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Department of Psychology
University of California at Davis
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Professional Positions

1996-1997 Research Assistant with Dr. Alexandra Basolo, University of Nebraska Lincoln
1999-2001 Research Assistant with Dr. Catherine Marler, University of Wisconsin Madison
2001-2003 Predoctoral Fellow with Dr. Catherine Marler, University of Wisconsin Madison
2003-2004 Postdoctoral Researcher with Dr. Hans Hofmann, Harvard University
2004-2006 Postdoctoral Researcher with Dr. Randy Nelson, Ohio State University
2006-2007 Postdoctoral Fellow with Dr. Randy Nelson, Ohio State University
2007-2011 Assistant Professor, Department of Psychology, University of California Davis
2011-present Associate Professor, Department of Psychology, University of California Davis

Affiliations

2007-present Member, Molecular, Cellular, and Integrative Physiology Graduate Group.
2008-present Member, Animal Behavior Graduate Group
2008-present Member, Human Development Graduate Group
2008-present Member, Neuroscience Graduate Group
2011-present Affiliate, UC Davis Center for Neuroscience

Education and Post-doctoral Training

University of Texas at Austin, B.S. Biology. 1992-1996
University of Nebraska at Lincoln. M.S. Biology. May 1996-1998
University of Wisconsin at Madison. Ph.D. Psychology. 1998-2003
Harvard University. Bauer Center for Genomics Research. Post-doctoral Researcher. 2003-2004
Ohio State University. Department of Psychology. Post-doctoral Fellow. 2004-2007

Publications

1. Trainor, B. C. & Basolo, A. L. 2000. An evaluation of video playback using *Xiphophorus helleri*. *Animal Behaviour*, **59**, 83-89.
2. Trainor, B. C. & Marler, C. A. 2001. Testosterone, paternal behavior, and aggression in the monogamous California mouse, *Peromyscus californicus*. *Hormones and Behavior*, **40**, 32-42.
3. Trainor, B. C. & Marler, C. A. 2002. Testosterone promotes paternal behaviour in a monogamous mammal via conversion to oestrogen. *Proceedings of the Royal Society of London Series B*, **269**, 823-829.
4. Basolo, A. L. & Trainor, B. C. 2002. The conformation of a female preference for a composite male trait in green swordtails. *Animal Behaviour*, **63**, 469-474.
5. Marler, C. A., Bester-Meredith, J. K. & Trainor, B. C. 2003. Paternal behavior and aggression: Endocrine mechanisms and nongenomic transmission of behavior. *Advances in the Study of Behavior*, **32**, 263-323.
6. Trainor, B. C., Rouse, K. L. & Marler, C. A. 2003. Arginine vasotocin interacts with the social environment to regulate advertisement calling in the gray treefrog (*Hyla versicolor*). *Brain*

Behavior and Evolution, **61**, 165-171.

7. Trainor, B. C., Bird, I. M., Alday, N. A., Schlinger, B. A. & Marler, C. A. 2003. Variation in aromatase activity in the medial preoptic area and plasma progesterone is associated with the onset of paternal behavior. *Neuroendocrinology*, **78**, 36-44.
8. Trainor, B. C., Bird, I. M. & Marler, C. A. 2004. Opposing hormonal mechanisms of aggression revealed through short-lived testosterone manipulations and multiple winning experiences. *Hormones and Behavior*, **45**, 115-121.
9. Marler, C. A., Oyegbile, T., Plavicki, J. & Trainor, B. C. 2005. Response to Wingfield Commentary on "A continuing saga: the role of testosterone in aggression". *Hormones and Behavior*, **48**, 256-258.
10. Marler, C. A., Trainor, B. C., Davis, E. S. 2005. Aggression and paternal behavior. *Current Directions in Psychological Science*, **14**, 163-166.
11. Trainor, B. C. & Basolo, A. L. 2006. Location, location, location: stripe position effects on female sword preference. *Animal Behaviour*, **71**, 135-140.
12. Nelson, R. J., Trainor, B. C., Chiavegatto, S. & Demas, G. E. 2006. Pleiotropic contributions of neuronal nitric oxide synthase (NOS-1) to aggressive behavior. *Neuroscience and Biobehavioral Reviews*, **30**, 346-355
13. Trainor, B. C., Kyomen, H. H. & Marler, C. A. 2006. Estrogenic encounters: How interactions between aromatase and the environment modulate aggression. *Frontiers in Neuroendocrinology*, **27**, 170-179.
14. Trainor, B. C., Martin, L. B., Kuhlman, J., Greiwe, K. M. & Nelson, R. J. 2006. Social and photoperiod effects on reproduction. *General and Comparative Endocrinology*, **30**, 346-355
15. Pyter, L. M., Trainor, B. C. & Nelson, R. J. 2006. Testosterone and photoperiod interact to affect spatial learning and memory in adult male white-footed mice (*Peromyscus leucopus*). *European Journal of Neuroscience*, **23**, 3056-3062.
16. Trainor, B. C., Greiwe, K. M. & Nelson, R. J. 2006. Individual differences in ER α in select brain nuclei are associated with individual differences in aggression. *Hormones and Behavior*, **50**, 338-345.
17. Frazier, C. R. M.*, Trainor, B. C.*, Cravens, C. J.*, Whitney, T. K. & Marler, C. A. 2006. Paternal behavior influences development of aggression and vasopressin expression in male California mouse offspring. *Hormones and Behavior*, **50**, 699-707. *equal contributors.
18. Trainor, B. C. & Hofmann, H. A. 2006. Somatostatin regulates aggressive behavior in the cichlid fish, *Astatotilapia burtoni*. *Endocrinology*, **147**, 5119-5125.
19. Trainor, B. C., Workman, J. L., Jessen, R. & Nelson, R. J. 2007. Impaired nitric oxide synthase signaling dissociates social investigation and aggression. *Behavioral Neuroscience*, **121**, 362-369.
20. Trainor, B. C. & Hofmann, H. A. 2007. Somatostatin and somatostatin receptor gene expression in dominant and subordinate cichlid fish *Behavioural Brain Research*, **179**, 314-320.
21. Martin, L. B. II, Trainor, B. C., Finy, M. S., Nelson, R. J. 2007. HPA activity and neotic and anxiety-like behavior vary among *Peromyscus* species. *General and Comparative Endocrinology*, **151**, 342-350.
22. Trainor, B. C., Lin, S., Finy, M. S., Rowland, M. R. & Nelson, R. J. 2007. Photoperiod reverses the effects of estrogens on male aggression via genomic and nongenomic pathways. *Proceedings of the National Academy of Sciences U.S.A.*, **104**, 9840-9845.
23. Navara, K. J. Trainor, B. C., Nelson, R. J. 2007. Photoperiod alters macrophage responsiveness, but not expression of toll-like receptors in Siberian hamsters. *Comparative Biochemistry and Physiology*, **148**, 354-359.
24. Trainor, B. C., Rowland, M. R. & Nelson, R. J. 2007. Photoperiod affects estrogen receptor alpha, estrogen receptor beta, and aggressive behavior. *European Journal of Neuroscience* **26**, 207-218
25. Nelson, R. J. & Trainor, B. C. 2007. Neural mechanisms of aggression. *Nature Reviews Neuroscience*, **8**, 536-546.

26. Workman, J. L., Trainor, B. C., Finy, M. S. & Nelson, R. J. 2008. Effects of neuronal nitric oxide synthase and social housing of anxiety-like behavior. *Behavioural Brain Research*, **187**, 109-115.
27. Trainor, B. C., Finy, M. S. & Nelson, R. J. 2008. Estradiol rapidly increases short-day aggression in a non-seasonally breeding rodent. *Hormones and Behavior*, **53**, 192-199.
28. Trainor, B. C., Finy, M. S. & Nelson, R. J. 2008. Paternal aggression in a biparental mouse: parallels with maternal aggression. *Hormones and Behavior*, **53**, 200-207.
29. Marler, C. A., Trainor, B. C., Gleason, E., Bester-Meredith, J. K. & Becker, E. 2008. The effects of paternal behavior on offspring aggression and hormones in the biparental California mouse. In: R. J. Bridges (Ed.), *Neurobiology of the Parental Brain*, Academic Press, New York, pp. 435-448.
30. Trainor, B. C., Sisk, C. L & Nelson, R. J. 2009. Hormonal processes in the development and expression of aggressive behavior. *Hormones Brain and Behavior* 2nd Edition (Pfaff et al. eds), pp 167-203.
31. Corbin, C. J., Berger, T., Ford, J. J., Roselli, C. E., Sienkiewicz, W., Trainor, B. C., Roser, J. F., Vidal, J. D., Harada, N., and Conley, A. J. 2009. Pocrine brain aromatase cytochrome P450: isoform characterization, sexually dimorphic and spatial expression, and regulation by enzyme inhibition in neonatal boars. *Biology of Reproduction*, **81**, 388-395.
32. Trainor, B. C., Sweeney, C., and Cardiff, R. D. 2009. Isolating the effects of social interactions on cancer biology. *Cancer Prevention Research*, **2**, 843-846.
33. Trainor, B. C. and Marler, C. A. 2010. Aggression and territoriality. In: J. Moore and M. Breed (Eds.), *Encyclopedia of Animal Behavior*. Elsevier, New York, pp 30-34.
34. Trainor, B. C., Crean, K. K., Fry, W. H. D., and Sweeney, C. 2010. Activation of extracellular signal-regulated kinases in social behavior circuits during resident-intruder aggression tests. *Neuroscience*, **165**, 325-336.
35. Silva, A. L., Fry, W. H. D., Sweeney, C. and Trainor, B. C. 2010. Effects of photoperiod and experience on aggressive behavior in female California mice. *Behavioural Brain Research*, **208**, 528-534
36. Trainor, B. C., Takahashi, E., Silva, A. L., Crean, K. K., and Hostetler, C. 2010. Photoperiod and sex differences in hormonal responses to social conflict in the monogamous California mouse. *Hormones and Behavior*, **58**, 506-512.
37. Steinman, M. Q. and Trainor, B. C. 2010. Rapid effects of steroid hormones on animal behavior. *Nature Education Knowledge* 1(10):1.
38. Steinman, M. Q., Crean, K. K. and Trainor, B. C. 2011. Effects of photoperiod and food restriction on spatial memory. *European Journal of Neuroscience*, **33**, 361-370.
39. Trainor, B. C., Pride, M. C., Villalon Landeros, R., Knoblauch, N. W., Takahashi, E. Y., Silva, A. L. & Crean, K. K. 2011. Sex differences in social interaction behavior following social defeat stress in the monogamous California mouse. *PLoS One*, e17405.
40. Trainor, B. C. and Nelson, R. J. 2012. Neuroendocrinology of Aggressive Behavior, in *Handbook of Neuroendocrinology*, G. Fink et al. editors. Elsevier: San Diego, CA, pp 509-520.
41. Trainor B. C. in press. Stress responses and the mesolimbic dopamine system: social contexts and sex differences. *Hormones and Behavior*.

Manuscripts in Review

- Renn, S. C. P., Fraser, E. J., Aubin-Horth, N., Trainor, B. C., Hofmann, H. A. Females of an African cichlid fish display male-typical behavior in the absence of males.
- Villalon Landeros, R., Yoo, H. J., Morisseau, C., Fu, S., Silva, A. S., Hammock, B. D. & Trainor, B. C. Corncob bedding reverses the effects of estrogens on aggressive behavior and reduces estrogen receptor alpha expression in the brain.

Grants

Active

Title: Environmental regulation of estrogen dependent aggression/Supplement to Promote Diversity

Agency: NIMH (R01 MH85069—01A2S2)

Amount: \$72,220 direct costs

Dates: Active, 2010

PI: B. C. Trainor

Title: Environmental regulation of estrogen dependent aggression

Agency: NIMH (R01 MH85069-02)

Amount: \$900,000 direct costs

Dates: Active, 2010-2013

PI: B. C. Trainor

Title: Sex differences and social stress

Agency: NIMH (R21 MH090392-02)

Amount: \$275,000 direct costs

Dates: Active, 2010-2012

PI: B. C. Trainor

Title: Impact of chronic stress and behavioral coping on mammary tumor development, regression and recurrence in a mouse model of ErbB2-positive breast cancer.

Agency: Department of Defense IDEA Award

Amount: \$375,000 direct costs

Dates: Active, 2009-2012

Co-PI: B. C. Trainor

PI: C. Sweeney

Completed

Title: Environmental regulation of estrogen dependent aggression/Supplement to Promote Diversity

Agency: NIMH (R01 MH85069—01A2S1)

Amount: \$6000 direct costs

Dates: 2010

PI: B. C. Trainor

Title: Sex differences in depression related behavior

Agency: University of California Davis Academic Senate

Amount: \$20,569 direct costs

Dates: 2009-2010

PI: B. C. Trainor

Title: Impact of chronic stress and behavioral coping on mammary tumor development in a mouse model of ErbB2-positive breast cancer.

Agency: University of California Cancer Research Coordinating Committee

Amount: \$15,645 direct costs

Dates: 2009-2010

PI: B. C. Trainor

Title: Effect of stress in a mouse model of ErbB2-positive breast cancer

Agency: American Cancer Society Institutional Research Grant

Amount: \$30,000 direct costs

Dates: Jan 2009 – Sept. 2009

PI: B. C. Trainor

Title: Effect of stress on ErbB2 mouse model of breast cancer

Agency: California Breast Cancer Research Program IDEA Award

Amount: \$149,801 direct costs

Dates: Declined

PI: B. C. Trainor

Title: Effects of melatonin on genomic and nongenomic estrogen action

Agency: American Cancer Society Institutional Research Grant

Amount: \$30,000 direct costs

Dates: 2008-2009

PI: B. C. Trainor

Title: Estrogen receptors, photoperiod, and aggression

Agency: National Institute of Mental Health, F32 MH57535

Amount: \$166,713 direct costs

Dates: 2006-2007

PI: B. C. Trainor

Title: Aromatase regulation of paternal behavior and aggression

Agency: National Institute of Mental Health, F31 MH64328

Amount: \$46,498 direct costs

Dates: 2001-2003

PI: B. C. Trainor

Awards

Frank Beach Young Investigator Award in Behavioral Neuroendocrinology 2010

UC Davis Hellman Fellow 2010

Bursary for the Symposium on Molecular Mechanisms Influencing Aggressive Behaviours. 2004.
Novartis Foundation.

Society for Behavioral Neuroendocrinology Student Travel Award 2003.

Young Investigator Symposium at the Workshop on Steroid Hormones and Brain Function 2003.

Best Student Paper for Division of Animal Behavior in the Society for Integrative and Comparative Biology 2002.

Society for Integrative and Comparative Biology Grant-in-Aid 2001: The effects of testosterone and aromatase on aggression across multiple encounters.

UW Graduate School Vilas Travel Award 2002: Effects of a transient increase in testosterone after winning on future aggressive behavior.

UW Graduate School Vilas Travel Award 2001: Aromatization of testosterone to estradiol is an important mechanism of paternal behavior in the California mouse.

UW Department of Psychology Menzies Research Award 2000: Aromatase and paternal behavior:

Sigma Xi Grant-in-Aid 1999: The steroid control of paternal care.

UW Department of Psychology Menzies Research Award 1999: Hormonal control of parental behavior in the California mouse.

Sigma Xi Grant-in-Aid 1996: The importance of different components of the male sword in female choice (*Xiphophorus helleri*).

Nebraska Behavioral Biology Group Minigrant 1996: Predator use of chemical cues in the aquatic

environment.

Professional Service

Editorial and Reviewing Activities

Hormones and Behavior Editorial Board Member 2011-present

Ad Hoc Reviewer for: *Behavioral Ecology, Behavioral Ecology and Sociobiology, Behaviour, Biological Psychiatry, Brain Research, Developmental Psychobiology, Ethology, European J. Neurosci., Experimental Biology and Medicine, Genes, Brain, and Behavior, Hormones and Behavior, J. Biol. Rhythms, J. Comparative Psychology, J. Comparative Physiology A, J. Neurobiol., J. Neurosci., J. Mammal., Naturwissenschaften, Neuroscience Letters, Neuroscience, Physiology and Behavior, Trends in Genetics.*

Other Professional and University Service

Student Petitions, Standing Committee of the College of Letters and Science, 2008-present.

Animal Behavior Graduate Group Executive Committee, 2009-present

Psychology Undergraduate Curriculum Committee 2010-present

Psychobiology Area Head 2011-present

UC Davis Psychology Conference Judge 2010

SBN Annual Meeting Poster Judge 2010

Presentations

Invited Colloquia

Trainor, B. C. 1998. Female preference for colored components of the sword in *Xiphophorus helleri*. Ecology & Evolution Seminar. U. Nebraska-Lincoln.

Trainor, B. C. 1998. Using video playback to examine female preferences. Interdisciplinary Seminar in Animal Behavior. U. Wisconsin- Madison.

Trainor, B. C. 2001. Testosterone, aromatase, and paternal behavior in the monogamous California mouse, *Peromyscus californicus*. Invited Seminar. U. Wisconsin – Whitewater.

Trainor, B. C. 2003. Behavioral neuroendocrinology of paternal behavior and aggression in a biparental rodent. Department of Psychology. U. Wisconsin – Madison.

Trainor, B. C. 2004. Male social behavior and aromatization in biparental California mice. Department of Biology. Amherst College.

Trainor, B. C. 2005. Estrogenic encounters: How interactions between estrogen and the environment affect aggression. Department of Biology. College of Wooster.

Trainor, B. C. 2005. Estrogenic encounters: How interactions between estrogen and the environment affect aggression. Cummings School of Veterinary Medicine, Tufts University.

Trainor, B. C. 2007. Environmental regulation of estrogen dependent social behavior. Department of Psychology. University of California – Davis.

Trainor, B. C. 2007. Environmental regulation of estrogen dependent social behavior. Department of Biological Sciences. University of South Carolina.

Trainor, B. C. 2008. Environmental regulation of estrogen dependent social behavior. Department of Biology. University of California, Riverside.

Trainor, B. C. 2008. Environmental regulation of estrogen dependent social behavior. Animal Behavior Group Seminar. University of California, Davis.

Trainor, B. C. 2009. Estrogens and brain networks of aggression. Section of Integrative Biology. University of Texas, Austin.

Trainor, B. C. 2009. Is there a season for everything? Photoperiod and physiology in the California

mouse. Animal Science Seminar. University of California, Davis.

Trainor, B. C. 2010. Rapid effects of estrogens and brain networks of male aggression. Cell and Molecular Biology Department. Tulane University.

Professional Meetings

Basolo, A. L. & Trainor, B. C. 1998. Female preference for a composite trait in *Xiphophorus helleri*. Animal Behavior Society. Annual Meeting.

Trainor, B. C. & Marler, C. A. 2002. Testosterone promotes paternal behavior in a monogamous mammal through conversion to estrogen. Society for Integrative and Comparative Biology. Annual Meeting.

Trainor, B. C., Rouse, K. L. & Marler, C. A. 2002. Arginine vasotocin interacts with the social environment to regulate advertisement calling in the gray treefrog (*Hyla versicolor*). Animal Behavior Society. Annual Meeting.

Trainor, B. C. 2003. Increased medial preoptic aromatase activity is associated with the onset of estrogen dependent paternal behavior in a bi-parental rodent. Young Investigators Symposium, Workshop on Steroid Hormones and Brain Function.

Trainor, B. C. 2006. Photoperiod determines the effect of estrogen on aggressive behavior. Invited Symposium. Society for Behavioral Neuroendocrinology Annual Meeting. Pittsburgh, PA.

Trainor, B. C. 2007. Environmental mediation of estrogen dependent aggressive behavior via genomic and non-genomic mechanisms. Invited Symposium. American Psychiatric Association Annual Meeting.

Trainor, B. C. 2010. Effects of photoperiod and experience on aggressive behavior in female California mice. Invited Speaker. International Society for Research on Aggression Conference. Storrs, CT.

Trainor, B. C. 2011. Rapid effects of estradiol on aggressive behavior. Society for Behavioral Neuroendocrinology Annual Meeting, Querétaro, Mexico.

Trainor, B. C. 2011. Environmental effects on estrogen-sensitive mechanisms of aggression. Invited Speaker. North American Society for Comparative Endocrinology. Ann Arbor, MI.

Classes Taught

PSC 190, Behavioral Genetics, University of California, Davis: Fall 2007

PSC 251, Genetic Correlates of Behavior, University of California, Davis: Winter 2008, 2009

PSC 101, Introduction to Psychobiology, University of California, Davis: Spring 2008, Fall 2008, Winter & Spring 2010, Fall/Winter/Spring 2010.

PSC 218A, Principles in Animal Behavior I, University of California, Davis: Fall 2008

Trainees

Postdoctoral Trainee

Katharine Campi

Graduate Trainees

Michael Steinman (MCIP)

Sarah Laredo (Animal Behavior)

Gian Greenberg (Neuroscience)

Press Coverage

Insight NPR Interview: Antisocial mice and depression

Vancouver Sun: Wintertime aggression linked to estrogen in lab mice

<http://www.canada.com/vancouver/news/story.html?id=356d7b93-2fe5-4788-b9f9-d939cadfdbbe&k=4134>

Indianapolis Star: Light, estrogen in male mice found to affect aggression

<http://www.indystar.com/apps/pbcs.dll/article?AID=/20061022/LOCAL17/610220399/1083/LIVING01>

Medical News Today: Changing Length Of Days Reverses How Estrogen Affects Aggressiveness In Mice

<http://www.medicalnewstoday.com/medicalnews.php?newsid=54537>

Science Daily: Changing Length Of Days Reverses How Estrogen Affects Aggressiveness In Mice

<http://www.sciencedaily.com/releases/2006/10/061018150810.htm>

Healthfinder.com” Could 'Female' Hormone Affect Male Aggression?

<http://healthfinder.gov/news/newsstory.asp?docID=535558>

Society Memberships

Society for Behavioral Neuroendocrinology
Sigma Xi

Society for Neuroscience
Society for Social Neuroscience