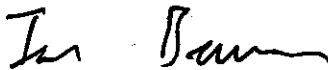


NOMINATION SIGNATURE PAGE

2023 Virginia Outstanding Faculty Awards

Nominations must include this as the cover page of the nomination package PDF submission

Name of Applicant:	Amanda Kyle Gibson
Institution:	University of Virginia
Category (choose only one): <ul style="list-style-type: none">• Baccalaureate Institution• Masters/Comprehensive Institution• Research/Doctoral Institution• Two-Year Institution• Rising Star	Rising Star
Signature of President or Chief Academic Officer:	
Printed Name of President or Chief Academic Officer:	Ian B. Baucom
E-mail address of President or Chief Academic Officer:	provost@virginia.edu
Telephone number of President or Chief Academic Officer:	434-924-3728

Mission Statement

The University of Virginia is a public institution of higher learning guided by a founding vision of discovery, innovation, and development of the full potential of talented students from all walks of life. It serves the Commonwealth of Virginia, the nation, and the world by developing responsible citizen leaders and professionals; advancing, preserving, and disseminating knowledge; and providing world-class patient care.

We are defined by:

- Our enduring commitment to a vibrant and unique residential learning environment marked by the free and collegial exchange of ideas;
- Our unwavering support of a collaborative, diverse community bound together by distinctive foundational values of honor, integrity, trust, and respect;
- Our universal dedication to excellence and affordable access.

Source: www.virginia.edu/statementofpurpose

SUMMARY OF ACCOMPLISHMENTS

Amanda Kyle Gibson moves science forward through both groundbreaking discoveries and innovative training. She is an internationally renowned biologist who applies her expertise in evolution to the global challenges posed by infectious diseases. She is a beloved instructor and mentor, receiving glowing evaluations from students in all her courses. Through her synergistic activities that connect her discovery and teaching, she has advanced equity, inclusivity, and diversity in STEM¹ training, which is already having an impact on the academic and scientific communities of the Commonwealth of Virginia and beyond. She is a 'rising star' who has raised over \$2 million in grants to support her research and training initiatives and received prestigious international awards recognizing her excellence as a teacher and scholar.

Teaching and Mentoring

Gibson has earned a reputation as an outstanding teacher devoted to her students. In 2022, she received the highest teaching honor bestowed upon junior faculty at UVa, the Alumni Board of Trustees Teaching Award. She embeds her students in contemporary challenges posed by infectious diseases. Students quickly realize, however, that the content is secondary to Gibson's deeper learning objective – to empower them as scientific thinkers. Her students engage directly with the scientific process, from asking good questions to communicating data. Gibson uses games and role-play to guide students in articulating abstract concepts. She invites practitioners to speak with her students so they can envision themselves walking those same career paths. As shown in the following examples, Gibson challenges her students to engage with the science classroom as an active learning space for the generation and interrogation of understanding, rather than as a conduit for the passive transmission of established knowledge.

UVa BIOL 4012: Evolution and Ecology of Infectious Diseases: In this course, Gibson intensively trains students in the tools they need to make sense of pandemics. They become proficient in epidemiological modeling and reading primary literature through weekly practice and discussion. Gibson emphasizes fundamental skills, including experimentation and communication, through presentations, writing, and repeated practice designing their "dream experiment." To connect students directly to the professional community, she invites in experts, including the authors of studies read in class, infectious disease doctors at the UVa Hospital, and even a member of the CDC's Epidemic Intelligence Service. Student evaluations score Gibson well above the departmental average in her efficacy (4.78/5) and inclusivity (4.76/5) as an instructor. Their written comments speak to the depth of their learning and enthusiasm:

- "Professor Gibson is hands down the most invested and best professor I have had in the UVA biology department. Her commitment to her students, her respect for the learning process, and her enthusiasm for the course is unmatched. Because of how Prof Gibson treated her students, many of us wanted to put even more effort into the course and learn as much as possible from her."
- "UVA is so fortunate to have you. You are the best professor I've ever had. Thanks for making this such a positive experience."
- "Through this course, I have discovered the importance of communication in scientific discovery. It was when I was working with others and exploring ideas that I felt I was most productive and it was what helped me understand concepts the most. This course really helped me improve this skill of written and oral communication..., and it will be really helpful for me in the future."
- "I [gained] confidence in my ability to speak up and contribute to the class. At the start of the course, I felt somehow less competent than my peers and was nervous to speak up but as the course progressed and there were so many opportunities to contribute, I began to speak up more and I realized that I did really understand the concepts and could share effectively."

¹ STEM: Science, Technology, Engineering, and Mathematics

- “Dr. Gibson had a part in her syllabus about how she was dedicated to maintaining a safe and diverse learning environment and this wasn't just something in the syllabus but rather she showed it every day. There was never a point in time where Dr. Gibson or anyone in the class showed anything but the utmost respect for diversity and the opinions of all.”
- “Dr. Gibson was really good at making sure that we knew that diverse interpretations of an issue or questions were valued, in part because of her respect for the process of learning.”
- “Prof. Gibson ensured that every student could respond to any question with their own perspectives and did not discount any perspective that was different from her own. Many times she took these in with open arms and would even go as far as doing personal research into it to broaden her own perspective.”
- “This was the most amazing course and I'm so sad it's over!”

UVa BIOL 150: Spillover – where, when and why do pathogens jump to new hosts?: In 2020, as courses shifted online and students' summer plans evaporated, Gibson volunteered to offer an online summer course for incoming first years to create community and prepare them for college. The course gave students context for the pandemic through popular science media and guided discussion, while practicing skills students struggle with in college, including quantitative reasoning and figure interpretation. Gibson holds student attention during online classes by minimizing lecture, inviting annotation of shared slides, and leading activities, like Design Your Own Public Service Announcement, that engage varied learning styles. Gibson organized a panel of current undergraduates to speak to the incoming students about their experiences conducting independent research and forming relationships with faculty. These experiences increase long-term success², yet first year students rarely know where to start. Students scored Gibson highly as an effective (4.92/5) and welcoming (4.92/5) instructor:

- “This class far exceeded what I expected from a month-long, online summer course, and it has honestly been one of my favorite classes!”
- “It was a very welcoming experience and I'm glad this was my first look into academics at UVA. Thank you so much for an enjoyable and interesting four weeks!”
- “I have learned so much and I've never been so excited to learn and to engage within a class. It's only been a couple of weeks after Spillover, but I've been applying a lot of what I learned into my everyday life. Whether that be reading current event articles regarding the pandemic or discussing topics we learned in class with some friends.”

Undergraduate Mentoring: Gibson has mentored 15 undergraduate who have done research in her lab. She creates a lab environment that values each person's contributions as she guides them to be independent. Undergraduates are required to attend weekly lab meetings, lead at least one journal club, and present their work publicly at the end of the year. In 2020/2021, when students could not be present in lab due to SARS-CoV-2, she worked with each of her undergraduate researchers to develop projects they could work on remotely. In spite of the challenges of this time, each student had results to present at the lab's virtual poster session in May 2021. The students in Gibson's lab have coauthored papers^{3,4}, presented their research at regional meetings, won awards for their presentations, been awarded research grants, had their research featured in UVa news ([here](#) and [here](#)), and earned prestigious post-graduate positions.

Discovery

Whether they be basic scientists, conservationists, clinicians, or crop scientists, researchers of infectious disease all need to know – why does a disease break out in one population and not another? And why do some individuals get so sick while others appear unscathed by infection? Gibson's research takes on these core problems in disease biology and proposes solutions.

² Haeger, H. and C. Fresquez. *CBE-Life Sci Educ* 15.3 (2016): ar36; ³ Gibson, A.K. and Nguyen, A. *Evol Lett* 5.1 (2021): 16-32; ⁴ Bubrig, L., Janisch, A., Tillet, E. and Gibson, A.K. 76.7 *Evolution* (2022): 1556-1564.

First, Gibson identifies general strategies for reducing the transmission of infectious diseases. Notably, she and an undergraduate definitively established that populations of hosts with reduced genetic diversity experience more severe outbreaks of disease than diverse host populations³. These new findings directly support the development of more sustainable agricultural practices: Gibson found that planting diverse mixtures of crops, rather than monocultures of a single variety, halves disease spread in agricultural fields. This massive reduction speaks to the power of genetic diversity to protect the global food supply and reduce the use of agrochemicals that damage the environment. Gibson's expertise launched an ongoing collaboration with the USDA to inform management strategies for plant-parasitic nematodes in the southeast. These nematodes infect the roots of major cash crops in the region (e.g., cotton, soybean, peanuts) and globally are one of the most economically devastating crop pests due to lost yields and expensive control measures. Gibson's new work argues that genetic diversity offers an effective and cheap means to reduce nematode damage and increase yields.

Second, Gibson enables more accurate predictions of who is likely to get sick. Decades of lab experiments have minutely detailed the mechanisms of host immunity to infection, but in the complex environments in which humans and other organisms live, lesser-known behaviors may be more important than immunity in predicting a host's risk of infection. This work is motivated by the early stages of the COVID-19 pandemic, when behavioral strategies, like isolation and masking, were the key determinants of an individual's infection risk, not their immune status. Gibson's group uses controlled experimental studies to pinpoint the strategies that matter most for an individual's infection risk and subsequent health outcomes in natural contexts. As humans and wildlife face an increasing threat from disease outbreaks, Gibson's findings provide key guidance on what interventions will be most effective and where they should be focused.

Gibson has raised over \$2 million in grant funding in her short time at UVa. She received both a prestigious Jeffress Trust Award for Interdisciplinary Research and a large NIH grant (R35 MIRA) in her first attempts. Her NIH proposal scored in the top 5% of comparable submissions, and the panel reviews applauded Gibson's record, ambition, and creativity:

- "This is an ambitious plan to address complicated problems that arise from the use of simplified experimental systems to study host-parasite interactions... The strengths include the PI's training, production and accolades and the scale and importance of the problem."
- "[The proposal] is ambitious and substantive in scope, with the potential for long-term pursuit of goals that will establish for herself a unique niche in this field of research."
- "The superbly trained and productive, and highly awarded PI has the ability and expertise to lead this emerging research program because she has established a record of creativity and productivity and demonstrates the ability to be innovative."
- "[The PI has a] strong commitment to mentoring undergraduates, including women and underrepresented minorities, leading to honors theses, awards, presentations, and articles."

Gibson is among few researchers, and the only woman in the world, to be awarded both major awards recognizing an outstanding early career evolutionary biologist: the Maynard Smith Prize from the European Society for Evolutionary Biology (2017) and the Dobzhansky Prize from the Society for the Study of Evolution (SSE) (2018). Since starting at UVA, she has been invited to speak at 13 universities in the US and Europe and was featured as a rising star in the field at two conferences. Gibson has been invited to write perspective pieces for an issue of the journal *Evolution* celebrating the 75th anniversary of SSE and for an issue of *Annual Review of Ecology, Evolution, and Systematics*, which typically features the work of more senior faculty.

Knowledge Integration

Gibson is also a recipient of the SSE Huxley Award for her educational contributions to the field

of evolutionary biology. Through broad curricular development that combines her scholarship with her pedagogical skills, Gibson has ensured that her influence as a teacher-scholar extends beyond her immediate community through the creation and open sharing of resources for biology teachers. These efforts are exemplified by the Red Queen Game, a card game that provides a hands-on demonstration of coevolution for virtual or in-person classes. Gibson developed this game with two colleagues, and the associated open-access publication⁵ has been accessed >19,000 times. She maintains a website with free instructional materials, including a gameplay video, instructional slides, and a ready-to-use template for in-class data collection. The game has been played in classrooms across the US and UK. Eight hundred UVa students play this game in their introductory biology class every spring!

Creating a global STEM community in the Commonwealth: Each summer, Gibson also runs a workshop at Mountain Lake Biological Station (MLBS) in southwest Virginia. Students in the early stages of their research careers work together on a mock grant proposal, getting a leg up on the big picture thinking that makes for successful science and building a strong base in writing, a skill with which so many struggle. The workshop increasingly garners international recognition for the Commonwealth as a center for training in biology. It attracts students locally and from as far afield as Portugal and China. Alumni include an employee with the James River Soil and Water Conservation District aiming to prepare for graduate school and a student from Puerto Rico who honed his English-language writing *and* saw his very first bear. In 2022, Gibson brought on junior faculty from Virginia Tech and James Madison University as co-instructors, to promote their careers and strengthen ties between biologists within the state.

Gibson actively recruits and seeks external funding for participants from underrepresented groups: 36% identified as belonging to a minority group in the workshop's 2019 cohort, and 64% in the 2022 cohort. The workshop promotes the achievement and retention of these students in part through establishment of a peer-faculty network that gives them a sense of belonging in the field of evolutionary biology. Students testify to its positive effect: one student's faculty mentor wrote of the workshop, "[My student] just can't stop talking about it. She says that it really helped herself confidence in addition to the overt skills that you were trying to get across. She is as delighted with the writing skills as the research skills. It is just terrific!"

Service

Gibson's service efforts reflect her dedication to increasing diversity, equity, and inclusion in STEM. Students from marginalized communities or nontraditional backgrounds are severely underrepresented in biology, especially in ecology and evolution. For example, in 2014, African Americans represented 13% of the US population, but they earned less than 1.8% of Ph.D.'s awarded in ecology/evolution fields and only 6.4% of Ph.D.'s in all subfields of biology⁶. Undergraduates gravitate towards, and stick with, disciplines where they find mentors and role models with whom they identify⁷. Thus, a lack of diversity at the Ph. D. level perpetuates disparities, resulting in long-term underrepresentation of minorities in higher education and the scientific workforce. Gibson has worked to address this problem by spearheading initiatives of the Biology Department's Graduate Admissions Committee to actively recruit students from underrepresented groups through promotional materials, management of the department's social media, and networking with potential applicants at conferences for minority scientists. She worked with UVa's Graduate School to create transparent guidelines for applicants' submission materials and increased equity in evaluations with a simple rubric that assesses students' accomplishments in the context of the opportunities they have had. Remarkably, in just two years, these efforts have contributed to an increase in the diversity of the graduate applicant pool: the percentage of matriculating students identifying as first-generation or as an underrepresented minority increased from 25% in 2019 to 50% in 2020.

⁵ Gibson, A.K. et al. *Evol. Educ. Outr.* 8.1 (2015): 1-9. ⁶ NSF, NCSES (2015) Science and Engineering Degrees, by Race/Ethnicity of Recipients: 2002–12. NSF 15–321 <https://www.nsf.gov/statistics/2015/nsf15321/>. ⁷ Kricorian, K. et al. *Int. J. STEM Educ.* 7.1 (2020): 1-9.

PERSONAL STATEMENT

Before starting at UVA, I spent a few months at an institute that brings together scholars from many disciplines, from studio art to jurisprudence. Each of us had to speak about the problem we were working on. The prompt was: "What keeps you up at night? What gets you up in the morning?" The scholars gave impressive answers: mediation of international conflict, Aristotle's take on the good life, delimiting self. I felt stuck. I decided to speak about the hypothesis that infectious diseases spread more slowly in genetically diverse populations, where hosts are distantly related to one another. As I often do to make sense of problems, I conducted a simulation with the audience, with pieces of candy as pathogens. The scholars, decades senior to me, looked bemused. At the least, they understood that I love this idea. It echoes the challenge that originally drew me to my field: if pathogens are pervasive – even bacteria get viruses! – then there may be pervasive solutions, ones that will prevent disease spread in our crop plants and reduce outbreaks in the wildlife that transmit diseases to us. Indeed, my lab later established that genetic diversity is one of these general solutions – increasing the diversity of hosts, be they bacteria or wheat plants, dramatically reduces disease spread. As compelling as I find this research, I felt disingenuous presenting it in response to the prompt "What keeps you up at night?" While working on this problem at the institute, I slept great.

The sleeplessness came a year later. I'd finished a draft of the syllabus for my first course at UVA, "Evolution and Ecology of Infectious Diseases," scheduled for fall 2020, when a pandemic forced us into isolation. This course was my own to design, and I envisioned it as an opportunity to guide premedical students to reflect on their assumptions. They see infections as pests to be eradicated from patients. There is truth to this view, but pathogens are also biological marvels – they lay bare our interconnectedness, leaping between individuals, across oceans, from one species to another. As the most potent selective force on the planet, they have written much of our evolutionary history. SARS-CoV-2 made this plan feel out of touch though. My soon-to-be students were losing social ties and loved ones as the virus spread and evolved. They were living and breathing an epidemic, the very phenomenon I had studied for over a decade. Surely, I could offer these students more than theoretical abstractions and biological curiosities?

At moments like these, I reflect on what my own mentors would do. My mentors are known as brilliant researchers, but I admire them most for their devotion to teaching and mentoring. They taught me that research and teaching are related forms of sense-making, of actively figuring out how something works. My Ph.D. advisor often tells me he can't understand anything properly until he teaches it. They treat their classroom as a forum for mutual exchange, where activities and discussion give students agency to identify what is important and what doesn't make sense. Later, while trying to teach myself to teach, I discovered the compelling data demonstrating that their approach of active, student-led learning dramatically increases the performance of undergraduates¹ and narrows the achievement gap for minority and low-income students, relative to traditional lecture-based STEM² teaching³.

In taking this new perspective – of teaching as a collaborative process of sense-making with my students – my 2020 teaching became a rare privilege. How often do we get to work side-by-side with our students on the very problem that each of us needs so desperately to understand? I suddenly felt energized, designing and teaching not one but two new courses in 2020, one for first years and one for upper-level students. I re-framed my courses as basic training in the skills researchers were using to make sense of the pandemic – epidemiological modeling, hypothesis formation, data interpretation. I set the same objective for my students as I do for researchers in my lab – to recognize that they do not have all the answers, but they have the tools to find them.

Classrooms also serve as communities, and I felt this acutely during the virtual learning of 2020. Every day, I booted up Zoom and watched my students' faces pop up from rooms where they

¹Freeman, S. et al. *PNAS* 111.23 (2014): 8410-8415; ²STEM: Science, Technology, Engineering, and Mathematics; ³Theobald, E.J., et al. *PNAS* 117.12 (2020): 6476-6483.

spent their days alone. It reminded me of something a teaching mentor told me – as a faculty member, I may be one of few adults that a college student can turn to in a time of need. In this light, my job is first and foremost to show students that I'm here and I'm listening. I have indeed been struck by how alone and adrift many students seem when they step into my office. I notice this most in first-generation and minority students who struggle to navigate the “hidden curriculum” of college and to form relationships with other students and faculty. I have also been amazed at how small gestures – learning students' names, checking in at the start of class – can root students in the college community and empower them to seek me out.

As a professor before, during, and “after” the pandemic, I understand now that our most meaningful work is not accomplished in isolation, lecturing on a stage or locked in our own minds. In the classroom and lab, we make progress, and have more fun, when we work through problems with our students. I have come to see a successful career not as a set of discoveries, but as a series of relationships, with each chapter defined by the mentee I had the good fortune to work with. I love this vision because it captures the rare gift we get as teacher-scholars, to both give and receive as we guide our students to become confident, independent thinkers.

I struggle with this vision too, because I know that these formative relationships are not distributed equitably. Students from marginalized groups often fail to connect with mentors in college⁴ and suffer from a sense that they don't belong in STEM⁵. This lack of connection with faculty mentors reduces long-term success and well-being⁶ and leads to underrepresentation in the STEM workforce of ethnic minorities and first-generation college graduates^{7,8}. These data trouble me, but they also show a path forward. Mentorship cascades through communities: in creating opportunity for one student, I invest in a future mentor who will guide the next students over the same obstacles. In my time at UVA, I have sought to foster positive mentorship communities through my teaching practices, advocacy in graduate recruitment and admissions, and careful stewardship of a culture of respect and openness in my own lab. I experience a microcosm of this community-building process each summer at Mountain Lake Biological Station, where I invite students and faculty for a workshop in evolutionary biology. The students come from different institutions, countries, and backgrounds; they have different interests and career goals. Nonetheless, they team up to think, talk, and write about science all day every day for a week. They get stuck, disagree, and revise as faculty provide feedback. No matter what, at the end of each day, we come together to walk in the woods and share a meal. When they leave, they're better able to articulate their ideas, and, most importantly, they have shared experiences with new mentors and friends that make us all feel like we're in the right place.

This then is the challenge that keeps me up at night: to build inclusive scientific communities that empower students, no matter their background, to be independent thinkers, confident self-advocates, and thoughtful mentors in their own right. This challenge pervades all aspects of my work – my teaching, research, and service. It is also the goal that gets me up in the morning. I do this work for, and because of, students like my very first mentee, an undergraduate student whom I'll call S. S and I began working together in the 2nd year of my Ph.D. S came from a rural county with failing public schools, a broken home where she raised her siblings, and a deeply religious background that preached against evolution. She ended up working in an evolutionary biology lab because her intro biology teacher saw her potential and welcomed open discussion about the conflict, or lack thereof, between science and faith. S proved to be exceptionally talented and driven. As she was finishing college, with a field job abroad and plans to apply for a Ph.D., S gave me her stole of gratitude, a symbol of appreciation for the impact I had made on her life. S's story was so different from my own, but, through the simple act of believing in her, I got to be a part of her journey. I attended S's Ph.D. defense this spring, where she stood up in front of her friends, family, and colleagues and thanked the many mentors who helped her believe in herself. I can think of no greater honor than to count myself among them.

⁴ Harris, TM et al. *Comm Educ* 68.1 (2019): 103-113; ⁵ O'Brien, LT et al. *Soc Psych Educ* 23.2 (2020): 449-477; ⁶ Great Jobs, Great Lives: the 2014 Gallup-Purdue Index Report © 2014, 2016 Gallup, Inc.; ⁷ NSF, NCSES (2021) Doctorate Recipients from U.S. Universities: 2020. NSF 22-300. <https://ncses.nsf.gov/pubs/nsf22300>; ⁸ Pew Research Center (2021) “Stem jobs see uneven progress in increasing gender, racial, and ethnic diversity”

ABBREVIATED CURRICULUM VITAE
Amanda Kyle Gibson, Ph.D.

EDUCATION AND EMPLOYMENT

University of Virginia, Charlottesville, VA

Assistant Professor of Biology, January 2019 – present

Institute for Advanced Study, Berlin, Germany

Fellow of the College for Life Sciences, September – December 2018

Emory University, Atlanta, GA

National Institutes of Health (NIH) Postdoctoral Fellow in Research and Science Teaching, September 2016 – August 2018

Indiana University, Bloomington, IN

Ph.D. in Ecology, Evolution and Behavior, September 2010 - August 2016

National Science Foundation (NSF) Graduate Research Fellow, 2010-2015

NIH Common Themes in Reproductive Diversity Trainee, 2012-2013, 2015-2016

National Institutes of Health, Bethesda, MD

National Institute of Allergy and Infectious Disease Trainee, July 2009-August 2010

Université de Paris-Sud XI, Orsay, France

Fulbright Scholar, September 2008 – June 2009

Amherst College, Amherst, MA

B.A. in Biology, *summa cum laude*, September 2004-May 2008

RECENT HONORS, AWARDS & FELLOWSHIPS

- 2022 University of Virginia Alumni Board of Trustees Teaching Award
- 2021 Invited speaker, International Symposium celebrating the 75th anniversary of the Society for the Study of Evolution (one of six speakers)
- 2020 Invited “rising star” speaker, International conference on Evol. Biology of *Caenorhabditis*
- 2018 Fellow, Berlin Institute for Advanced Study (*Wissenschaftskolleg zu Berlin*)
- 2018 Dobzhansky Prize, Society for the Study of Evolution
- 2017 Maynard Smith Prize, European Society for Evolutionary Biology
- 2016 Huxley Award for Education, Society for the Study of Evolution

RECENT PUBLICATIONS (OUT OF 34; undergraduate authors underlined)

1. **AK Gibson** and CR Amoroso. 2022. Ecology and evolution of parasite avoidance. Invited, in press at *Annual Review of Ecology, Evolution and Systematics*
2. LT Bubrig, AN Janisch, EM Tillet, and **AK Gibson**. 2022. Contrasting parasite-mediated reductions in fitness within vs. between patches of a nematode host. *Evolution*. 76(7): 1556-1564.
3. **AK Gibson**. 2021. Genetic diversity and disease: the past, present and future of an old idea. *Evolution* 76(S1): 20-36.
4. **AK Gibson** and AE Nguyen. 2021. Does genetic diversity protect host populations from parasites? A meta-analysis across natural and agricultural systems. *Evolution Letters* 5(1): 16-32.
5. DM Hawley, **AK Gibson**, AK Townsend, ME Craft, and JF Stephenson. 2021. Bidirectional interactions between host social behavior and parasites arise through ecological and evolutionary processes. *Parasitology* 148(3): 274-288.
6. **AK Gibson**. 2019. Asexual parasites and their extraordinary host ranges. *Integrative and Comparative Biology* 59(6): 1463-1484.
7. C Liu*, **AK Gibson***, P Timper, LT Morran, and RS Tubbs. 2019. Rapid change in host specificity in a field population of the biological control organism *Pasteuria penetrans*.

Evolutionary Applications 12(4): 744-756. *authors contributed equally

FUNDING (\$2,198,054 TOTAL)

1. UVA GIDI-UP Award Gibson (PI); 05/09/2022-05/08/2023
Testing pathogen diversification as a tool to promote sustainable pest management
Award amount: \$10,000
2. Society for the Study of Evolution Workshop Grant Gibson (PI); 2019, 2020, 2022
Graduate Student Workshop in Evolutionary Biology
Award amount: \$3,000 each (awarded three times, forfeited in 2020 due to COVID-19)
3. Morven Sustainability Teaching and Research Grant Gibson (PI); 11/15/2021-11/14/2022
Testing genetic diversification as a tool to promote sustainable pest management
Award amount: \$3,510
4. NIH/NIGMS R35 MIRA Gibson (PI); 8/1/2020-7/31/2025
A general test of the genetic basis of parasite resistance across genetic and environmental contexts
Award amount: \$1,981,298, plus \$92,746 equipment supplement
5. Jeffress Memorial Trust Award Gibson (PI); 9/30/2020-6/30/2022
Modeling the evolution of disease resistance in a variable world
Award amount: \$104,500

TEACHING ACTIVITIES (150 STUDENTS TOTAL)

Undergraduate courses: BIOL 150 Disease Spillover (Summer 2020); BIOL 4012 Evolution and Ecology of Infectious Diseases (Fall 2020, Fall 2021); Graduate courses: BIOL 8084 Advanced Ecology and Evolution (Spring 2020, 2022, 2023); BIOL 8070 Colloquium in Population Biology (Spring 2021); Multiple ranks: Graduate Workshop in Evolutionary Biology (Summer 2019, 2022, head instructor)

SUPERVISED RESEARCH (22 STUDENTS TOTAL)

Undergraduates: S. Budhwar (2019-2020); V. Feist (2021-present); A. Kamali (2022- present); E. Kirschke (2019-2021); A. Lockwood-Shabbat (2022-present); D. McNeill (2019); A. Motter (2020-2022); A. Nguyen (2019-2021); A. Odei (2020-2021); L. Shepard (2021-present); J. Singh (2021-present); T. Sol (2022-present); S. Talley (2022-present); E. Tillet (2019-2021); S. Wong (2019-2022). Ph.D. students: I. Amundson (2021-present); L. Bubrig (2020-present); J. Jiranek (2022-present); A. Ramirez (2021-present). Postdoctoral fellows: C. Amoroso (2021-present); F. Mundim (2019-2022, Assistant Professor, Utah State University); L. Peng (2022-present)

SELECTED INVITED SEMINARS (OUT OF 29)

2022: Dept. Seminars at *New York University*, *Virginia Tech*. 2021: Dept. Seminar at *Oklahoma University*; Seminar Series in Ecology Evolution and the Environment, *Trinity College Dublin*; Laboratory of Parasitic Diseases Seminar Series, *NIH*. 2020: Ecology and Evolution of Infectious Disease Series, *University of California, Berkeley*; 2019: Dept Seminars at *James Madison University*, *University of Pittsburgh*, *University of Connecticut*, *Tulane University*

RECENT SERVICE

Department Committees: Graduate Admissions (2019-2022); Community and Seminar (2019-present); Social media manager (2020-present); NSF EXPAND Curriculum (2021); Departmental Retreat (Chair, 2021); *ad hoc* Space (2021); Ph.D. Committees (8 total). **International:** Evolutionary Biology of *Caenorhabditis* Conference (2024 organizer); NSF Panel reviewer; *ad hoc* reviewer for Swiss National Science Foundation, Society for the Study of Evolution, NSF, UK National Environment Research Council; Peer reviewer for 17 journals

LETTERS OF SUPPORT

FROM SUPERVISORS, COLLEAGUES, AND COMMUNITY MEMBERS

"Amanda Gibson is a truly outstanding scholar and researcher... She has taken multifaceted approaches to the question of why so many species reproduce sexually... Taken together, [her] body of work has greatly improved our understanding of how host-parasite interactions mediate the evolution of modes of reproduction. **The impact of this work is something researchers might, if they are extremely talented, achieve over a lifetime of work.** Dr. Gibson has done it before she has even been tenured. So, is she a 'Rising Star'? I would say she has achieved stardom." - *Lynda Delph, Distinguished Professor of Biology, Indiana University; Past President of the Society for the Study of Evolution; Member, American Academy of Arts & Sciences*

"Dr. Amanda Gibson is one of the most-watched researchers in the world studying how hosts and pathogens coevolve. Her status as the rising star in the field was cemented when she [was] awarded the outstanding young investigator prizes from both the North American and European evolution societies. In her first year as a faculty member, she earned a rare NIH MIRA - a grant awarded not for the details of any single project, but for the promise of her research program on the whole. **The stunning discoveries that Gibson has been able to make come through figuring out how to reach the gold standard of understanding any biological process - experimental manipulation.**" - *Butch Brodie, B.F.D. Runk Professor in Botany, Director of Mountain Lake Biological Station, UVA; Past President of the American Society of Naturalists*

"[Dr. Gibson] **already has huge national and international name recognition, attracts the best students, and is outstanding in the breadth of concepts and approaches that she brings to her research.** Her lab group meetings are lively, stimulating, with undergraduates actively involved in lab projects and ideas. As an advisor, she is supportive, full of ideas, demands high standards and commitment, and enriches it all by originality, a sense of humor and straightforward pleasant personality." - *Janis Antonovics, Professor of Biology (Emeritus), UVA; Member, American Academy of Arts & Sciences; Past President of the Society for the Study of Evolution and the American Society of Naturalists; Fellow of the Royal Society*

"**Mandy is very clearly a rising star... [She] has a very keen sense of commitment to education and outreach.** Incredibly, she volunteered to help me teach our Honors Evolution class in Biology... She was awarded the Ruesink Outstanding Teaching Award at Indiana University for her dedicated and effective teaching in Honors Evolution... Finally, Mandy has mentored some very gifted undergraduate students in research... **I am confident that Mandy will mentor many more young scientists as her career progresses, and that her students will remember her as being critically important in their own career trajectories.** In summary, I think **Mandy is at the very top for both research and education.**" - *Curt Lively, Distinguished Professor of Biology, Indiana University, Elected Honorary Fellow of the Royal Society of New Zealand*

"I want to speak specifically to Mandy Gibson's service in graduate education... Mandy's summer workshop helps student identify the big ideas and develop an approach for tackling them such that they feel ownership and a sense of belonging in the field. **I have seen first-hand that students leave the workshop with new self confidence** that leads to success as they present their research, write grant proposals, and interact with other scientists. In addition, **Mandy has gone beyond expectations in her efforts to increase the diversity of graduate applicants**, including attending an undergraduate research conference for underrepresented groups, engaging students at their posters, and encouraging them to consider graduate studies. **Her ability to make students feel supported and their ideas valued has made her a go-to for students** to vet their ideas as they are putting together their research proposals." - *Laura Galloway, Associate Dean for the Sciences and Research, Commonwealth Professor of*

Biology, UVa; President of the Society for the Study of Evolution

"In the class I observed, students were remarkably engaged in the class, enthusiastically participating, and they were stimulated both by Mandy's evocative style and specific activities designed to encourage student participation. I also noted that she skillfully changed the pace of her class to increase student engagement. For example, after describing the outline of a well-known hypothesis in plant population distribution, she asked the students to break up into groups and, use small white boards, to describe their own ways in which they would design experiments to test this hypothesis. The groups then returned to the class at large and described their findings and proposals... These kinds of demonstrations and activities clearly brought home the impact of the hypothesis under discussion in ways that would have been difficult by more standard didactic presentation. **Mandy's teaching style is a model for highly effective teaching and, even at this very early stage in her career, I was astounded to see that she is already one of the best teachers in our department."** - Robert Grainger, *W.L. Lyons Brown Professor of Biology, UVa*

FROM STUDENTS (*anonymized*)

"Dr. Gibson is the type of professor I had always wanted after many semesters of simply having to memorize facts from lecture slides. [She] found ways to make science seem "tangible" rather than abstract theoretical ideas... She also "humanized" science by having us read real, published primary scientific literature and then inviting the authors to speak to the class via Zoom. Getting to speak with the researchers directly was such a special opportunity and some of the career advice they shared with the class is something I will never forget... **It was always so clear that her primary goal was to foster a positive learning environment where everyone could succeed.** Students like me who were so used to focusing on getting a certain grade could instead focus on learning and enjoying the course material... She is the reason I am currently pursuing research positions in labs that study viruses. She is the reason I can comprehend the dense scientific publications assigned to me in other classes. She is the reason that I've realized that biology is much more than human anatomy or memorizing different taxa. Dr. Gibson is a truly special professor, and one of the best I've ever had."

"I am a Community Scholar pursuing a degree in Wildlife Biology... After returning to academia after many years of reflection upon my education, I can without reservation say that Dr. Gibson is one of the finest professors I have ever had... When I was struggling at the end of the semester, I reached out to her expressing my doubts about being able to finish the course. Her response was one of the most thoughtful, supportive, and deeply kind sentiments I have ever received from anyone. Her words made all of the difference to me... **She shared a piece of wisdom with me that I found to be particularly profound: becoming comfortable with feeling unintelligent is a process that she wants her students to grapple with and push through, because that is what science is.** She then suggested a detailed plan of action... I am so grateful to have had the privilege of learning under Dr. Gibson... Her passion and integrity are an inspiration to me and have made a lasting impact on my path."

"I took a workshop that Mandy developed to help early career graduate students learn how to propose a research project that would answer a "big question"... The writing skills I gained that week gave me the confidence to apply and attain many grants throughout my career. I also took a graduate class focusing on coevolution with Dr. Gibson and got to experience more of her teaching... There was always a different activity and she spoke to every learning style. **It was the most fun I've ever had in a classroom. Mandy helps me figure out the question I didn't know I was asking and inspires the confidence to go find the answer."**

"When I'm a professor leading my own lab, I can only hope to be half as fantastic of a mentor, half as inspiring to my students, and half as fun in class as Mandy is."