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

Contact Information:

w.c.beckerson@uu.nl

Research:

0000-0001-7132-7578

WCBeckerson/

Socials:

@WCBeckerson

@WilliaMycete

@aBitofBiology

Languages: (CEFR)

English - Native

Spanish - A2

Dutch - A1

What is CEFR?

EDUCATION

University of Louisville - Louisville, KY, USA 2015-2020
Doctor of Philosophy in Biology

University of Louisville - Louisville, KY, USA 2015-2017
Master of Science in Biology

Georgetown College - Georgetown, KY, USA 2009-2013
Bachelor of Science in Biology / Minor: Business Management

RESEARCH EXPERIENCE

Postdoctoral Research:

EC: Marie Skłodowska-Curie Action Postdoctoral Fellowship Awardee
Utrecht University, Utrecht, NL 2023-2025
PI: Sander van den Heuvel
Research project title: Characterizing the neuronal effects of *Ophiocordyceps* secreted proteins using *C. elegans*.

NSF: Postdoctoral Research Fellowship in Biology Awardee
University of Central Florida, FL, USA 2021-2023
PI: Charissa de Bekker
Research project title: Linking parasite genomes, environmental ques, and host phenomes in *Ophiocordyceps*.

Dissertation Research:

Ruhr-Universität Bochum, Bochum, DE 2018-2019
Collaborator: Dominik Begerow
Research project title: Implementation of CRISPR Cas9 in *Microbotryum lychnidis-dioicae*.

AdF: Chateaubriand Fellowship Awardee
Université Paris-Sud, Orsay, FR 2016-2018
Collaborator: Tatiana Giraud
Research project title: Comparative genomics of species-specific effectors in the *Microbotryum genus*.

University of Louisville, KY, USA 2015-2020
PI: Michael Perlin
Research project title: Molecular analysis of secreted proteins in the *Microbotryum* genus.

Pedagogical Research:

University of Louisville, KY, USA 2017-2021
PI: Deborah Yoder-Himes
Research project title: Analyzing the impact of active learning on different 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* In Press, Corrected Proof. https://doi.org/10.1016/j.anbehav.2023.06.011

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 Award number (FAIN): 2109435	($138,000)	2021
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: 1824851

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 *Microbotryum* 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 *Microbotryum* 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 *Microbotryum* 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 *Microbotryum* 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

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 31st 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	2 papers	2022-2023
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)

1 section	75 min/class	24 students	Four/week	Summer 2020

BIO 111: Introductory Biology for Majors

1 section	75 min/class	24 students	Twice/week	Fall 2019

BIOL 111: Introductory Biology Lab

1 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

1 section	75 min/class	64 students	Eight/Semester	Fall 2019

BIO 357: General Microbiology

1 section	75 min/class	49 students	Four/Semester	Fall 2018

BIO 357: General Microbiology

1 section	75 min/class	43 students	Four/Semester	Spring 2018

BIO 357: General Microbiology

1 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 331: Genetics and Molecular Biology

2 sections	110 min/class	20 & 22 students	Twice/week	Spring 2019

BIOL 331: 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 331: Genetics and Molecular Biology

2 sections	110 min/class	20 & 21 students	Twice/week	Spring 2018

BIOL 331: 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 331: Genetics and Molecular Biology

2 sections	110 min/class	17 & 21 students	Twice/week	Spring 2017

BIOL 331: 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 1-7 – Tampa, FL, USA
	Wharton High School: SPLASH Club, and Biology Sections 1-6 – 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 *Ophiocordyceps unilateralis* 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

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 5th – 8th
2020-2022	A virtual reality video game about the *Ophiocordyceps* 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 Frekvenca X show about "The Last of Us" – SI 2023
https://val202.rtvslo.si/podkast/frekvenca-x/31057643/174941558

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 Middleburry 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
Spanish
CEFR level A1.2 – Elementary Proficiency
Dutch
CEFR level A1.1 – Limited Working Proficiency
*What is "Common European Framework of Reference (CEFR)?"

REFERENCES

Dr. Charissa de Bekker	University of Central Florida, USA/ PI	*A.m.debekker@uu.nl*
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*