

William C. Beckerson, Ph.D. – Curriculum Vitae



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@aBitofBiology



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EDUCATION

University of Louisville - Louisville, KY, USA Doctor of Philosophy in Biology	2015-2020
University of Louisville - Louisville, KY, USA Master of Science in Biology	2015-2017
Georgetown College - Georgetown, KY, USA Bachelor of Science in Biology / Minor: Business Management	2009-2013

RESEARCH EXPERIENCE

Postdoctoral Research:

EC MSCA Fellow at Utrecht University, Utrecht, NL (PI: Sander van den Heuvel, PhD) 2023-2025
Characterizing the neuronal effects of *Ophiocordyceps* secreted proteins using *C. elegans*

NSF PRFB Fellow at University of Central Florida, FL, USA (PI: Charissa de Bekker, PhD) 2021-2023
Linking parasite genomes, environmental ques, and host phenomes in *Ophiocordyceps*

Dissertation Research:

Ruhr-Universität Bochum, Bochum, DE (Collaborator: Dominik Begerow, PhD) 2018-2019
Implementation of CRISPR Cas9 in *Microbotryum lychnidis-dioicae*

Université Paris-Sud, Orsay, FR (Collaborator: Tatiana Giraud, PhD) 2016-2018
Comparative genomics of species-specific effectors in the *Microbotryum* genus

University of Louisville, KY, USA (PI: Michael Perlin, PhD) 2015-2020
Molecular analysis of secreted proteins in the *Microbotryum* genus

Pedagogical Research:

University of Louisville, KY, USA (PI: Deborah Yoder-Himes, PhD) 2017-2021
Analyzing the importance of dose-response in active learning environments
Analyzing the impact of active learning on different student social personalities

PUBLICATIONS

Peer Reviewed Articles:

Beckerson WC, Krider C, Mohammad UA, de Bekker C. (2023). 28 Minutes Later: Investigating the role of aflatrem-like compounds in *Ophiocordyceps* parasite manipulation of zombie ants. *Animal Behaviour* - **Accepted** (*BioRxiv* <https://doi.org/10.1101/2022.09.08.507134>)

Will I, Beckerson WC, de Bekker C. (2023). Using machine learning to predict protein-protein interactions between a zombie ant fungus and its carpenter ant host. *BioRxiv* <https://doi.org/10.1101/2022.09.09.507359>

Beckerson WC, Anderson JO, Kulkarni S, Perpich JD, Yoder-Himes D. (2023). It's About Time: Exploring the dose-dependent effects of active learning on students of different social personalities in an upper-level biology course. *Journal of College Science Teaching*. - **Accepted**

De Bekker C, Beckerson WC, Carolyn Elya. (2021). Mechanisms Behind the Madness: How do zombie-making fungal entomopathogens affect host behavior to increase transmission? *mBio* 12(5), e01872-21. <https://doi.org/10.1128/mBio.01872-21>

Beckerson WC, Anderson JO, Perpich JD, Yoder-Himes D. (2020). An Introvert's Perspective: Analyzing the impact of active learning on social personalities in an upper-level biology course. *Journal of College Science Teaching* 49(3), 47-57. https://doi.org/10.2505/4/jcst20_049_03_47

Beckerson WC, de la Vega RCR, Hartmann FE, Duhamel M, Giraud T, Perlin MH. (2019). Cause and Effectors: Whole genome comparisons reveal shared but rapidly evolving effector sets among host-specific plant-castrating fungi. *mBio* 10:e02391-19. <https://doi.org/10.1128/mBio.02391-19>

Kuppireddy VS, Uversky VN, Toh SS, Tsai M-C, Beckerson WC, Cahill CC, Carman B, Perlin MH. (2017). Identification and initial characterization of effectors of an anther smut fungus and the potential host target proteins. *International Journal of Molecular Science* 18, 2489. <https://doi.org/10.3390/ijms18112489>

Peer Reviewed Teaching Lessons:

Beckerson WC. (2022). Small Organisms with Big Consequences: Understanding the microbial world around us. *CourseSource*. <https://doi.org/10.24918/cs.2022.27>

Textbooks:

Beckerson WC, Laraba I, Torres-Cruz TJ, Steinkraus D, Hajek A. (2023). *Mechanisms of Host Manipulation and Mimicry in Fungi*. In: Haelewaters D. (ed.) *Biodiversity and Evolution of Fungal Parasites and Pathogens* (pp. xxx-xxx). Amsterdam, Netherlands: Elsevier. - **In Preparation**

Savchenko K, Beckerson WC, Aime C. (2023). *Economically Important Plant Parasites: Rusts and smuts*. In: Haelewaters D. (ed.) *Biodiversity and Evolution of Fungal Parasites and Pathogens* (pp. xxx-xxx). Amsterdam, Netherlands: Elsevier. - **In Preparation**

Perlin MH, Beckerson WC, Gopinath A, Cobbs G. (2019). *Molecular and Cellular Genetics: Laboratory Studies*. San Diego, California United States: Cognella Academic Publishing. **2nd Edition**

Perlin MH, Beckerson WC, Gopinath A, Cobbs G. (2018). *Molecular and Cellular Genetics: Laboratory Studies*. San Diego, California United States: Cognella Academic Publishing. **1st Edition**

FUNDING

Extramural Funding and Fellowships (\$147,605 & €203,464):

Marie Skłodowska-Curie Actions Postdoctoral Fellowship (MSCA): NL	(€203,464)	2022
NSF Postdoctoral Research Fellowship in Biology (PRFB): USA	(\$138,000)	2021
Award number (FAIN): 2109435		
GSA Fungal Genetics Conference Travel Award: USA	(\$250)	2019
DAAD Short Term Research Grant: DE	(\$4,075)	2018
Chateaubriand STEM Fellowship: FR	(\$5,280)	2016

Intramural Funding: University of Central Florida, FL, USA (\$55,000):

Preeminent Postdoctoral Program	(\$55,000)	2020
Co-written with: Dr. Charissa de Bekker		

Intramural Funding: University of Louisville, KY, USA (\$3,236):

Biology 1970's Cohort Fund Grant	(\$200)	2019
Graduate Student Council Travel Grant	(\$350)	2019
Graduate Network of Arts and Science Travel Grant	(\$250)	2019
Graduate Student Council Travel Grant	(\$350)	2018
Arts & Science Research & Creative Activities Grant	(\$500)	2018
Biology Graduate Student Association Travel Grant	(\$175)	2018
Joint Arts & Science Research & Creative Activities Grant	(\$1,311)	2016
Co-written with: Venkata S. Kuppireddy		
Graduate Network of Arts and Sciences Research Fund	(\$100)	2016

Significant Contributions to Other Grants (\$296,889):

NSF Track I International Research Experience for Students: USA	(\$296,889)	2018
Co-written with: (PI) Dr. Michael H. Perlin Award number: I82485I		

CONFERENCE PRESENTATIONS

Oral Presentations:

- 8th Conference on Physiology of Yeasts and Filamentous Fungi – Cork, IR 2023
Using Yeast to heterologously study the behavior-modifying effects of recalcitrant zombie fungi biomolecules
- Gordon Research Seminar on Cellular and Molecular Fungal Biology – NH, USA 2022
28 Minutes Later: Analyzing the role of aflatrem-like effectors in the behavioral manipulation of Zombie Ants
- Animal Behavior Society Online Conference – online 2021
28 Minutes Later: The role of secreted effectors in the behavioral manipulation of zombie ants
- Ruhr-Universität Bochum *Microbotryum* Symposium – Bochum, DE 2019
An Unorthodox CRISPR Approach for an Unorthodox Fungus
- Asilomar Fungal Genetics Conference: Smut Convergence – CA, USA 2019
Cause and Effectors: Secretome comparison of members from the anther-smut pathogen species complex, *Microbotryum violaceum*
- Gordon Research Seminar on Cellular and Molecular Fungal Biology – NH, USA 2018
The First Cut is the Deepest: Implementing CRISPR Cas9 as a transformation system for site specific gene disruptions in the fungal pathogen species complex *Microbotryum violaceum*
- Kentucky Academy of Science Conference – KY, USA 2016
Identifying unique small secreted proteins in divergent species of the fungal pathogen complex *Microbotryum violaceum*
- Ruhr-Universität Bochum *Microbotryum* Symposium – Bochum, DE 2016
Analyzing the role of protein-protein interactions in host/pathogen co-evolution

Poster Presentations:

- European Conference on Fungal Genetics – Innsbruck, AT 2023
28 Minutes Later: A proof of concept for testing behavior-manipulating compounds from zombie-making fungi
- Gordon Research Conference on Cellular and Molecular Fungal Biology – NH, USA 2022
28 Minutes Later: Analyzing the role of aflatrem-like effectors in the behavioral manipulation of Zombie Ants
- National Association of Biology Teachers: Professional Conference – GA, USA 2021
It's About Time: Exploring the dose-dependent effects of active learning on student social personality in an upper-level biology course
- National Association of Biology Teachers: Professional Conference – GA, USA 2021
The Zombie Fungus Foray: Community science outreach using iNaturalist to discover Zombie Ants
- National Association of Biology Teachers: Professional Conference – IL, USA 2019
An Introvert's Perspective: Analyzing the impact of active learning on multiple levels of class social personalities in an upper-level biology course
- Asilomar Fungal Genetics Conference – CA, USA 2019
Cause and Effectors: Secretome comparison of members from the anther-smut pathogen species complex, *Microbotryum violaceum*
- Gordon Research Conference on Cellular and Molecular Fungal Biology – NH, USA 2018
The First Cut is the Deepest: Implementing CRISPR Cas9 as a transformation system for site specific gene disruptions in the fungal pathogen species complex *Microbotryum violaceum*

PROFESSIONAL PRESENTATIONS

- Arkansas State University Queretaro STEM Week Invited Speaker – Queretaro, MX 2023
Real-life Zombies and Where to Find Them: How fungi manipulate animal behavior!
- Utrecht U. Molecular Life Sciences Honors Program Invited Speaker – Utrecht, NL 2022
Observations from the Crypt: The science behind zombie ants and their fungal parasites
- University of Oxford Invited Speaker – Oxford, UK 2022
28 Minutes Later: The role of secreted effectors in the behavioral manipulation of zombie ants

University of Louisville Invited Speaker Series – KY, USA	2020
Comparative secretomics and functional analysis of effectors utilized by the <i>Microbotryum</i> genus of anther-smut fungal pathogens, and their role in host-specificity	
University of Central Florida Invited Speaker Series – FL, USA	2020
Comparative secretomics and functional analysis of effectors utilized by the <i>Microbotryum</i> genus of anther-smut fungal pathogens, and their role in host-specificity	
Georgetown College Invited Speaker Seminar – KY, USA	2019
Cause and Effectors: How rapidly evolving effectors lead to host-specificity between <i>Microbotryum</i> and Caryophyllaceae	
Belknap Academic Building Anniversary Event – KY, USA	2019
An Introvert's Perspective: Analyzing the impact of active learning on multiple levels of class social personalities in an upper-level biology course	
Ruhr-Universität Bochum Invited Speaker – Bochum, DE	2019
The History and Future of CRISPR Cas9	
Ruhr-Universität Bochum Invited Speaker – Bochum, DE	2018
The First Cut is the Deepest: CRISPR Cas9 and how to get started	
Georgetown College Invited Speaker Seminar – KY, USA	2016
Here and Back Again: A GCPALS tale	
Université du Paris Sud Chateaubriand Fellowship Invited Speaker – Orsay, FR	2016
Identification of Small-Secreted Proteins in the <i>Microbotryum</i> genus	

PROFESSIONAL DEVELOPMENT / SERVICES

Training/Workshops/Conferences:

Gordon Research Seminar: Cellular Molecular Fungal Biology 2024 Conference Chair	2022-2024
NSF Improving Undergraduate STEM Education Program – UCF, FL, USA	2022
2022	The Inclusive STEM Teaching Project
Collaborative Institutional Training Initiative – UCF, FL, USA	2021
2021	Human Subjects Research – Group 2
	Social/Behavioral Research Investigators and Key Personnel
2021	Communicating Research Findings
2021	Conflict of Interest
Preparing Tomorrow's Faculty Program – UCF, FL, USA	2021
NIH Grant Writing Virtual Conference – UCF, FL, USA	2020
Training with Remote Options for COVID-19 – UofL, KY, USA	2020
Research Academy RUHR: Open Access Science Workshop – UB, Bochum, DE	2019
Faculty Search Committee: Diversity Training – UofL, KY, USA	2019

Professional Societies/Organizations:

Animal Behavior Society	2021-current
National Association of Biology Teachers	2019-current
2021-2022	Justices, Equity, Diversity, and Inclusion Committee
2019-2020	Community Science Committee
Genetics Society of America	2018-current
2022	Science Communication Virtual Networking Moderator for the 31 st FGC
Kentucky Academy of Science	2014-2020

University Services:

UofL Biology Alumni Advice Panel – UofL, KY, USA	2021 & 2022
Committee for the Invited Speaker Series – UCF, FL, USA	2021-2022
Diversity, Equity, and Inclusion: Classroom Isolation Subcommittee – UCF, FL, USA	2021
Biology Undergraduate Student Association: Graduate Student Panel – UofL, KY, USA	2019
Biology Faculty Search Committee: Graduate Student Representative – UofL, KY, USA	2019
Student Grievance & Discipline Committee – UofL, KY, USA	2016-2017
2016-2017	Natural Science Division Representative

Graduate Network of Arts & Sciences – UofL, KY, USA		2016-2018
2017-2018	Vice President	
2017	Natural Science Rep. for Grant Review Committee	
2016-2018	Department of Biology Representative	
Biology Graduate Student Association – UofL, KY, USA		2015-2020
2019-2020	President	
2018-2019	Graduate Student Rep.	
2016-2017	Social Chair	
2016 & 2020	Webmaster	
2016-2020	Member	

Community Services:

Florida Undergraduate Research Conference (FURC) Abstract Reviewer – FL, USA	2021
UCF Student Scholar Symposium for Undergraduate Research (SURE) Judge – FL, USA	2021
DuPont Manual Regional Science Fair Judge – Louisville, KY, USA	2019
DuPont Manual Regional Science Fair Judge – Louisville, KY, USA	2018
Louisville Regional Science & Engineering Fair Judge – KY, USA	2018

Peer Review Services:

Molecular Ecology	1 paper	2022
CourseSource	2 papers	2020-2021
Society for Molecular Plant-Microbe Interactions	1 paper	2020

TEACHING EXPERIENCE

NSF Postdoctoral Research Fellowship		2021-2023
Concurrent teaching for the duration of a PRFB fellowship is prohibited and outlined on pg. 15 of the administrative guide for the Postdoctoral Research Fellowships in Biology program: https://www.nsf.gov/pubs/2021/nsf21081/nsf21081.pdf		
Adjunct Faculty of Record, Georgetown College, KY, USA		2019-2020
BIO 100: Introductory Biology for Non-Majors (100% Remote Learning)		
I section	75 min/class	24 students
		Four/week
		Summer 2020
BIO 111: Introductory Biology for Majors		
I section	75 min/class	24 students
		Twice/week
		Fall 2019
BIOL 111: Introductory Biology Lab		
I section	110 min/class	24 students
		Once/week
		Fall 2019
Invited Group Lecturer for Biotechnology Methods, University of Louisville, KY, USA		2018
BIOL 416: Biotechnology Methods		
2 sections	240 min/class	4 students
		Twice/week
		Fall 2018
Teaching Innovation Learning Lab for Microbiology, University of Louisville, KY, USA		2017-2019
BIO 357: General Microbiology		
I section	75 min/class	64 students
		Eight/Semester
		Fall 2019
BIO 357: General Microbiology		
I section	75 min/class	49 students
		Four/Semester
		Fall 2018
BIO 357: General Microbiology		
I section	75 min/class	43 students
		Four/Semester
		Spring 2018
BIO 357: General Microbiology		
I section	75 min/class	65 students
		Four/Semester
		Fall 2017
Graduate Teaching Assistant, University of Louisville, KY, USA		2015-2020
BIOL 331: Genetics and Molecular Biology		
2 sections	110 min/class	20 & 20 students
		Twice/week
		Spring 2020
BIOL 331: Genetics and Molecular Biology		
2 sections	110 min/class	20 & 22 students
		Twice/week
		Fall 2019

BIOL 33I: Genetics and Molecular Biology	2 sections	110 min/class	20 & 22 students	Twice/week	Spring 2019
BIOL 33I: Genetics and Molecular Biology	1 section	110 min/class	19 students	Twice/week	Fall 2018
BIOL 104: introduction to Biological Systems	2 sections	110 min/class	14 students	Three/week	Summer 2018
BIOL 33I: Genetics and Molecular Biology	2 sections	110 min/class	20 & 21 students	Twice/week	Spring 2018
BIOL 33I: Genetics and Molecular Biology	1 section	110 min/class	8 students	Twice/week	Fall 2017
BIOL 258: Microbiology	2 sections	90 min/class	15 & 6 students	Four Days/week	Summer 2017
BIOL 33I: Genetics and Molecular Biology	2 sections	110 min/class	17 & 21 students	Twice/week	Spring 2017
BIOL 33I: Genetics and Molecular Biology	1 section	110 min/class	16 students	Twice/week	Fall 2016
BIOL 244: Principles of Biology	2 sections	110 min/class	27 & 28 students	Twice/week	Spring 2016
BIOL 104: introduction to Biological Systems	3 sections	110 min/class	33, 33, & 33 students	Once/week	Fall 2015

HONORS AND AWARDS

UU News: MSCA Fellowships for five Utrecht University researchers – Utrecht, NL	2023
https://www.uu.nl/en/news/marie-sklodowska-curie-actions-fellowships-for-five-utrecht-university-researchers	
UCF Today: Stories of Impact + Innovation Spotlight – UCF, FL, USA	2021
https://www.ucf.edu/news/ucf-doctoral-scholar-named-national-science-foundation-biology-fellow/	
Graduate Dean's Citation – UofL, KY, USA	2020
Graduate Student Publication Award – UofL, KY, USA	2020
Graduate School of Arts and Sciences Student Spotlight – UofL, KY, USA	2020
https://louisville.edu/graduate/student-spotlight/student-spotlight-february-2020	
Introductory Biology Lab Development Award – UofL, KY, USA	2019
Graduate Student Research Presentation Award – UofL, KY, USA	2019
Biology Department Service Award – UofL, KY, USA	2019
College of Arts and Science Student Profile – UofL, KY, USA	2016
https://louisville.edu/artsandsciences/academics/graduate-education/student-profiles/beckerson	

COMMUNITY INVOLVEMENT / OUTREACH

Community Science Initiative: the **Zombie Fungus Foray**, Orlando US

-Creator-

hyperlinks imbedded in the logos

Website: <https://thezombiefungusforay.com>

Twitter: <https://twitter.com/ZombieANTics>

iNaturalist: <https://www.inaturalist.org/projects/the-zombie-fungus-foray>



K-12 Classroom Outreach:

2022	Amsterdam International Community School – Amsterdam, NL
2021	Wharton High School: National Honor Society – Tampa, FL, USA
	Freedom High School: Environmental Science Periods I-7 – Tampa, FL, USA
	Wharton High School: SPLASH Club, and Biology Sections I-6 – Tampa, FL, USA
	Mica Mountain High School: Sections III & VI – Tucson, AR, USA
2020	Jackson Heights Middle School: Ecology – Oviedo, FL, USA
	Oviedo High School: Sophomore Biology Sections 2, 3, 6, & 7 – Oviedo, FL, USA
	Oviedo High School: AP Biology Sections I & II – Oviedo, FL, USA



iNaturalist Curator:

2020-current	Website curator for the <i>Ophiocordyceps unilateralis</i> species complex
2020	The Zombie Fungus Foray Project Creator



Seminole County Parks Partnership:

2021	Chuluota Wilderness Area Guided Hike for Zombie Ants – Geneva, FL, USA
2021	Eco Camp: Grossology Week Guide to Zombie Ants – Geneva, FL, USA
2021	Eco Camp: Biology Bootcamp Guide to Zombie Ants – Geneva, FL, USA



Orlando Science Center Partnership:

2022	Otronicon: 3-day Alpha testing of ZombieAntVR with kids – Orlando, FL, USA
2021	Pumpkins and Protons Halloween Party Exhibit – Orlando, FL, USA
2019	Spooky Science Week Exhibit: Real-life Zombie Ants! – Orlando, FL, USA



stemCONNECT Partnership:

2021	Spooky Themed Month Virtual Presentation – Orlando, FL, USA
	Real-life Zombies and Where to Find Them
2021	EARTH DAY Virtual Presentation – Orlando, FL, USA
	Real-life Zombies and Where to Find Them



TikTok:

2021	@TheZombieFungusForay https://www.tiktok.com/@thezombiefungusforay?lang=en
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ZombieAntVR:

2022	UCF Gains in the Education of Math and Science Summer Camp – Orlando, FL, USA
	VR project demo for Weeks 1-2, 4-5: grades 5 th – 8 th
2020-2022	A virtual reality video game about the <i>Ophiocordyceps</i> life cycle. Project coordinator, story designer, voice director.

Other Outreach:

Adaptation of our published research for Science Journal for Kids and Teens – TX, USA	2023
https://www.sciencejournalforkids.org	
Guest on Val 202's Frekvencia X show about "The Last of Us" – SI	2023
https://val202.rtvsllo.si/podcast/frekvencia-x/31057643/1749+I558	
Guest on NPR's The Colin McEnroe Show about "The Last of Us" – CT, USA	2023
https://www.ctpublic.org/show/the-colin-mcenroe-show/2023-02-06/the-fungus-among-us	
Correspondent for Inverse on the science behind "The Last of Us" – NY, USA	2023
https://www.inverse.com/science/last-of-us-hbo-zombie-science	
Correspondent for Newsweek on the science behind "The Last of Us" – NY, USA	2023
https://www.newsweek.com/cordyceps-fungus-zombie-last-us-real-hbo-1774684	

Orlando Taste of Science - Science Festival, Scientists Inc. – FL, USA	2022
Real-life Zombies and Where to Find Them	
 TikTok:	2021
@aBitofBiology https://www.tiktok.com/@abitofbiology	
Orlando MegaCon Panelist – FL, USA	2021
The Last Damn Zombie Science Panel You'll Ever Need!	
Interview a Biologist – VT, USA	2021
with Stacey Grimaldo Garcia of Middlebury College	
Skype a Scientist Live: Orlando – FL, USA	2021
Spooky Science: Real Life Zombies and Where to Find Them	
https://www.youtube.com/watch?v=7WGJZG4DjjQ	
Beer with a Scientist: Monnik Beer Company – KY, USA	2020
Our Friends the Fungi: The many types of fungi and the history of how we've used them	
Skype a Scientist	2019-2021
2020 Creekside Middle School: Sixth Grade Class – Bentonville, AR, USA	
2019 Marie Curie Institute: Fourth and Fifth Grade Class – Amsterdam, NY, USA	
Corry Area High School: Ninth Grade Class – Corry, PA, USA	
Newark Central: Second Grade Class – Newark, NY, USA	
E.K. Powe Elementary School: First Grade Class (AKA the Sea Crew) – Durham, NC, USA	
Annunciation Catholic School: Seventh Grade Class – Denver, CO, USA	
Guest Speaker at University of Louisville: Meet the Professor – KY, USA	2019
Science Information Literacy & Oral Communication	
Guest Speaker at Lexington Christian Academy High School – KY, USA	2018
The history of genetic modification of our food	
Guest Speaker at Lexington Christian Academy High School – KY, USA	2016
What is a GMO?	
ExBEERiment: Socialize with Science at the Louisville Science Center – KY, USA	2016
The science of brewing beer	

LANGUAGE PROFICIENCIES

English

ILR level 5 – Native Proficiency

Dutch

ILR level 2 – Limited Working Proficiency

Spanish

ILR level I – Elementary Proficiency

REFERENCES

Dr. Charissa de Bekker	University of Central Florida, USA/ PI	Charissa.debekker@ucf.edu
Dr. Michael Perlin	University of Louisville, USA/ PI	Michael.perlin@louisville.edu
Dr. Tatiana Giraud	Université Paris-Sud, FR/ Collaborator	Tatiana.giraud@u-psud.fr
Dr. Dominik Begerow	Ruhr-Universität Bochum, DE/ Collaborator	Dominik.begrow@rub.de
Dr. Scott Gold	USDA Georgia, USA/ Committee Member	Scott.gold@ARS.USDA.Gov