Credit: Calculus I, Calculus II, Statistics	5, 5, 5
Honors Calculus IV	A
Sequences, Series, Foundations	A
Honors Calculus III	A
Applied Biostatistics	A
Fundamentals of Genomics, Systems Biology & Bioinformatics	A
Microbial Genomics	In Progress
Graduate Seminar: Biological Theory Group	In Progress
Computer Programming for Biology	Planned

12. **English Courses (Required):** List all courses in English that you have taken and the grades received. If you have attended more than one academic institution, indicate the institution at which the courses were taken. Please list one course with its grade per line.

AP Credit: English Language & Composition; English Literature & Composition	5, 5
Critical Literacies: How Words Change the World	Planned

13. **Additional training:** List any short-format intensive training courses or workshops that you have taken to learn specific lab, field, statistical, or computational skills, and which do not appear on your formal transcripts.

14. **Other Applications:** Are you now seeking admission to any other institution for an advanced degree? ____ If yes, please list and specify the type of institution (graduate school, medical school, dental school, other).

Institution	Department	Degree desired
Cambridge University	Biochemistry	Masters
Yale University	Ecology & Evolutionary Biology	PhD
Michigan State University	Integrative Biology	PhD
University of California – San Diego	Division of Biological Sciences	PhD
University of California – Berkeley	Integrative Biology	PhD