

Theresa A. Spradling
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Present Position:

Professor and Head of Department of Biology
University of Northern Iowa
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Education:

- Ph.D., Louisiana State University, Baton Rouge, Department of Zoology & Physiology. Dissertation: "Relative rates of molecular evolution in rodents and their symbionts", 1997.
- M.S., University of North Texas, Denton. Thesis: "Mitochondrial DNA restriction site analysis of the phylogeny of the *truei* and *boyllyi* species groups of the rodent genus *Peromyscus* (Cricetidae)", 1991.
- B.S., Emporia State University, Emporia, KS. Major in biology, minor in chemistry. Graduated *magna cum laude*, 1988.

Position History:

- Hired as Adjunct faculty at UNI in 1998
- Hired as Assistant Professor at UNI in 2001
- Promoted to Associate Professor at UNI in 2005
- Promoted to Professor at UNI 2012
- Interim Department Head, Department of Biology at UNI 2018-2019
- Department Head, Department of Biology at UNI, August 2019 to present

Recent Awards:

- Regents Award for Faculty Excellence 2018—an award for meritorious accomplishment in research, teaching, and service

Research

Highlights:

- Research focus: genetics of the evolutionary process at the population level and at the macroevolutionary level, including host-parasite cospeciation
- 31 peer-reviewed scientific publications, 28 based on original research in journals with international readership: *Molecular Ecology*, *Conservation Genetics*, *Journal of Mammalogy*, *Journal of Parasitology*, *PLoS One*, *Molecular Phylogenetics and Evolution*, *Journal of Molecular Evolution*, and *Science*, plus 3 book chapters (one original research, two synthetic)
- Impactful research: 1,554 Google Scholar citations of work; 5,219 article reads through ResearchGate
- Over \$150,000 in funding for research at UNI through 3 external grants, including National Science Foundation.
- Over \$60,000 in Internal (UNI) funding in support of research.

Scientific Publications—Refereed journal articles, *UNI students, Impact Factor (IF):

- [1] 2021: Spradling, T. A., A. C. Place*, A. L. Campbell*, and J. W. Demastes. Mitochondrial Genome of *Geomydoecus aurei*, a Pocket- Gopher Louse. *PLoS ONE* 16(7):e0254138.
- [2] 2019: Hafner, D. J., M. S. Hafner, T. A. Spradling, J. E. Light, and J. W. Demastes. Temporal and spatial dynamics of competitive parapatry in chewing lice. *Ecology and Evolution*, 9:7410-7424.
- [3] 2019: Poppinga, A. *, J. W. Demastes, T. A. Spradling, D. J. Hafner, and M. S. Hafner. Host-parasite associations of the *Cratogeomys fumosus* species group and their chewing lice, *Geomydoecus*. *Therya*, 10: 81-89.
- [4] 2019: Demastes, J. W., D. J. Hafner, M. S. Hafner, J. E. Light, and T. A. Spradling. Loss of genetic diversity, recovery, and allele surfing in a colonizing parasite, *Geomydoecus aurei*. *Molecular Ecology*, 28:703-720.
- [5] 2018: Light, J. E., S. E. Harper*, K. Johnson, J. W. Demastes, and T. A. Spradling. Development and Characterization of 12 Novel Polymorphic Microsatellite Loci for the Mammal Chewing Louse *Geomydoecus aurei* (Insecta: Phthiraptera) and a Comparison of Next-Generation Sequencing Approaches for Use in Parasitology. **Journal of Parasitology**, 104: 89-95, <https://doi.org/10.1645/17-130>.
- [6] 2016: Pietan*, L. L., T. A. Spradling, and J. W. Demastes. The mitochondrial cytochrome oxidase subunit I gene occurs on a minichromosome with extensive heteroplasmy in two species of chewing lice, *Geomydoecus aurei* and *Thomomydoecus minor*. **PLoS One**, 11(9): e0162248.
- [7] 2016: Spradling, T. A., J. W. Demastes, D. J. Hafner, P. L. Milbach*, F. A. Cervantes, and M. S. Hafner. Systematic revision of the pocket gopher genus *Orthogeomys*. **Journal of Mammalogy**, 97(2): 405-423.
- [8] 2015: Harper, S. E. *, T. A. Spradling, J. W. Demastes, and C. S. Calhoun*. Host behaviour drives parasite genetics at multiple geographic scales: population genetics of the chewing louse, *Thomomydoecus minor*. **Molecular Ecology**, 16 pp.
- [9] 2014: Hafner, M. S., D. J. Hafner, E. E. Gonzáles, J. W. Demastes, T. A. Spradling, and F. A. Cervantes. 2014. Rediscovery of the pocket gopher *Orthogeomys lanius* (Rodentia: Geomyidae) in Veracruz, Mexico. **Journal of Mammalogy**, 95:792-802.
- [10] 2013: Whitmore, S. S. *, S. Losee*, L. Meyer*, and T. A. Spradling. Conservation genetics of the central newt (*Notophthalmus viridescens*) in Iowa: The importance of a biogeographic framework. **Conservation Genetics**, 14:771-781.
- [11] 2012: Demastes, J. W., T. A. Spradling, M. S. Hafner, G. R. Spies*, D. J. Hafner, and J. E. Light. Cophylogeny on a fine scale: *Geomydoecus* chewing lice and their pocket gopher hosts, *Pappogeomys bulleri*. **Journal of Parasitology**, 98:262-270.
- [12] 2010: Spradling, T. A., J. W. Tamplin, S. S. Dow*, and K. J. Meyer*. Conservation genetics of a peripherally isolated population of the wood turtle (*Glyptemys insculpta*) in Iowa. **Conservation Genetics**, 11:1667–1677.
- [13] 2009: Hafner, M. S., D. J. Hafner, J. W. Demastes, G. L. Hasty, J. E. Light, and T. A. Spradling. Evolutionary relationships of pocket gophers of the genus *Pappogeomys* (Rodentia: Geomyidae). **Journal of Mammalogy**, 90:47-56.
- [14] 2008: Hafner, D. J., M. S. Hafner, G. L. Hasty, T. A. Spradling, and J. W. Demastes. Evolutionary relationships of pocket gophers (*Cratogeomys castanops* species group) of the Mexican Altiplano. **Journal of Mammalogy**, 89:190-208.

Scientific Publications—Refereed journal articles continued:

- [15] 2007: Eastman*, J. T. A. Spradling, J. W. Demastes, and H. Hadow. Conservation genetic assessment of the blue-spotted salamander in Iowa. **American Midland Naturalist**, 158:233-239.
- [16] 2005: Hafner, M.S., J. E. Light, D. J. Hafner, S. V. Brant, T. A. Spradling, and J. W. Demastes. Cryptic species in the Mexican pocket gopher, *Cratogeomys merriami*. **Journal of Mammalogy**, 86:1095–1108.
- [17] 2004: Spradling, T. A., S. V. Brant, M. S. Hafner, and C. J. Dickerson*. DNA data support a rapid radiation of pocket gopher genera (Rodentia: Geomyidae). **Journal of Mammalian Evolution**, 11: 105-125.
- [18] 2004: Hafner, M. S., T. A. Spradling, J. E. Light, D. J. Hafner, and J. R. Demboski. Systematic revision of pocket gophers of the *Cratogeomys gymnurus* species group. **Journal of Mammalogy**, 85: 1170-1183.
- [19] 2002: Demastes, J. W., T. A. Spradling, M. S. Hafner, D. J. Hafner, and D. L. Reed. Systematics and phylogeography of pocket gophers in the genera *Cratogeomys* and *Pappogeomys*. **Molecular Phylogenetics and Evolution**, 22: 144-154.
- [20] 2001: Spradling, T. A., M. S. Hafner, and J. W. Demastes. Differences in rate of cytochrome *b* evolution among species of rodents. **Journal of Mammalogy**, 82:65-80.
- [21] 1999: Nevo, E., A. Beiles, and T. A. Spradling. Molecular evolution of cytochrome *b* of subterranean mole rats, *Spalax ehrenbergi* superspecies, in Israel. **Journal of Molecular Evolution**, 49:215-226.
- [22] 1998: Demastes, J. W., M. S. Hafner, D. J. Hafner, and T. A. Spradling. Pocket gophers and chewing lice: A test of the maternal transmission hypothesis. **Molecular Ecology**, 7:1065-1069.
- [23] 1998: Hafner, M. S., J. W. Demastes, D. J. Hafner, T. A. Spradling, P. D. Sudman, and S. A. Nadler. Age and movement of a hybrid zone: implications for dispersal distance in pocket gophers and their chewing lice. **Evolution**, 52:278-282.
- [24] 1996: J. V. Planz, E. G. Zimmerman, T. A. Spradling, and D. R. Akins. Molecular phylogeny of the *Neotoma floridana* species group. **Journal of Mammalogy**, 77:519-535.
- [25] 1994: M. S. Hafner, P. D. Sudman, F. X. Villablanca, T. A. Spradling, J. W. Demastes, and S. A. Nadler. Disparate rates of molecular evolution in cospeciating hosts and parasites. **Science**, 265:1087-1090.
- [26] 1993 T. Spradling DeWalt, P. D. Sudman, M. S. Hafner, and S. K. Davis. Phylogenetic relationships of pocket gophers (*Pappogeomys* and *Cratogeomys*) based on mitochondrial DNA cytochrome *b* sequences. **Molecular Phylogenetics and Evolution**, 2:193-204.
- [27] 1993: T. Spradling DeWalt, E. G. Zimmerman, and J. V. Planz. Mitochondrial-DNA phylogeny of species of the *truei* and *boylei* groups of the genus *Peromyscus*. **Journal of Mammalogy**, 74:352-362.
- [28] 1991: C. T. McAllister, S. J. Upton, J. V. Planz, and T. Spradling DeWalt. New host and locality records of *Coccidia* (Apicomplexa: Eimeriidae) from rodents in the southwestern and western United States. **Journal of Parasitology**, 77:1016-1019.
- [29] 1989: T. A. Tims, J. K. Frey, T. A. Spradling, and D. W. Moore. A new locality for the pygmy shrew (*Sorex hoyii winnemana*) in Tennessee. **Journal of Tennessee Academy of Science**, 64.

Scientific Publications—Book Chapters (Original research):**

- [30] 2003: Demastes, J. W., T. A. Spradling, and M. S. Hafner. The Effects of Spatial and Temporal Scale on Analyses of Cophylogeny. *In Tangled trees: Phylogeny, Cospeciation, and Coevolution* (R.D.M. Page, ed.), **Univ. of Chicago Press**, 221-239.**
- [31] 2003: Hafner, M. S., J. W. Demastes, T. A. Spradling, and D. L. Reed. Cophylogeny Between Pocket Gophers and Chewing Lice. *In Tangled trees: Phylogeny, Cospeciation, and Coevolution* (R.D.M. Page, ed.), **Univ. of Chicago Press**, 195-220.
- [32] 2000: Hafner, M. S., J. W. Demastes, and T. A. Spradling. Coevolution. *In Life Underground: The Biology of Subterranean Rodents* (E. Lacey, J. L. Patton, and G. N. Cameron, eds.), **Univ. of Chicago Press**, 370-388.

External Funding for Research at UNI (Total = \$154,024 for Research):

- 2014: **National Science Foundation**. EAGER: Testing geographic range-expansion models: Population genetics of a colonizing parasite. (Demastes, Spradling, and Light). **\$149,937—This program only funded 7.5% of the proposals it received at the time we were awarded.**
- 2009: **Iowa DNR Wildlife Diversity Program**. “Conservation genetics of the central newt in Iowa.” **\$2,500**
- 1999: **Iowa Department of Natural Resources** (with J. W. Demastes). \$1,587. “Survey of the Bats of White Pine Hollow Preserve.”

Selected Internal Awards in Support of Research (Total over \$60,000):

- **Capacity Building Grant**. Analysis of a fragmented mitochondrial genome in chewing lice. 2018 (\$8,191).
- **Professional Development Assignment**, Spring 2016, Testing geographic range-expansion models: Population genetics of a colonizing parasite.
- **University of Northern Iowa Summer Fellowship (Graduate College)**. 2014 (\$3,253), 2010 (\$3,000), 2002 (\$3,000).
- **University of Northern Iowa Seed Grant (OSP/Provost)**. 2013 (\$3,000), 2010-2012 (\$15,000).
- **SOAR Award in support of student research (College of Natural Science and/or CHAS)**, 2016 (\$750), 2010 (3 awards, \$2,250), 2009 (\$750), 2008 (\$750), 2007 (3 awards, \$1,253), 2006 (\$472), 2004 (\$500), 2003 (3 awards, \$1,500), 2002 (2 awards, \$1,000).
- **GRASP Award in support of graduate student research (College of Natural Science and/or CHAS)**, 2010 (\$750), 2009 (\$750), 2008 (\$750), 2004 (\$500)
- **Swanson Genetics Award in support of student research**, 2016 (\$500), 2009 (\$500), 2008 (\$500).
- **Intercollegiate Academic Fund Research awards**, 2014 (\$647), 2012 (\$400), 2010 (\$400), 2009 (2 awards, \$800), 2008 (2 awards, \$800).
- **Undergraduate Research Associate (UGRA or Floyd Award, Biology department awards in support of research)**, 2010, 2008, 2007 (2 awards), 2003 (3 awards); approximately \$14,000.
- **Orr Award in support of undergraduate research (Biology department)**, 2016 (\$1,000), 2007 (\$500), 2003 (\$1000).
- **UNI EPSCoR funding (OSP/Provost)**, 2012 (\$1,500),
- **UNI Capacity Building funding (CHAS)**, 2013 (\$1,000).

Memberships in Professional Organizations:

- American Society of Mammalogists
- International Society of Phthirapterists* (* = people who study lice)
- Genetics Society of America

Selected Research Presentations:

- [1] 2017: Invited seminar, **Geography Department Colloquium (College of Social and Behavioral Sciences)**. “Testing geographic range-expansion models: Population genetics of a colonizing parasite”.
- [2] 2017: **National Council on Undergraduate Research**, Memphis, TN. J.S. Hill, J.W. Demastes, and T.A. Spradling. “Geographic distribution of nuclear and mitochondrial genetic patterns in pocket gophers at a subspecies-hybrid zone in New Mexico”.
- [3] 2016 **National Council on Undergraduate Research**, Asheville, NC. L. Pietan, J.W. Demastes, and T.A. Spradling. “Minicircles and heteroplasmy in the mtDNA of a parasitic insect”.
- [4] 2014: **International Conference of Phthirapterists 5 Meeting**, Park City, UT. S.E. Harper, C.S. Calhoun, J.W. Demastes, and T.A. Spradling. “Population genetics of *Thomomydoecus minor*, a chewing louse of pocket gophers in the Rio Grande Valley of New Mexico.

Teaching

Highlights:

- Over \$1,053,000 in funding for teaching at UNI
- Consistently high teaching evaluations
- Mentored more than 40 research students while tenure track, publishing research with 12 UNI students

Teaching Responsibilities at UNI:

- Genetics (sophomore-level core biology course)
- Evolutionary Biology
- Advanced Systematics and Evolution (course for graduate students)
- Organismal Diversity lab (freshman core class)

External Funding for Education (**Total = \$838,327**):

- **2021 Roy J. Carver Charitable Trust.** “*Furthering Connections Between Core Curriculum Classes for Biology and Pre-Health Students Through Microscopy*” (I was lead of 5 collaborators). **\$253,130**
- **2019 Roy J. Carver Charitable Trust.** “*Enhancing Hands-on Training in Genetics and Genomics*” (I was one of 6 collaborators). **\$239,825**
- **2011 Roy J. Carver Charitable Trust.** “Department of Biology Microscopy and Image Analysis Facility” (I was one of 5 collaborators). **\$358,502**
- **2009 Roy J. Carver Charitable Trust.** “Renovation and Modernization of Introductory Freshman and Sophomore Core Biology Laboratory Courses” (I was one of 5 collaborators). **\$240,000**

Graduate* and Undergraduate Thesis committees:

Rebecca Richtsmeier (2005)*, Mark Wilcox (2005)*, Cydney Brooks (2009)*, Jade East (2010)*, Kelsey Lees (2010)*, Dane Davis (2011)*, Corinthia Black (2013)*, Samuel Berg (2013)*, Jamie Minnaert-Grote (2013)*, Jason Ratcliff (2014)*, Renee DeVries (2004), Alexa Warwick (2008), Jeremiah Feltz (2008), Alex Poppinga (2013), Alex Place (2019), Brett Gourley (2021)

Mentoring (Number of Semesters, Research Awards Received, * = student coauthor on scientific publication, ** PhD or equivalent):

1. Chris Dickerson*, 2001-2003 (4 semesters, *coauthor)
2. Gayle Lundy, 2002 (1 semester)
3. Amy Buhr, 2003 (2 semesters)
4. Kacie Johnston Meyer*, 2003-2004, 2004-2005 (4 semesters, SOAR, UGRA Award, Orr Award, *coauthor, Ph.D.***, currently research scientist at University of Iowa)
5. Renee Pasker, 2003-2004, 2004-2005 (4 semesters, SOAR, UGRA Award, currently researcher at UW Madison Carbone Cancer Center)
6. Ann Schwemm, 2004-2005 (2 semesters, SOAR, UGRA Award)
7. Julie Brown, 2004-2005 (University Honors Program research advisor)
8. John Eastman*, 2004-2005 (MS, GRASP Award, *coauthor, Ph.D.** at University of Washington, postdoc at University of Idaho)
9. Abby Waychoff, 2005 (1 semester)
10. Vinay Bajaj, 2006 (1 semester, SOAR)
11. Jim Mason, 2007 (1 semester, SOAR)
12. Scott McNaughton, 2007 (1 semester, SOAR)
13. Frederico Silva, 2007-2008 (2 semesters, UGRA Award, Orr Award)
14. Samantha Enabnit Dow*, 2007-2009 (4 semesters, UGRA Award, Floyd Award, SOAR Award, IAF Research Award, Swanson Genetics Award, Biology Thesis, *coauthor, completed PharmD** at University of Iowa)
15. S. Scott Whitmore*, 2008-2010 (MS) (GRASP Award, IAF Research Award, First place award for poster at Graduate College Symposium, April 2010, *coauthor, Ph.D.** at University of Iowa, currently postdoctoral scholar)
16. Abdullellah Alsheddi, 2008 (2 semesters, IAF Research Award)
17. Selena Losee*, 2009-2010 (2 semesters, SOAR Award, Swanson Genetics Award, UGRA Award, First place award for undergraduate Sigma Xi poster, *coauthor, currently **DO student at DMU)
18. Lauren Dougall, 2010 (1 semester)
19. Shantra Nuehring, 2010, (1 semester, currently DO**)
20. Kayla Peiffer, 2010-2011 (3 semesters, SOAR Award, now medical lab scientist at Mercy Medical)
21. Sheree Harper, 2010-2011 (2 semesters, SOAR Award, later earned MS with me)
22. Laurel Meyer*, 2010-2011 (2 semesters, SOAR Award, *coauthor, currently in PharmD** program)
23. Courtney Calhoun*, 2011-2013 (4 semesters, IAF Research Award, Biology Thesis, *coauthor)
24. Alex Poppinga, 2011-2013 (4 semesters, currently Ph.D. ** at University of Aukland)
25. Paige Milbach, 2011-2013 (4 semesters, *coauthor, currently in PharmD** program)
26. Sheree Harper, 2011-2013 (MS, GRASP Award, *coauthor)
27. Dane Davis, 2011-2013 (committee member)
28. Jared Parmater, 2013-2014 (2 semesters, currently completing MS in biology)
29. Dalton Ebel, 2013-2014 (3 semesters, IAF Research Award, currently in medical school)
30. Amy Bowers, 2013 (2 semesters, currently in medical school)
31. Laura Cross, 2013-2014 (2 semesters, now a genetic counselor)
32. Carli Freese, 2014 (2 semesters)
33. Reva Bork, 2014-2015 (University honors research)
34. Emily Ament, 2015 (1 semester, NSF grant research, now at Integrated DNA Technologies)
35. Brian Ross, 2016 (1 semester, NSF grant research, currently in graduate program in biology)
36. Sarah Huebner, 2016 (1 semester, NSF grant research, currently in PhD program in biology, UMN)
37. Jillian Hill, 2015-2017 (4 semesters, SOAR Award, Orr Research Award, Swanson Genetics Award, NSF grant research, presenting at NCUR 2017, Biology senior thesis Spring 2018)

38. Lucas Pietan, 2015-2016 (3 semesters, Biology Thesis, presentation at NCUR 2016 *coauthor)
39. Isabella Harper, 2015-2016 (2 semesters, high school student)
40. Lauren Billings, 2016 (2 semesters and continuing)
41. Natalie Espinosa, 2016-2017 (3 semesters)
42. Wyatt Anderson, 2016-2017 (2 semesters)
43. Alex Place, 2018-2019 (MS) (3 semesters)

Service and Community Outreach

Highlights:

- Regularly solicited as a reviewer for scientific grants and publications
- Active in service to UNI, the profession of biology, and our community

Community Outreach:

- Taught a 10-week session on genetics to Waterloo Study Club #1 (Fall 2013)
- Science Reviewer for Junior First Lego League (2014)
- Speaker at Darwin Week for UNI Freethinkers and Inquirers (UNIFI, 2012)
- Taught at the Bromann Biology Update for high school biology teachers

Service at UNI (College or University):

- Member of Search Committee, Department of Chemistry and Biochemistry (2021)
- Scholarly Communications Committee with Rod Library (2017-2018)
- Educational Technology and Media Services Committee (2016-2017)
- Speaker for Geography Department Graduate Colloquium (2017)
- Dean's Advisory Committee on Promotion and Tenure (2013)
- College Merger Steering Committee (3 semesters, spring 2010-spring 2011)
- College work group on Support for Student Research/Creative Activity (2010)
- CNS Senate Alternate (6 years)

Service at UNI (Biology Department)—selected items:

- Chaired 5 Search Committees for faculty
- Biology Scholarship Committee (10 years)
- Professional Assessment Subcommittee (6 years)
- Publicity Committee (9 years)
- Pre-occupational Therapy Club advisor (2011-2018)
- Multi-time Participant with Biology Living and Learning Community

Service as a Scientific Reviewer—selected items:

- National Science Foundation, Evolution, Conservation Genetics, Molecular Ecology, Journal of Mammalogy, Biological Journal of the Linnaean Society, Infection, Genetics, & Evolution