TURK ELEAZAR RHEN

CURRICULUM VITAE

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PERSONAL DATA
Date of Birth: 15 June, 1968
Place of Birth: Grand Forks, North Dakota
Spouse: Esperanza Isabel Rhen
Children: Patrick, Lovisa, Dane, and Nobel
Languages: English, also fluent in Spanish

EDUCATION
University of Texas-Austin, Ph.D. in Zoology, May 2000.
University of North Dakota, M.S. in Biology, December 1993.
University of Minnesota Biological Station-Lake Itasca, Summer 1991.
University of North Dakota, B.S. in Biology, minor in Chemistry, May 1991.

PROFESSIONAL EXPERIENCE
Assistant Professor, Department of Biology (UND), August 2003 to present.
Postdoctoral Fellow, Supervisor: John Cidlowski (NIH), July 2000 to July 2003.
GRA, Supervisor: David Crews (UT-Austin), Fall 1999 and Spring 2000.
GTA, Mammalian Anatomy (UT-Austin), Fall 1997.
GTA, Genetics (UT-Austin), Spring and Fall 1995 and Spring 1996.
GTA, Vertebrate Physiology (UT-Austin), Fall 1994.
GTA, Vertebrate Anatomy and Adaptations Laboratory (UND), Fall 1993.
GTA, Biometry (UND), Spring 1992 and 1993.
GTA, Animal Physiology Laboratory (UND), Fall 1992.
Undergraduate Research Assistant (UND), May 1990 to September 1991.
Tutor for Learning Services (UND), November 1989 to May 1990.

PROFESSIONAL SOCIETIES
The Endocrine Society
The Society for Integrative and Comparative Biology
The Society for the Study of Evolution

HONORS/FELLOWSHIPS/SCHOLARSHIPS
Faculty Research Proposal Writing Fellowship, (UND), Spring 2007.
National Research Service Award-Predoctoral Fellowship (National Institute of Mental Health), 1996-1999.
Travel Fellowship (Department of Zoology, UT-Austin), 1998.
Carl Gottfried Hartman Fellowship (Department of Zoology, UT-Austin), 1998

David Bruton, Jr. Fellowship (UT-Austin), 1998-1999.
Sigma Xi, elected full member 1997.
Zoology Scholarship Endowment for Excellence (UT-Austin), 1997.
Houston Endowment President's Excellence Fellowship (UT-Austin), 1996-1997.
Summer Tuition Fellowship (UT-Austin), 1996.
State Board of Higher Education Scholarship (UND), 1993.

GRANTS/AWARDS

Loan Repayment Program for Contraception and Infertility Researchers, NIH (National Institute of Child Health and Human Development), 2006-2008.

Exploratory/Developmental Research Grant (R21), NIH (National Institute of Child Health and Human Development), 2005-2008.

Faculty Travel Award, Senate Scholarly Activities Committee (UND), 2005.

Fellows Award for Research Excellence (National Institute of Environmental Health Sciences), 2002.

Dissertation Improvement Grant (National Science Foundation), 1996-1999.

Student Activities Committee Travel Stipend (UND), 1993.

Biology Graduate Student Association Travel Stipend (UND), 1993.

Academic Programs and Student Awards Committee Research Stipend (UND), 1992.

Floyd Hunter Memorial Award (UND), 1991.

BOOK CHAPTERS

Rhen, T., and D. Crews. 2001. Sex and gender. Pp.154-164 *In* C.W. Fox, D.A. Roff, and D.J. Fairbairn eds., *Evolutionary Ecology: Concepts and Case Studies.* Oxford University Press, Oxford.

Rhen, T., and J.A. Cidlowski. 2004. Steroid hormone action. Pp. 155-174 *In* J.F. Strauss and R. Barbieri, eds., *Yen and Jaffe's Reproductive Endocrinology, 5th Edition*. W.B. Saunders, Orlando.

Rhen, T., and J.A. Cidlowski. 2004. Nuclear factor-kappa B and glucocorticoid receptors. Pp. 391-398 *In* L. Martini, ed., *Encyclopedia Endocrine Diseases*. Elsevier Science Inc., New York.

Rhen, T., and J.W. Lang. 2004. Phenotypic effects of incubation temperature. Pp. 90-98 *In* N. Valenzuela and V. Lance, eds., *Temperature-Dependent Sex Determination*. Smithsonian Institution Press, Washington D.C.

Rhen, T., and D. Crews. 2007. Why are there two sexes? In Becker, J.B., K. Berkley, N. Geary, E. Hampson, J. Herman, and E. Young, eds., *Sex on the Brain: From Genes to Behavior*. Oxford University Press, Oxford (*in press*).

Rhen, T. 2007. Sex differences: genetic, physiological, and ecological mechanisms. Pp. 167-175 In D.J. Fairbairn, W.U. Blanckenhorn, and T. Szekely, eds., *Sex, Size, and Gender Roles: Evolutionary Studies of Sexual Size Dimorphism*. Oxford University Press, Oxford.

PUBLICATIONS

1. Rhen, T. and J.W. Lang. 1994. Temperature-dependent sex determination in the snapping turtle: manipulation of the embryonic sex steroid environment. General and Comparative Endocrinology 96: 243-254.
2. Crews, D., A. Cantu, J. Bergeron, and T. Rhen. 1995. The relative effectiveness of androstenedione, testosterone and estrone, precursors to estradiol, in sex reversal in the red-eared slider (*Trachemys scripta*), a turtle with temperature-dependent sex determination.

General and Comparative Endocrinology 100: 119-127.
3. Rhen, T. and J.W. Lang. 1995. Phenotypic plasticity in the common snapping turtle: effects of incubation temperature, clutch, and their interaction. American Naturalist 146: 726-747.
4. Rhen, T., P.K. Elf, A.J. Fivizzani, and J.W. Lang. 1996. Sex-reversed and normal turtles display similar sex steroid profiles. Journal of Experimental Zoology 274: 221-226.
5. Crews, D., A.R. Cantu, T. Rhen, and R. Vohra. 1996. The relative effectiveness of estrone, estradiol 17-β, and estriol in sex reversal in the red-eared slider (*Trachemys scripta*), a turtle with temperature-dependent sex determination. General and Comparative Endocrinology 102: 317-326.
6. Rhen, T. and J.W. Lang. 1998. Among-family variation for environmental sex determination in reptiles. Evolution 52: 1514-1520.
7. Crews, D., J. Sakata, and T. Rhen. 1998. Developmental effects on intersexual and intrasexual variation in growth and reproduction in a lizard with temperature-dependent sex determination. Journal of Comparative Biochemistry and Physiology C 119: 229-241.
8. Rhen, T. and J.W. Lang. 1999. Embryonic and juvenile temperature independently influence growth in hatchling snapping turtles, *Chelydra serpentina***.** Journal of Thermal Biology 24: 33-41.
9. Bergeron, J.M., E. Willingham, C.T. Osborn III, T. Rhen, and D. Crews. 1999. Developmental synergism of steroidal estrogens in sex determination. Environmental Health Perspectives 107: 93-97.
10. Rhen, T. and J.W. Lang. 1999. Incubation temperature and sex affect mass and energy reserves of hatchling snapping turtles (*Chelydra serpentina*). Oikos 86: 311-319.
11. Rhen, T., and D. Crews. 1999. Embryonic temperature and gonadal sex organize male-typical sexual and aggressive behavior in a lizard with temperature-dependent sex determination. Endocrinology 140: 4501-4508.
12. Rhen, T., J. Ross, and D. Crews. 1999. Effects of testosterone on sexual behavior and morphology in adult female leopard geckos, *Eublepharis macularius.* Hormones and Behavior 36: 119-128.
13. Rhen, T., E. Willingham, J.T. Sakata, and D. Crews. 1999. Incubation temperature influences sex steroid levels in juvenile red-eared slider turtles, *Trachemys scripta*, a species with temperature-dependent sex determination. Biology of Reproduction 61: 1275-1280.
14. Rhen, T. 2000. Sex-limited mutations and the evolution of sexual dimorphism. Evolution 54: 37-43.
15. Willingham, E., T. Rhen, J.T. Sakata, and D. Crews. 2000. Embryonic treatment with xenobiotics disrupts steroid hormone profiles in hatchling red-eared slider turtles (*Trachemys scripta elegans*). Environmental Health Perspectives 108: 329-332.
16. Rhen, T., and D. Crews. 2000. Organization and activation of sexual and agonistic behavior in the leopard gecko, *Eublepharis macularius*. Neuroendocrinology 71: 252-261.
17. Rhen, T., J.T. Sakata, M. Zeller, and D. Crews. 2000. Sex steroid levels across the reproductive cycle of female leopard geckos, *Eublepharis macularius*, from different incubation temperatures. General and Comparative Endocrinology 118: 322-331.
18. Rhen, T., and D. Crews. 2001. Distribution of androgen and estrogen receptor mRNA in the brain and reproductive tissues of the leopard gecko, *Eublepharis macularius*. Journal of Comparative Neurology 437: 385-397.
19. Rhen, T., and D. Crews. 2002. Variation in reproductive behavior within a sex: neural systems and endocrine activation. Journal of Neuroendocrinology 14: 517-532.

20. Rhen, T., J.T. Sakata, R. Porter, S. Wooley, and D. Crews. 2003. Changes in androgen receptor mRNA expression in the forebrain and oviduct during the reproductive cycle of female leopard geckos, *Eublepharis macularius*. General and Comparative Endocrinology 132: 133-141.
21. Rhen, T., S. Grissom, C. Afshari, and J.A. Cidlowski. 2003. Dexamethasone blocks the biological effects of 17β-estradiol in the rat uterus without antagonizing its global genomic actions. FASEB Journal 17: 1849-1870.
22. Rhen, T., J.T. Sakata, and D. Crews. 2005. Effects of gonadal sex and incubation temperature on the ontogeny of gonadal steroid concentrations and secondary sex structures in leopard geckos, *Eublepharis macularius*. General and Comparative Endocrinology 142: 289-296.
23. Rhen, T., and J.A. Cidlowski. 2005. Anti-inflammatory action of glucocorticoids: new mechanisms for old drugs. New England Journal of Medicine 353: 1711-1723.
24. Rhen, T., and J.A. Cidlowski. 2006. Estrogens and glucocorticoids have opposing effects on the amount and latent activity of complement proteins in the rat uterus. Biology of Reproduction 74: 265-274.
25. Rhen, T., D. Crews, A.J. Fivizzani, and P.K. Elf. 2006. Reproductive tradeoffs and yolk steroids in female leopard geckos, *Eublepharis macularius*. Journal of Evolutionary Biology 19: 1819-1829.
26. Rhen, T., K. Metzger, A. Schroeder, and R. Woodward. 2007. Expression of putative sex-determining genes during the thermosensitive period of gonad development in the snapping turtle, *Chelydra serpentina*. Sexual Development 1: 255-270.

ABSTRACTS

Rhen, T., and D. Crews. 1996. Phenotypic plasticity in adult sex traits of lizards with temperature-dependent sex determination. American Zoologist 36: Abstract 492, 128A.

Lang, J.W., and T. Rhen. 1998. Sex ratio evolution in reptiles with temperature-dependent sex determination. Special Issue: Proceedings from the First International Symposium on the Biology of Vertebrate Sex Determination, April 7-11, 1997, Honolulu, Hawaii. Guest Editors: V.A. Lance and M.H. Bogart. Journal of Experimental Zoology 281: 509-510.

Sakata, J.T., T. Rhen, and D. Crews. 1998. Ontogeny of secondary sex structures and gonadal steroids in the leopard gecko. American Zoologist 38: Abstract 297, 86A.

Rhen, T., J.T. Sakata, and D. Crews. 1998. The reproductive cycle of female leopard geckos. American Zoologist 38: Abstract 302, 88A.

Rhen, T. 1999. Sex-limited mutations and the evolution of sexual dimorphism. Annual Meeting, Society for the Study of Evolution, Madison, Wisconsin.

Rhen, T., and D. Crews. 2000. Androgen receptor mRNA expression in the ventromedial hypothalamus and androgen-dependent sexual receptivity. Society for Neuroscience Abstracts.

Rhen, T., and J.A. Cidlowski. 2001. Glucocorticoids block estrogen-induced uterine growth. The Endocrine Society Abstracts.

Crews, D., T. Rhen, R.S. Porter, S.C. Wooley, and J.T. Sakata. 2001. Changes in sex steroid hormone receptor gene expression over the reproductive cycle in female leopard geckos. Society for Neuroscience Abstracts.

Rhen, T., and J.A. Cidlowski. 2002. The classical pathway of complement plays a role in mediating the pro-inflammatory effects of E2 in the rat uterus. The Endocrine Society Abstracts.

Rhen, T., and J.A. Cidlowski. 2003. Dexamethasone antagonizes estrogen action in immature rat

uterus without blocking estrogen induced gene expression. The Endocrine Society Abstracts.

Elf, P., T. Rhen, A. Fivizzani, and D. Crews. 2004. Relationships between female circulating plasma hormones and hormones deposited in eggs of the leopard gecko, *Eublepharis macularius.* Society for Integrative and Comparative Biology Abstracts.

Elf, P., T. Rhen, A. Fivizzani, and D. Crews. 2005. Inter- and intra-seasonal differences in yolk hormone levels in eggs from the leopard gecko, *Eublepharis macularius.* Society for Integrative and Comparative Biology Abstracts.

INVITED SEMINARS

Rhen, T. 1996. Possible Adaptive Significance of Temperature-Dependent Sex Determination. International Herpetological Society Symposium, San Antonio, Texas.

Rhen, T. 2004. Estrogen and glucocorticoid regulation of uterine gene expression, inflammation, and innate immunity. Department of Biochemistry and Molecular Biology, University of North Dakota School of Medicine and Health Sciences.

Rhen, T. 2004. The genetics, evolution, and ecology of sex differences. Anthropology Club, University of North Dakota.

Rhen, T. 2005. Evolution of sex differences: genetic, physiological, and ecological mechanisms. Conference on the Evolution of Sexual Size Dimorphism. Centro Stefano Franscini, Monte Verita, Switzerland.

Rhen, T. 2005. Comparative genomics of sex determination in vertebrates. Department of Biological Sciences, North Dakota State University.

Rhen, T. 2005. Comparative genomics of sex determination in amniotes. Department of Animal Sciences, Rutgers University.

EDITORIAL SERVICE

Editorial Board of Sexual Development, Karger, AG, Basel (2006-present).

AD HOC REVIEWER

American Naturalist; Biology of Reproduction; Biology Letters; Canadian Journal of Zoology; Copeia; Ecography; Ecology; Endocrinology; Evolution; Journal of Comparative Physiology B Biochemical, Systemic, and Environmental Physiology; Journal of Experimental Biology; Journal of Experimental Zoology; Journal of Herpetology; Journal of Steroid Biochemistry and Molecular Biology; Journal of the World Aquaculture Society; Naturwissenschaften; Oikos; Oncogene; Physiological and Biochemical Zoology; PLoS Medicine; Proceedings of the Royal Society Series B; Trends in Ecology and Evolution

GRANT REVIEWER

National Science Foundation (Program in Ecological and Evolutionary Physiology, Neuroendocrinology Program, and Dissertation Improvement Grants)

UNIVERSITY SERVICE

Academic Program and Student Awards Committee (2004-2007)
Radiation Safety Committee (2004-2007)

Animal Physiologist Search Committee (2005-2006)
Genomics Search Committee (2006-2007)
Molecular Biology Core Facilities Committee (2007)
Graduate Faculty of the University of North Dakota (Associate Member 2003-2006; Full Member 2006-present)

OTHER PROFESSIONAL WORK

Reviewed and rated high school biology textbooks for the Texas Education Agency.
Wrote chapter review questions and answers for fifth edition of *Endocrinology* by M.E. Hadley. Prentice-Hall, Upper Saddle River, New Jersey.
Served as a judge for Fellows Award for Research Excellence (National Institutes of Health, 2003).

REFERENCES

Dr. Jeffrey W. Lang (M.S. advisor)
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