

## CURRICULUM VITAE

**CARL LEO THURMAN II**  
**Department of Biology**  
**University of Northern Iowa**  
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04/24

### I. EDUCATION AND DEGREES

Senior Postdoc. - Universidade de São Paulo, Ribierão Preto, Brazil (2009)  
- The University of Nebraska Medical Center - Omaha (2003)  
- The University of Texas Medical School at Houston(1990;1999)  
Junior Postdoc. - The Medical College of Ohio at Toledo (1979 -1983)  
Ph.D. - University of Minnesota (Zoology) May 1980  
M.S. - University of West Florida (Biology)  
B.S. - University of Houston (Biology)

### II. ACADEMIC POSITIONS

Visiting Scientist, Center for Marine Biology, Universidade de São Paulo (CEBIMAR), Ribierão Preto, SP, Brazil. May to November 2009; May to August, 2010.

Professor, Department of Biology, University of Northern Iowa, Cedar Falls, IA, July 2006 to present.

Visiting Scientist, University of South Carolina -Belle Baruch Marine Laboratory, June-July, 2005.

Visiting Associate Professor/Faculty, Department of Physiology and Biophysics, University of Nebraska Medical School - Omaha. August 1, 2003 - July 31, 2004.

Visiting Associate Professor/Faculty, Department of Integrative Biology, Pharmacology and Physiology, University of Texas - Houston Medical School, July 1, 1999 - August 6, 2000.

Associate Professor, Department of Biology, University of Northern Iowa, Cedar Falls, IA. July 1998-June 2006.

Assistant Professor, Department of Biology, University of Northern Iowa, Cedar Falls, IA. September 1992-June 1998.

Assistant Professor, Department of Biology and Continuing Education, University of Missouri-St. Louis. September 1989 - August 1992.

Research Affiliate, Department of Ophthalmology, Washington University School of Medicine, St. Louis, MO. 1984-1989.

Visiting Assistant Professor, Department of Biology and Continuing Education, University of Missouri-St. Louis. August 1983 - September 1989.

Instructor, Department of Pharmacology and Department of Medicine, The Medical College of Ohio, September 1982 - August 1983.

Teaching Associate, Department of Medicine, The Medical College of Ohio. 1981 - 1982.

Instructor, Department of Biology, Moorhead State University, MN. September 1978 - May 1979.

Graduate Teaching Assistantships: September 1969 - March 1978.

The University of West Florida:

Molecular Biology                      Instrumental Biophysics

The University of Minnesota:

Tropical Reef Biology                      General Physiology                      Invertebrate Zoology  
Evolution                                      Animal Biology                              Introduction to Zoology  
General Biology                              Histology                                      Comparative Animal Physiology

### III. CONSULTANT/ADVISORY POSITIONS

Fulbright U.S. Scholar Program, Institute of International Education, Peer Review Team (August 2017).

Center for Global and Regional Environmental Research, member, University of Iowa, Advanced Technology Laboratories, Iowa City. (April 2017)

Strategies for Success: *Following the Nobel path: physiology exercises that inspire!* A Benjamin-Cummings Teaching Workshop. Boone, IA (April 2005).

John Shedd Aquarium, Chicago, IL. Exhibit consultant, *The Evolution of Terrestrial Crabs* (June, 2005).

British Broad Casting Network. *The Time Machine: A Race against Time*. Tidal rhythms in crabs program (Oct 2003-Mar 2004).

U.S. National Park Service. Palo Alto Battlefield National Historic Site - Ecology Displays (Mar 2002).

Howard Hughes Research Foundation- Rhythms in *Uca* demonstration (Dec. 2000).

Instructor/Advisor, National Science Foundation - Chatauqua Course in *Neurobiology*. Northern Illinois University, Dekalb, June 1998 to February 2000.

Textbook consultant in Physiology

C.V. Mosby Publications. (1984 - present)

- Seeley, Tate & Stevens, 1988. *Anatomy and Physiology*

- Schauf, Moffatt and Moffatt, 1989. *Human Physiology*

- Templin, 1988. *Anatomy Physiology Laboratory Manual*

- Gottfried, 1992. *Biology Today*

- Gottfried, 1993. *Elements of Anatomy and Physiology*

W.H. Freeman and Company. (1992-present)

- Anholt, 1993. *Dazzle 'em with Style*

- Delcomyn, 1994. *Fundamentals of Neurobiology*

- Randall, Burggren and French 2002-03. *Eckert: Animal Physiology*.

Oxford University Press (1994-present)

- Friesen & Friesen 1994. *Neurodynamix*

Yale University Press (1995-present)

Prentice-Hall Publication (1996-present)

-High School Textbook *Biology: Understanding Life*

-Middle School Biology & Health

Gulf Publishing Company (1999-present)

- Marine Ecology Textbooks: Brunnenmeister *Beachcombers Guide to the Gulf of Mexico*

Benjamin-Cummings (2000 - present)

Germann and Stanfield (2002; 2005). *Principles of Human Physiology*

McGraw-Hill (2002-present)

Vander, Sherman and Lucian (2003). *Physiology*, 9<sup>th</sup> ed

Top Hat Publishing, Toronto (2017 to present)

Chapter 16 – the Endocrine System. The eClassroom, ([www.tophat.com](http://www.tophat.com))

Judge Graduate Research, Baylor College of Medicine Biomedical Symposium, 14 March 2000.

Visiting Lecturer in Physiology, University of Texas Medical School-Houston. Fall 1999 - Fall 2000.

Graduate Faculty, College of Natural Sciences, University of Northern Iowa. Fall 1992 -1999.

Faculty Advisor, University North Iowa Beta-Beta-Beta Biological Honor Society. Fall 1993.

Faculty Advisor, University of Northern Iowa Triathlon Club, Spring 1993-1999.

Research Advisor, Board of Directors, St. Louis Aqua-Center, September 1988 - August 1992.

Educational Advisor, Gifted Resource Council of St. Louis, Board of Directors. April 1986 - August 1990.

Graduate Faculty, College of Arts and Sciences, University of Missouri, October 1985 - August 1992.  
Radiation Safety Certification - Medical College of Ohio, April 1982.

#### **IV. AWARDS, GRANTS AND SCHOLARSHIPS**

2017 11th Annual NSF Summer Neuro Workshop “*Hardware and Software Experiments to teach Neuroscience,*” at University of Missouri-Columbia, from 10-14 July.

2014-2015 James F. Lubker Faculty Research Award. September 2014.

2013 Regents Award for Faculty Excellence. September 2013.

2012 EPSCOR Funding. Support for screening of Microsatellite DNA from two species of *Uca* for NSF proposal. Jun & Sep.

2012 Carver Charitable Trust. Modernization of Teaching Laboratories for Students Pursuing Health Professions. PI David Saunders, Ph.D. Department Head and Chair, Co-PI for physiology labs.

2011 Iowa Recycle Reuse Technology Transfer Center. John Deer Fund. Field work in the northern Gulf of Mexico (June 11 to July 9).

2011 Office of Sponsored Program, UNI. Internal Seed Grant. Impact of an Oil Spill on Diversity in Keystone Coastal Species from the Gulf of Mexico. Feb 1, 2011 to May 31, 2012.

2010 Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), CNPJ/MF 33.654.831/0001-36, (Apr-Aug).

2009-10 Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP-Research Support Foundation State of Sao Paulo, Brasil) Grant # 2009/50799-0, July 2009-February 2010.

2009 University of Iowa, Center for Global and Regional Environmental Research, July 2009- June 2010.

2009 UNI- Graduate College. Professional Development Assignment (Sep to Dec).

2009 Fulbright Fellowship to Brazil, U.S. State Department, Committee on International Exchange of Scholars, Mar 2008.

2006-2007 UNI Distinguished Scholar Award, April 19, 2007.

2007 UNI- Summer Research Fellowship, July.

2007 UNI- RRTTC. Funding for Research on Caribbean *Uca*. March.

2006 Dean's Award: Superior Achievement in Research, College of Natural Sciences, Oct 23.

2006 UNI-CNS. Funding for NSF Chautauqua Course: Marine Ecosystems of Belize, Jan 2-7.

2005 University of South Carolina Visiting Scientist Award, Bell Baruch Marine Lab (June 1 to July 1).

2005 UNI- Summer Research Fellowship. Salt and Water Balance in Caribbean Fiddler Crabs. (May-Aug).

2004 UNI - CNS Funding. Sigma Xi Grantsmanship Workshop, UNI (Oct 20-23).

2004 UNI - RRTTC. Travel Opportunity for Faculty. Collections in Jamaica (Dec).

2003 UNI - RRTTC. Travel Opportunity for Faculty. Collections in south Florida (June).

2003 UNI- Summer Research Fellowship. Osmoregulation by fiddler crabs from subtropical Florida. (May-Aug).

2003-04 UNI- Graduate College. Professional Development Assignment (Aug 2003 to Aug 2004).

2002-04 Merck-AAAS Interdisciplinary Undergraduate Science Research Program (Jun 2002 – Aug 2004).

2001 UNI- Graduate College Project Grant. Collection of *Uca* in Georgia and Florida (Mar).

2001 UNI- Summer Research Fellowship. Expression Cloning of Ca<sup>++</sup> channel proteins in frog oocytes. (May-Aug).

2000 Amer. Physiological Soc. Fellowship for Teaching Physiology Workshop, Rush Med. School, Chicago, IL (Sep 15-17).

1999-2000 CNS - Applied Technologies Grant (July 1999-August 2000).

1999 UNI-Summer Research Fellowship. Expression Cloning of Ca<sup>++</sup> channel proteins in frog oocytes (May-Aug).

1999-2000 UNI - Professional Development Leave (Aug1999 to Aug 2000).

1998 UNI - MEG Computer Award (Oct).

1998 Burroughs-Wellcome Foundation/Federation of American Societies for Experimental Biology - Wellcome Visiting Professorship Award (Oct).

1997 National Science Foundation - Improvement of Laboratory Instrumentation (Jun).

1997 UNI - Minigrant. Development of a WWW home page for Health Sciences (May).

1997 UNI- Summer Research Fellowship. Study of Locomotor Rhythms in the Fiddler Crab *Uca subcylindrica* (Jun-Aug).

1995 UNI - Minigrant. The Use of Multimedia to Improve Teaching in Physiology (May).

1995 UNI- Summer Research Fellowship. Isolation and reconstitution of Na<sup>+</sup> channels from porcine kidney (Jun-Aug).

1995 UNI - Minigrant. Development of Undergraduate Research Training Grant proposal for 1996 (May).

1994 UNI - Graduate Faculty Research Grant. Purchase of isotopic sodium for flux analysis membrane microsomes (Jul).

1993 UNI - Graduate Faculty Research Grant. Purchase of DMA - adapter for PCLAMP electrophysiological data analysis system (Oct).

1993 UNI - Student Use Fees. Software and IBM power station for physiology program. (Jun).

1993 UNI - Minigrant. Adaptation of neurobiological software for classroom use (Neurodynamix) (Jun).

1993 UNI - Faculty Microcomputer Equipment Grant. Computer system for analysis of electrophysiological data (Apr-Jun).

1990-91 National Institutes of Health Senior Postdoctoral Fellowship. Study Na<sup>+</sup> channels from digestive tissue by reconstitution and patch clamping techniques (Sep1990 - Aug 1991).

1986 University of Missouri Grants Incentive for Improved Research Quality. For purchase of computer-controlled voltage clamp to study potassium permeability of basolateral membrane in toad urinary bladder.

- 1986 Sigma-Xi Research Society of North America. Financial support for studying effects of the polyene ionophore nystatin on ion transport in the toad urinary bladder.
- 1986 Sud-Americana Importadora Ltd. Financial support for studying effects of tropical plant extract on ion transport in toad urinary bladder.
- 1980 & 1983 National Kidney Foundation of Northwest Ohio Grant. For studies of aldosterone activity in *Necturus* urinary epithelium.
- 1980,1982, 1983 National Institute of Health Biomedical Research Support Grant. For development of animal facilities to accommodate aquatic amphibians.
- 1979 National Institute of Health Postdoctoral Research Training Grant. Department of Medicine, Nephrology Section, The Medical College of Ohio, Toledo.
- 1978 University of Minnesota Graduate School Thesis Assistance Grant.  
For development of statistical and computer data analysis (March).
- 1977 Sigma Xi Research Society of North America. For field studies in south Texas (Apr).
- 1976 University of Minnesota NSF Thesis Assistance Grant. Laboratory and equipment expenses (Nov).
- 1976-77 Dayton Natural History Fund. University of Minnesota Bell Museum of Natural History:  
a) Studies in south Texas and northern Mexico (January - Mar 1976, Apr 1977).  
b) Studies on the Yucatan Peninsula and Caribbean coast of Mexico. (Aug - Sep 1976).
- 1973 Thesis Assistance Grant. University of West Florida. For field equipment and laboratory studies (Mar).
- 1969-1970 National Science Foundation Predoctoral Summer Training Grants:  
a) Gulf Coast Research Laboratory: Ocean Springs, MS (1969)  
b) The Marine Biological Laboratory: Woods Hole, MA (1970)

## V. PUBLICATIONS

### A. Peer-Reviewed Articles.

1. Thurman, C.L., J.C. McNamera, H.-T Shih, M. Capparelli. 2024. Fiddler crabs from coastal Ecuador and the Galapagos Islands: Species descriptions and DNA barcodes. Manuscript.
2. Capparelli, M.V., R. Dzul-Caamal, E.M. Rodriguez, M.M. Borges-Ramirez, J. Rendon-von Osten, K. Beltan, B. Pichardo, A. Ramires, A. Vargus, C.L. Thurman, C. Rosa. 2024. Synergistic effects of microplastic and lead triggers physiological-biochemical impairment in a mangrove crabs. *Comparative Physiology and Biochemistry*, Pt C. 276:109809.
3. Thurman, C.L., H.-T. Shih, and J.C. McNamara. 2023. *Minuca panema* (Coelho, 1972): Resurrection of a fiddler crab species from Brazil related to *Minuca burgersi* (Holthuis, 1967). *Zoological Studies* 62:45. doi:10.6620/ZS.2023.62-45
4. Capparelli, M.V., J.C. McNamara, C.L. Thurman, R. Pérez-Ceballos, M.A. Gómez-Ponce, J.-G. Cardoso-Mohedanoa, and G.M. Moulatlet. 2022. Can tolerances of fiddler crabs to multiple stressors and calculated safety margins predict responses to extreme environmental conditions in resulting from climate change. *Marine Pollution Bulletin* 179:113674 (doi.org/10.1016/j.marpolbul.202.113674).

5. Thurman C.L., R.E. Alber, M.J. Hopkins, and H.-T Shih. 2021. Morphological and genetic variation among populations of the fiddler crab *Minuca burgersi* (Holthuis, 1967)(Crustacea: Brachyura: Ocypodidae) from shores of the Caribbean Basin and the western South Atlantic Ocean. *Zoological Studies* 60:19-46.
6. Capparelli, M.V. , C. L. Thurman , P. Gusso-Choueric, D.M. Abessac, M.K. Fontesc , C.R Nobrec , and J.C. McNamara. 2021. Survival on a semi-arid island: submersion and desiccation tolerances of fiddler crabs from the Galapagos Archipelago. *Marine Biology* 168:8 doi.org/10.1997/s00227-020-03807-6.
7. Conrad, I., A. Craft, C.L. Thurman, J.A. Baeza. 2020. The complete mitochondrial genome of the red-jointed brackish-water fiddler crab *Minuca minax* (LeConte 1855)(Brachyura: Ocypodidae): New family gene order, and purifying selection and phylogenetic informativeness of protein coding genes. *Genomics* 113: 565-572. <https://doi.org/10.1016/j.ygeno.2020.09.050>.
8. Thurman C.L., M.J. Hopkins, A.L. Brase and H.-T. Shih. 2018. The unusual case of *Minuca rapax* (Smith 1870): An exemplary polytypic species. *Invertebrate Systematics* 32: 1465-1490.
9. Thurman C.L., S.C. Faria, and J.C. McNamara. 2017. Geographical variation in osmoregulatory abilities among populations of ten species of fiddler crabs along the Atlantic coast of Brazil: A macrophysiological analysis. *J. Exp. Mar. Biol. Ecol.* 467: 243-253.
10. Faria, S.C., C.L. Thurman, and J.C. McNamara. 2017. Phylogenetic patterns and the adaptive evolution of osmoregulation in fiddler crabs (Brachyura, *Uca*). *PLoS One* 12(2): e0171870. doi:10.1371/journal.pone.0171870.
11. Hopkins, M.J. A. Haber, and C.L. Thurman. 2016. Constraints on geographic variation in fiddler crabs (Ocypodidae *Uca*) from the western Atlantic. *J. Evolutionary Biology* 29:1553-1568.
12. Hampton, K.R., M.J. Hopkins, J.C.McNamara, and C.L. Thurman. 2014. Intra- and interspecific variation in the carapace morphology of ten species of Brazilian fiddler crabs. *Aquatic Biology* 20: 53-67.
13. Wieman, A.C., P.B. Berendzen, K.R. Hampton, J. Jang, M.J. Hopkins, J. Jurgenson, J.C. McNamara and C.L. Thurman. 2013 Panmictic fiddler crabs along the coast of Brazil? Investigating the effects of divergent ocean currents and planktonic larvae on the genetic and morphological variation in *Uca maracoani*. *Marine Biology* 161: 173-185.
14. Thurman, CL. S. C. Faria, and J.C. McNamara. 2013. The distribution of fiddler crabs along the south Atlantic coast of Brazil: Implications for the biogeography of the western Atlantic Ocean. *Marine Biodiversity Records* 6:1-21.
15. Thurman, C. L., J. M. Hanna, and C.R. Bennett 2010. Ecophenotypic physiology: Osmoregulation by fiddler crabs (genus *Uca*) from the northern Caribbean in relation to ecological distribution. *Mar. Freshwater Physiol. and Behav.* 43: 339-356.
16. Hopkins, M.J. and C.L. Thurman 2010. The geographic structure of morphological variation in eight species of fiddler crabs from the eastern United States and Mexico. *Biol. J. Linnean Soc.* 100: 248-270.
17. Beougher, N.G., J. McIntosh, J.A. Djuren, M.W. Roth, C. Wexler and C. Thurman. 2006. Using molecular dynamics to model the DC electrical behavior of confined layers. *Amer. J. Undergrad. Res.* 5: 1-8.

18. Thurman, C.L. 2005. Osmoregulation by *Uca* from southern California and subtropical Florida. *Bull. Mar. Sci.* 77(1): 83-100.
19. Thurman, C.L. 2004. Unraveling the ecological significance of endogenous rhythms in intertidal crabs. *Biol. Rhythms Res.* 35:43-67.
20. Thurman, C.L. 2003. Osmoregulation by six species of fiddler crabs (*Uca*) from the Mississippi delta area in the northern Gulf of Mexico. *J. Experimental Marine Biology and Ecology* 291: 233-253.
21. Thurman, C.L. 2003. Osmoregulation in fiddler crabs (*Uca*) from temperate Atlantic and Gulf of Mexico coasts of North America. *Marine Biology* 142: 77-92.
22. Thurman, C.L. 2002. Osmoregulation in sympatric fiddler crabs (genus *Uca*) from northwestern Gulf of Mexico. *Marine Ecology (PSZN)* 23 (4): 269-284.
23. Thurman, C.L. and A.M. Broghammer. 2001. Locomotor activity of the fiddler crab, *Uca subcylindrica*, under artificial illumination. *Biol. Rhythms Res.* 32:73-87.
24. Thurman, C.L., J.S. Burns, and R.G. O'Neil. 2000. Identifying the Ca<sup>++</sup> signalling sources activating chloride currents in *Xenopus* oocytes using ionomycin and thapsigargin. *Cell. Signalling* 12: 629-635.
25. Kolkhorst, F.W., C.L. Broshears, M.K. Hoeger, and C.L. Thurman 1999. Effect of a sports bar on lipolysis and fat oxidation during prolonged exercise. *Sports Med. Training Rehab.* 9: 71-78.
26. Thurman, C.L. 1998. Locomotor rhythms in the fiddler crab *Uca subcylindrica*. *Biol. Rhythms Res.* 29: 179-196.
27. Thurman, C.L. 1998. Evaporative water loss, corporal temperature and the distribution of sympatric fiddler crabs (*Uca*) from south Texas. *Comp. Biochem. Physiol.* 119A: 279-286.
28. Thurman, C.L. 1995. Resting membrane potentials: a student test of alternate hypotheses. *Amer. Journal Physiol.* 269: s37-s41.
29. Thurman, C.L. 1990. Adaptive color change in Texas fiddler crabs. Texas A & M University Press (SG-90-106) pp. 109-125.
30. Thurman, C.L. and J.T. Higgins, Jr. 1990. Norepinephrine stimulation of sodium transport in *Necturus* urinary bladder epithelium. *Biochem. Biophys. Acta.* 1022:79-86.
31. Reinach, P.S., C.L. Thurman, H.E.P. Bazan, and N.G. Bazan. 1989. Reversal of the epinephrine stimulation of Cl<sup>-</sup> transport in bullfrog cornea by phorbol esters. *Exptl. Eye Res.* 49:739-749.
32. Thurman, C.L. 1988. A review: rhythmic physiological color change in Crustacea. *Comp. Biochem. Physiol.* 91C:171-186.
33. Thurman, C.L. and J.T. Higgins, Jr. 1988. Stimulation of sodium transport by catecholamines in the toad urinary bladder. *Biochem. Biophys. Acta.* 945:81-91.
34. Reinach, P.S., C.L. Thurman, and G. Klemperer. 1987. Basolateral membrane K permselectivity and regulation in bullfrog cornea epithelium. *J. Membrane Biology* 99:205-213.
35. Thurman, C.L. 1987. Fiddler crabs of eastern Mexico. *Crustaceana* (Leiden) 53:94-105.

36. Thurman, C.L. 1985. Reproductive biology and population structure of the fiddler crab *Uca subcylindrica* (Stimpson). *Biol. Bull.* 169:215-229.
37. Thurman, C.L. 1984. Ecological notes on the fiddler crabs of south Texas with special reference to *Uca subcylindrica*. *J. Crustacean Biology* 4:665-681.
38. Barnwell, F. and C.L. Thurman. 1984. Taxonomy and biogeography of fiddler crabs from the Atlantic and Gulf Coast plains of North America. *Zool. J. Linnean Soc.* 81:23-87.
39. Thurman, C.L. and J.T. Higgins, Jr. 1982. Amiloride stimulation of sodium transport in the presence of calcium and divalent cation chelator. *Biochimica et Biophysica Acta* 689:561-566.
40. Thurman, C.L. 1982. On the distinctness of the fiddler crabs *Uca minax* and *Uca longisignalis* in their region of sympatry. *Crustaceana* (Leiden) 43:37-50.
41. Thurman, C.L. 1981. *Uca marguerita*, a new species of fiddler crab (Brachyura: Ocypodidae) from eastern Mexico. *Proc. Biol. Soc. Wash.* 94:169-180.

## B. Invited Publications:

1. Thurman, C.L. 2016a. Review. The Natural History of Crustaceans: Vol 3: Nervous system & Control of Behavior. *Q. Review Biology* 91: 218.
2. Thurman, C.L. 2016b. Review. The Natural history of Crustaceans: Vol 4: Physiology. *Q. Review Biol.* 91: 369-370.
3. Biopac Systems, Inc. 2014. Higher Education BSL Pro Lessons, Goleta, CA.
  - a. Lesson A02: Contractility of Skeletal Muscle Using Frog Gastrocnemius Muscle.
  - b. Lesson A03: Compound Action Potential: Nerve Conduction.
  - c. Lesson A04: Effects of Drugs on the Frog Heart.
  - d. Lesson A15: Earthworm Smooth Muscle.
  - e. Lesson A17: Frog Heart: Intracellular Action Potentials.
4. Thurman, C.L. 2005. Laboratory Manual for Physiology: A Benjamin Cummings Custom Edition. D.M. Silverthorn, B.M. Johnson, and A. M. Miller (eds), San Francisco, CA.
  - a. Ch. 79. Active Transport by Frog Skin, p 801-810.
  - b. Ch. 80. Background Color Preferences and "Handedness" in Fish, p 811-820.
  - c. Ch. 81. The Chemical and Neural Basis of Control in Bioluminescence, p 821-831.
  - d. Ch. 82. The Hyperglycemic Hormone of the Crayfish, p 831-842.
  - e. Ch. 83. Introduction to Electronics and Instrumentation, p 843-852.
  - f. Ch. 84. Osmosis and Diffusion in the Red Blood Cell, p 853-866.
  - g. Ch. 85. Review of Electrical Terms and Principles of Instrumentation, p 867-882.
  - h. Ch. 86. The Vertebrate Kidney and Fluid/Electrolyte Balance, p 883-892.
5. Thurman, C.L. 1998. Neurobiology Laboratory Manual. Edvotek Biotechnology Education Co., West Bethesda, MD. pp 126.
6. Thurman, C.L. 1995. Student Learning Guide to Human Biology. C.V. Mosby, St. Louis. 127 pp.
7. Thurman, C.L. 1992. Chronobiology: Its role in Clinical Medicine, General Biology and Agriculture (Progress Biol. Res. Series Vol. 341A & B) *Amer. Zool.* 32: 606-607.



## C. Abstracts:

1. L. Villela, R.B. Bueno de Sousa, C. L. Thurman, J.C. McNamara, M.V. Capparelli. 2023. Osmoregulation in nine species of fiddler crabs (Brachyura, Ocypodidae) from the Eastern Pacific coast of Ecuador. 10th International Crustacean Conference, Symposium on Crustacean Evolutionary Physiology, Wellington New Zealand. 22-26 May. Abstract #45.
2. Pruisman, T., A. Finke, F.H. Barnwell, C.L.Thurman 2022. Curation of a global collection of grapsoid crabs for the American Museum of Natural History, NYC. UNI Summer Undergraduate Research Symposium. <https://scholarworks.uni.edu/surp/2022/all/7/> .
3. Finke, A., J. Demaster, A. Baeza, C.L. Thurman 2021. The mitochondrial genome of the spiny-wristed fiddler crab, *Leptuca spinicarpa* Rahbun 1900. UNI Summer Undergraduate Research Symposium. <https://scholarworks.uni.edu/surp/2021/all/3/> .
4. Kipp, C., C.L. Thurman, M.Hopkins 2021. Geometric Morphometric analysis of fiddler crab from the shore of the western Atlantic Ocean. UNI Summer Undergraduate Research Symposium. <https://scholarworks.uni.edu/surp/2021/all/4/> .
5. Pitzen, D. , S. Heyer, A. Finke, F.H. Barnwell, C.L. Thurman 2021. Curating a global collection of fiddler crabs for the American Museum of Natural History, NYC. UNI Summer Undergraduate Research Symposium. <https://scholarworks.uni.edu/surp/2021/all/10/> .
6. Capparelli, M., J. Molinero , J. McNamara, and C.L. Thurman 2019. Fiddler crabs distribution in Ecuador: using biodiversity as an indicator of ecosystem health. IBS 2019. Humboldt -250 Meeting: 2nd Latin American Congress on Biogeography. Quito, Ecuador. 8 Aug.
7. Thurman C.L. 2015. Macrophysiology – a global perspective of evolution in intertidal organisms. XIX Mar. Biol. Symp.USP-CEBIMar, São Sebastião, SP, Brazil. 25-27 Nov.
8. Armantrout, A. J.C. Bower, CL Thurman and R. R. Broaddus 2015. Actions of transforming growth factor- $\beta$  on endometrial cancer cell migration and invasion: Is CD73 the balance between tumor suppressor and pro-metastatic factor? UNI Summer Undergraduate Research Symposium, July 31.
9. Nogueira, G.G., D. McClenehan and C.L. Thurman. 2015. Effects of lipopolysaccharide and adenosine triphosphate on cultured bovine mammary gland transepithelial resistance and permeability. UNI Summer Undergraduate Research Symposium, July 31.
10. Schumacher, K., C.L. Thurman and R. Platenberg. 2015. Habitat salinity and substrate preference of fiddler crabs in St. Thomas, USVI. UNI Summer Undergraduate Research Symposium, July 31.
11. Dreyer, A., C. Thurman, P. Berendzen Who's your crawdaddy? 2015. Genetic identification of crayfish species of the Cedar River Basin. National Undergraduate Research Conference. April 16-18, Cheney Washington.
12. Stevens, H., P. Berendzen and C.L. Thurman. 2014. Do crayfish from the same location have identical patterns of daily activity? UNI Summer Undergraduate Research Symposium, August 1.

13. Dreyer, A., C. Thurman, P. Berendzen 2014 .Who's your crawdaddy? Genetic identification of crayfish species of the Cedar River Basin. UNI Summer Undergraduate Research Symposium. August 1.
14. Thomas, K, M.J. Hopkins, and C.L. Thurman. 2014. Latitude and environmental pressure: Their impact on carapace shape in three species of fiddler crabs from different regions of the Atlantic Ocean. National Undergraduate Research Conference. April 3-5, Lexington, Kentucky.
15. Faria, S.C., C.L. Thurman and J.C. McNamara. 2014. Variation in osmoregulatory ability among ten species of fiddler crabs from the Atlantic coast of Brazil. Soc. Compar. Integ. Biology Annual Meeting, Austin, TX. January 3-7.
16. Hancock, T., M. Jacobson, and C.L. Thurman. 2013. Phenotypic variation: Morphological differences among populations of the fiddler crab *Uca rapax* from the western Atlantic Ocean. UNI Summer Undergraduate Research Symposium, August 2.
17. Thomas, K, M.J. Hopkins, and C.L. Thurman. 2013. Latitude and environmental pressure: Their impact on carapace shape in three species of fiddler crabs from different regions of the Atlantic Ocean. UNI Summer Undergraduate Research Symposium, August 2.
18. Faria, S.C., C.L. Thurman and J.C. McNamara 2013. Phylophysiology, or the use of phylogenetic comparative methods in physiology: learning from decapod crustaceans. 17<sup>th</sup> Evolutionary Biology Meeting, 17-20 Sep, Marseilles, France.
19. Faria, S.C., C.L. Thurman, and J.C. McNamara. 2013. Crab osmoregulation and habitat diversification: Does salinity drive physiological evolution? XIV Congress of the European Society for Evolutionary Biology, 19-24 August, Lisbon, Portugal.
20. Faria, S.C., C.L. Thurman, and J. C. McNamara. 2012. Decapod osmoregulation and habitat diversification: does salinity drive physiological evolution? São Paulo School of Advanced Sciences – Evolution. Poster Session; Aug 19-31, Ilha Bella, São Sebastião, Brazil.  
<http://www.ib.usp.br/zoologia/evolution/posters.html>
21. Weimann, A.B., K.R. Hampton, J.J. Jang, P. Berendzen, C.L. Thurman and J.C. McNamara. 2012. Panmictic fiddler crabs along the coast of Brazil? Investigating the effect of divergent oceanic current and planktonic larvae on morphological and genetic variation in *Uca maracoani*. 1<sup>st</sup> Joint Congress on Evolutionary Biolgy. July 6-10, Ottawa, Ont. Canada, p119, # 225.
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23. Faria, S.C., C.L. Thurman and J.C. McNamara. 2011. Variation in osmoregulatory ability among ten species of fiddler crabs from the Atlantic coast of Brazil. Combined Meeting of the Iowa and Nebraska Physiological Societies. Des Moines University, Iowa. Oct 21-22.
24. Hampton, K.R., M. Hopkins, J.C. McNamara, and C.L. Thurman. 2011. Intra- and interspecific variation in ten species of Brazilian fiddler crabs. UNI Summer Undergraduate Research Symposium, July 29. [http://www.uni.edu/biology/res\\_ugrad\\_11.html](http://www.uni.edu/biology/res_ugrad_11.html)
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42. Mraz, J., C. Thurman, C. Bennett and R. Brodie. 2006. Salinity tolerance in megalopal and adult crabs of *U. minax*: Can early life stages withstand the same salinity regimes as adults? Integ. Comp. Biology 45: 1169.
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45. Trainer, J., C.L. Thurman and D. Wiens. 2004. Creating an intellectual community among undergraduate research students. Council on Undergraduate Research. La Crosse, WI, June 14-17.
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67. Thurman, C. and P. Reinach. 1986. Basolateral membrane characteristics of bullfrog corneal epithelia. Fed. Proc. 45:747.
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85. Thurman, C.L. 1973. The distribution of fiddler crabs, genus *Uca*, along the northwestern Gulf of Mexico. *Q.J. Florida Acad. Sci.* 36 (suppl.2):14.

## VI. Current Faculty Activities - SERVICE AND VOLUNTEER

### A. Teaching:

Life Continuity and Change – Fall 2023

Human Anatomy I& II - Fall 1983 through Spring 1992.

Fall 2001, 2002, 2004, 2005, 2007, 2011, 2012, 2020 2022, 2023. Spring 2002, 2005, 2008, 2009, 2010, 2011, 2012, 2013. 2014, 2015, 2016, 2017, 2018, 2020, 2021, 2022, 2023, 2024.

Human Physiology - Fall 1992, 1993, 1994, 1995, 1996, 1997, 1998, 2000, 2001, 2002. Spring 1998, 1999.

Vertebrate Physiology - Fall 2004, 2005, 2007, 2011, 2013, 2015, 2017, 2019, 2021

Topics in Molecular Biology - Fall 1992.

Comparative Animal Physiology - Spring 1993, 1994, 1995, 1996, 1997, 2001, 2002, 2003, 2005, 2010

Fall 2006, 2008, 2012, 2014, 2016, 2018, 2020, 2022

Neurobiology - Fall 1995, 1997, 2010, 2012. Spring 1994, 2001, 2008, 2009, 2011, 2012; 2010 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023.2024

Endocrinology - Fall 1994, 1996.  
Careers in Health Sciences - Spring 1996, 1998, 2002.  
Marine Ecology of the Western Gulf of Mexico - Spring 1999.  
Cell and Systems Physiology (UT-Houston Medical School) - Spring 2000.  
Biology of Florida's Islands and Coral Reefs - Spring 2003, 2006.  
New Capstone: Obesity and Diabetes - Fall 2005, Spring 2006  
Animal Histology/Cytology – Spring 2006, Fall 2008. Spring 2014, 2016

B. Proposed Courses:

Laboratory in Molecular/Cellular Physiology (NSF-funded).

C. Departmental Social Functions:

UNI Biology Spring Banquet - 1993, 1994, 1995, 1996, 1997, 1998, 1999.  
Annual Fall Picnic - 1994, 1995, 1996.

D. Extramural Summer Undergraduate Research Students:

1993 - April Smith, Tracey Brightman, Matt Maloney.  
1994 - Lori Bries, Jody Bolton, Jill Jasper, Julie Stone, Rene Kragebrink.  
1995 - Mike Staloch, Joe Witham, Stacey Sumstine, Amy Vanous, Ben Reinking.  
1996 - Emily Ballou, Anna Marie Borts, Mike Maddox, Annette Shannon.  
1997 - Janelle Chaney, Melissa Irlmeier, Carli Richtsmeier, Elizabeth Williams, Craig Olson.  
1998 - Holly Bagnall, Osama Elsayy, Margarite Gruber, Deborah Hanson, Shilpa Patel.  
1999 - Kyle Alliman, Jon Burns, Julie Felderman, Mike Shimkus, Rob Shontz, Julie Steenhoek.  
2000- Rhonda Maassen, Erin McNaughten, Kate Thomsen, Regan Kaiser.  
2001- Amanda Dohrman, Carrie Karvonen, Michelle Montgomery, Melissa Muff, Lance Rouse,  
Kenneth Steffen, Ben Schlicher, Audey Veach.  
2002 - Molly Decker, Connie Dettman, Melissa Jeddloch, Danielle Miller. Audey Veach.  
2003 - Jessica Ball, Libby Long.  
2015 – Ashley Armantrout, Kelsey Schumacher

E. UNI - Biology Summer Research Students

1993 - Jody Bolton, Lori Bries.  
1994 - Mike Staloch, Peter Stavlund.  
1996 - Ryan Holthuis, Anne Broghammer.  
1997 - Libby Balbort, James Saunders.  
1998 - Nicholas Goetsch, Karen Wooten.  
2001 - Tanya Poshusta.  
2003 - Alison McFadden.  
2004 - Joslin Bowen (Dept. Comp. & Integ. Physiol., UNMC-Omaha)  
2005 - Jennifer Mraz, Raven Bier (Belle Baruch Marine and Field Station, South Carolina)  
2006 - Lezlie Anderson and Alexa Warwick.  
2007 - Michelle Gleason and Alexa Warwick  
2008 - Michelle Gleason and Alexa Warwick  
2011 – Kelsey Hampton, Morgan Rilling and Janelle Woodin  
2013 – Katherine Thompson, Tasha Hancock (McNair Scholar)  
2014 – Allison Dreyer, Haley Stevens.  
2021 – Amber Finke, Claire Kipp  
2022- Taylor Pruisman, Amber Finke, Claire Kipp

F. University Honor's Program

2011 – Amanda Brase  
2013 – Katherine Thompson  
2016 – Ashley Armantrout  
2018 - Reid Albers  
2021 - Amber Finke, Claire Kipp  
2022 - Amber Finke, Claire Kipp

2023 - Amber Finke, Claire Kipp  
2024 – Amber Finke, Claire Kipp

G. Merck-AAAS Interdisciplinary Research Students (2002-2004)

2002- Elizabeth Barrett, Josh Carlson, Robert Drewelow, Matt Hoffert, Justin Meeks, Steve Olson.  
2003- Jacob Becker, Sherrie Elzey, Jeff Fisher, Michelle Healy, Jason McIntosh.  
2004- Andrea Callaghan, Colleen Chisman, Forest Isbell, Adam Perkin, Manuela Rodriguez

H. Research Avenues for Science Teachers, College of Natural Sciences, UNI (2006 – 2008)

2006 - Christine Winstead, Waterloo West High School  
2007- Joshua Hanna, Davenport High School

I. Faculty Committees/Programs

1993-02 Coordinator Biology Summer Undergraduate Research Program.  
1995-97 Search Committee - Immunology/Biotechnology, Physiologist.  
1996-97 Outcome Assessment.  
1996-97 Alternate Representative to Faculty Senate.  
1997-98 Search Committee - Cell Biologist/Physiologist.  
1998-99 Biology Professional Assessment Subcommittee.  
1999-2000 Professional Development Assignment, University of Texas – Houston.  
2000-01 Physiologist Search Committee.  
HPELS Clinical Specialist Search Committee  
Sigma Xi Speakers Committee - Mar 20,21, 2001- Ferid Murad, UT-Houston.  
2001-02 Presidential Scholar Thesis Advisor (Amanda Dohrman, L. Rouse)  
Sigma Xi Speaker (Sep 2002), Stanley Schultz, MD, UT-Houston.  
Search Committee- Chemistry Department, Biochemist position  
Art and Architecture Committee.  
2002-03 Biology Department New Equipment Committee  
CNS / Merck-AAAS Interdisciplinary Summer Research Program  
Search Committee - Chemistry Department, Biochemist position  
Art and Architecture Committee.  
McKay Research Award Committee, UNI Graduate College.  
Presidential Scholar Thesis Advisor (Molly Decker).  
2003-04 Univ. Nebraska Medical Center- Omaha, IACUC certification.  
2004-05 Pre-optometry Club Advisor, Science , Mathematic & Technology Scholarship  
Committee, Graduate Council Alternate (for James Jurgenson), CNS Undergraduate  
Research Poster Session (July 31).  
2005-06 Pre-optometry Club Advisor. Mathematic & Technology Scholarship Committee,  
Outcomes Assessment , Graduate Council Alternate (for James Jurgenson), CNS  
Undergraduate Research Poster Session (Aug 1).  
2006-07 Pre-optometry Club Advisor, Outcomes Assessment, Math and Science Scholarships,  
CNS Undergraduate Research Poster Session (Aug 3).  
2007-08 Pre-optometry Club Advisor, Outcomes Assessment, Dean's Advancement Committee,  
CNS Undergraduate Research Poster Session (July 31).  
2008-09 Pre-optometry Club Advisor, Outcomes Assessment, Dean's Advancement Committee,  
Biology Scholarship Committee, CNS Undergraduate Research Poster Session (July 31)  
2009-10 Publicity Committee, Biology Scholarships, Outcomes Assessment, Summer  
Undergraduate Research Program.  
2010-11 Publicity Committee, Biology Scholarships, Outcomes Assessment , Summer  
Undergraduate Research Program, alternative for PAC, pre-Pharmacy Faculty advisor  
2011-12 College/Department Advancement, Biology Scholarships, Outcomes Assessment ,  
Summer Undergraduate Research Program, pre-Pharmacy Faculty advisor.  
2012-13 College/Department Advancement, Biology Scholarships, Outcomes Assessment,  
Summer Undergraduate Research Program, pre-Pharmacy Faculty advisor.  
2013-14 College/Department Advancement, Biology Scholarships, Outcomes Assessment,



Summer Undergraduate Research Program, pre-Pharmacy Faculty advisor.  
2014-15 College/Department Advancement, Biology Scholarships, Outcomes Assessment,  
Summer Undergraduate Research Program, pre-Pharmacy Faculty advisor.  
2015-16 College/Department Advancement, Biology Scholarships, Outcomes Assessment,  
Summer Undergraduate Research Program, pre-Pharmacy Faculty advisor.  
2016-17 College/Department Advancement, Biology Scholarships, pre-Pharmacy Faculty advisor.  
Chair Biology Tenure–Promotion (PAC) Committee.  
2017-18 Biology Scholarships, Outcomes Assessment, pre-Pharmacy Faculty advisor,  
Chair Biology Tenure–Promotion (PAC) Committee.  
2018-19 Biology Scholarships, Outcomes Assessment, pre-Pharmacy Faculty advisor  
Chair Biology Tenure–Promotion (PAC) Committee.  
2019-20 James F. Lubker Faculty Research Award Selection Committee, Biology Scholarships,  
Outcomes Assessment, pre-Pharmacy Faculty advisor. Chair Biology Tenure–Promotion  
(PAC) Committee.  
2020-21 Biology Scholarships, pre-Pharmacy Faculty advisor.  
2021-22 Biology Scholarships, pre-Pharmacy Faculty advisor.  
2022-23 Biology Scholarships, pre-Pharmacy Faculty advisor.  
2023-24 Biology Scholarships, pre-Pharmacy Faculty advisor