

Leah M. Pyter

Institute for Mind and Biology
University of Chicago
940 E. 57th Street
Chicago, IL 60637
Phone: 773.834.3317
Fax: 773.702.6898
Email: pyter@uchicago.edu

Education

2002-2006	Ph.D. in Neuroscience, Ohio State University
2000-2001	M.S. in Biology, University of Illinois at Urbana
1996-1999	B.S. in Biology, University of Illinois at Urbana

Research Interests

Neuroimmune and neuroendocrine mechanisms underlying emotional state/behaviors.
Bi-directional relationship between chronic, peripheral disease and brain function.

Research Training

2007-present	Post-doctoral Fellow to Dr. Brian Prendergast, Departments of Psychology and Neurobiology, University of Chicago
2007	Post-doctoral Fellow to Dr. Martha McClintock, Institute for Mind and Biology, University of Chicago
2002-2006	Research Assistant to Dr. Randy Nelson, Departments of Neuroscience and Psychology, Ohio State University
2001-2002	Research Assistant to Dr. John Harder, Department of Evolution, Ecology and Organismal Biology, Ohio State University
1999-2001	Laboratory Research Technician and Research Assistant to Dr. Janice Bahr, Department of Molecular and Integrative Physiology, University of Illinois at Urbana
1998-1999	Undergraduate Research Assistant to Drs. Susan Fahrback and Elizabeth Capaldi, Departments of Neuroscience and Entomology, Rothamsted Institute, Harpenden, England and University of Illinois at Urbana

Professional Memberships

Psychoneuroimmunology Research Society, Society for Behavioral Neuroendocrinology, and Society for Neuroscience

Honors and Awards

2009	Society for Behavioral Neuroendocrinology Travel Award (\$600)
------	--

2008	Institute for Mind and Biology Fellow Travel Award (\$500)
2007	Young Investigator Award, Society for Behavioral Neuroendocrinology (\$1,200)
2005	Society for Neuroscience Chapters Student Travel Award (\$750) Society for Behavioral Neuroendocrinology Travel Award (\$800)
2004	Edward J. Ray Travel Award for Scholarship and Service (\$750) Neuroscience Graduate Studies Program Poster Award
2003	L. Ewing Memorial Trainee Travel Award, Society for the Study of Reproduction (\$500) Professional Development Grant for Women, Critical Difference for Women (\$500)
1998	All-Academic NCAA Athlete Award

Grants (Pyter, P.I.)

1/2008-12/2010	American Cancer Society "Tumors increase depression and anxiety through neuroimmune mechanisms" PF-08-086-01-TBE (\$138,000)
12/2009-6/2010	Chicago Institute for Translational Research via National Center for Research Resources "Depression accelerates tumor onset" ULA-RR024999 (\$3,550)
6/2008-12/2008	Chicago Institute for Translational Research via National Center for Research Resources "Peripheral tumors induce depression by neuroimmune and neuroendocrine mechanisms" ULA-RR024999 (\$5,000)
7/2005-3/2006	NIMH National Research Service Award "Seasonal plasticity of brain and behavior" F31-073375 (\$68,036)

Peer-Reviewed Publications (*undergraduate collaborator)

1. **Pyter, L.M.**, *Cochrane, S.F., *Ouwenga, R.L., Patel, P.N., *Pineros, V., Prendergast, B.J. (2010) Tumors induce select cognitive impairments. *Brain, Behavior, and Immunity, in press.*
2. Paul, M.J., **Pyter, L.M.**, Freeman, D.A., Galang, J., Prendergast, B.J. (2009) Photic and non-photic seasonal cues differentially engage hypothalamic kisspeptin and RFamide-related peptide mRNA expression in Siberian hamsters. *Journal of Neuroendocrinology*, 21:1007-1014.
3. Prendergast, B.J., **Pyter, L.M.** (2009) Photoperiod history differentially impacts reproduction and immune function in adult Siberian hamsters. *Journal of Biological Rhythms*, 24:509-522.
4. **Pyter, L.M.**, *Pineros, V., Galang, J.A., McClintock, M.K., Prendergast, B.J. (2009) Peripheral tumors increase depressive-like behaviors and cytokine production and alter hypothalamic-pituitary-adrenal axis regulation. *Proceedings of the National Academy of Science*, 106: 9069-9074.

➤ Designated by Faculty of 1000 Biology as "Must Read"

5. Prendergast, B.J., Galang, J.A., Kay, L.M., **Pyter, L.M.** (2009) Influence of the olfactory bulbs on blood leukocytes and behavioral responses to infection in Siberian hamsters. *Brain Research. In press.*
6. Prendergast, B.J., **Pyter, L.M.**, Galang, J.A., Kay, L.M. (2008) Reproductive responses to photoperiod persist in olfactory bulbectomized Siberian hamsters (*Phodopus sungorus*). *Behavioural Brain Research*, 198: 159-164.
7. **Pyter, L.M.**, *Adelson, J.D., and Nelson, R.J. (2007) Photoperiod affects brain plasticity, spatial learning, and regulation of stress responses. *Endocrinology*, 148: 3402-3409.
8. Benderlioglu, Z, *Dow, E, and **Pyter, L.M.** (2007) Neonatal exposure to short days and low temperatures blunts stress response and yields low fluctuating asymmetry in Siberian hamsters. *Physiology and Behavior*, 90: 459-465.
9. **Pyter, L.M.**, Trainor, B.C., and 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.
10. Weil, Z.M., **Pyter, L.M.**, Martin, L.M., Nelson, R.J. (2006) Perinatal photoperiod organizes adult immune responses in Siberian hamsters (*Phodopus sungorus*). *American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology*, 290: R1741-R1749.
11. **Pyter, L.M.** and Nelson, R.J. (2006) Enduring effects of photoperiod on affective behaviors in Siberian hamsters (*Phodopus sungorus*). *Behavioral Neuroscience*, 120: 125-134.
12. Weil, Z.M., Bowers, S.L., **Pyter, L.M.**, and Nelson, R.J. (2006) Social interactions alter proinflammatory cytokine gene expression and behavior following endotoxin administration. *Brain, Behavior, and Immunity*, 20: 72-79.
13. **Pyter, L.M.**, Weil, Z.M., and Nelson, R.J. (2005) Effects of latitude on photoperiod-induced changes in immune response in meadow voles (*Microtus pennsylvanicus*). *Canadian Journal of Zoology*, 83: 1271-1278.
14. Nakai, M., Cook, L., **Pyter, L.M.**, Black, M., Sibona, J., Turner, R.T., Jeffery, E.H., and Bahr, J.M. (2005) Dietary soy protein and isoflavones have no significant effect on bone and a potentially negative effect on the uterus of sexually mature intact Sprague-Dawley female rats. *Menopause*, 12: 291-298.
15. **Pyter, L.M.**, *Reader, B.F., and Nelson, R.J. (2005) Short photoperiods impair spatial learning and alter hippocampal dendritic morphology in adult male white-footed mice (*Peromyscus leucopus*). *Journal of Neuroscience*, 25: 4521-4526.
16. **Pyter, L.M.**, Neigh, G.N., and Nelson, R.J. (2005) Social environment modulates photoperiodic immune and reproductive responses in adult male white-footed mice (*Peromyscus leucopus*). *American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology*, 288: R891-R896.
17. **Pyter, L.M.**, *Samuelsson, A.R., and Nelson, R.J. (2005) Photoperiod alters hypothalamic cytokine gene expression and sickness behaviors following immune challenge in female Siberian hamsters (*Phodopus sungorus*). *Neuroscience*, 131: 779-784.

18. **Pyter, L.M.**, Hotchkiss, A.K., and Nelson, R.J. (2005) Photoperiod-induced differential expression of angiogenesis genes in testes of adult *Peromyscus leucopus*. *Reproduction*, 129: 201-209.
19. Hotchkiss, A.K., **Pyter, L.M.**, Rivera, M., *Wen, J., and Nelson, R.J. (2005) Aggressive behavior increases after termination of chronic sildenafil treatment in mice. *Physiology and Behavior*, 83: 683-688.
20. Neigh, G.N., Bowers, S, **Pyter, L.M.**, Gatien, M.L., and Nelson, R.J. (2004) Pyruvate prevents restraint-induced immunosuppression via alterations in glucocorticoid responses. *Endocrinology*, 145: 4309-4319.
21. Padgett, D., Hotchkiss, A.K., **Pyter, L.M.**, Nelson, R.J., Yang, E.V., Yeh, P-E, Litsky, M, Williams, M., and Glaser, R. (2004) Epstein-Barr virus-encoded dUTPase modulates immune function and induces sickness behavior in mice. *Journal of Medical Virology*, 74: 442-448.
22. Hotchkiss, A.K., **Pyter, L.M.**, Neigh, G.N., and Nelson, R.J. (2004) Nycthemeral differences in response to restraint stress in CD-1 and C57BL/6J mice. *Physiology and Behavior*, 80: 441-447.
23. Schulz L.C., Nelson R.A., **Pyter L.M.**, and Bahr, J.M. (2003) Induction of pseudopregnancy in the American black bear (*Ursus americanus*). *Journal of Experimental Zoology Part A*, 298A: 162-166.
24. Mapes, S., Tarantal, A.F., Parker, C.R., Moran, F.M., Bahr, J.M., **Pyter, L.**, and Conley, A.J. (2002) Adrenocortical cytochrome b5 expression during fetal development of the rhesus macaque. *Endocrinology*, 143: 1451-1458.

Manuscripts in Review or in Preparation

25. **Pyter, L.M.**, Prendergast, B.J. Immune and endocrine predictors of mammary tumor onset. *In prep.*

Theses

- | | |
|------|--|
| 2006 | <i>Seasonal plasticity of physiological systems, brain, and behavior.</i> (Ph.D. dissertation, Ohio State University) |
| 2001 | <i>Interaction of EGF on FSH signaling pathway in chicken granulosa cells of small yellow follicles.</i> (Master's thesis, University of Illinois at Urbana) |

GenBank Sequence Submissions

- Phodopus sungorus*, Gonadotropin inhibitory hormone (GnIH), Accession#EU365871
- Phodopus sungorus*, KISS-1 metastasis suppressor (Kiss-1), Accession#EU365872
- Phodopus sungorus*, Interleukin-1 beta (IL-1 β), Accession#AY591917
- Phodopus sungorus*, Tumor necrosis factor (TNF), Accession#DQ358743
- Phodopus sungorus*, Deiodinase, iodothyronine, type 2 (Dio-2), Accession#EU812319
- Phodopus sungorus*, Deiodinase, type 3 (Dio-3), Accession#EU812320
- Phodopus sungorus*, 18S ribosomal RNA gene, Accession#AY591918

Peromyscus leucopus, Glucocorticoid receptor (GR), Accession#DQ358741
Peromyscus leucopus, Mineralocorticoid receptor (MR), Accession#DQ358742
Peromyscus leucopus, Vascular endothelial growth factor (VEGF), Accession#DQ358740
Peromyscus leucopus, Estrogen receptor alpha (ERα), Accession#DQ357062
Peromyscus leucopus, Tumor necrosis factor (TNF), Accession#AY608911
Peromyscus leucopus, Hypoxia-inducible factor 1 alpha subunit (Hif1α), Accession#AY591916
Peromyscus leucopus, Plasminogen activator inhibitor (Serpine1), Accession#AY591915
Peromyscus leucopus, Transforming growth factor beta receptor 3 (Tgfβ3), Accession#AY591914
Peromyscus leucopus, 18S ribosomal RNA, Accession#AY591913

Conference Presentations and Invited Talks (*award received)

2010

Pyter, L.M., El Mouatassim Bih, S., Prendergast, B.J. Peripheral tumors and brain microglial activation. Society for Neuroscience Chicago Chapter Conference, Chicago, IL.

Pyter, L.M. Cancer and depression: Neuroimmune mechanisms. University of Texas Health Science Center, San Antonio, TX.

2009

Pyter, L.M. Peripheral tumors alter brain function via neuroimmune and neuroendocrine mechanisms. Society for Neuroscience Conference, Chicago, IL.

*Pyter, L.M., Cochrane, S.F., Galang, J.A., Ouwenga, R.L., Patel, P.N., Prendergast, B.J. Mechanisms by which peripheral tumors alter brain function. Society for Behavioral Neuroendocrinology Conference, East Lansing, MI.

Pyter, L.M., Pineros, V.M., Galang, J.A., McClintock, M.K., Prendergast, B.J. Tumor-induced changes in affective state. Illinois Psychoneuroimmunology Meeting, Chicago, IL.

2008

Pyter, L.M., Pineros, V.M., Galang, J.A., McClintock, M.K., Prendergast, B.J. *Tumors induce depression and alter neuroimmune and neuroendocrine systems.* Brain Research Foundation Neuroscience Day, Chicago, IL.

Pyter, L.M., Pineros, V.M., Galang, J.A., McClintock, M.K., Prendergast, B.J. Tumors induce depression and alter neuroimmune and neuroendocrine systems. University of Chicago, Neuroscience Scientific Retreat, New Buffalo, MI.

*Pyter, L.M., Pineros, V.M., Galang, J.A., McClintock, M.K., Prendergast, B.J. *Tumors induce depression and alter neuroimmune and neuroendocrine systems.* Society for Neuroscience Conference, Washington, D.C.

Prendergast, B.J., Patel, P.N., Pyter, L.M. *Hypothalamic neuropeptide expression during photoperiod-induced and -delayed puberty in Siberian hamsters.* Society for Neuroscience Conference, Washington, D.C.

*Pyter, L.M., Pineros, V.M., Galang, J.A., McClintock, M.K., Prendergast, B.J. *Tumors induce depression and alter neuroimmune and neuroendocrine systems.* Psychoneuroimmunology Research Society Conference, Madison, WI.

2007

*Pyter, L.M., Reader, B.F., Weil, Z.M., Trainor, B.C., Nelson, R.J. *Photoperiodic plasticity of adult brain, behavior, and endocrine axes*. Society for Behavioral Neuroendocrinology Conference, Young Investigator Symposium, Pacific Grove, CA.

2006

Pyter, L.M. and Nelson, R.J. Seasonal plasticity of physiological systems, brain, and behavior. Institute for Mind and Biology Proseminar, University of Chicago, IL.

2005

Pyter, L.M. and Nelson, R.J. Seasonal plasticity of brain, and behavior. Department of Psychology, Yale University, CT.

Pyter, L.M., and Nelson, R.J. Seasonal plasticity of brain, and behavior. Department of Neurobiology and Physiology, Northwestern University, IL.

Pyter, L.M., Butcher, G.Q., Congdon, E.E., Detloff, M.R., Hoschouer, E.L., Venugopal, S., Bresnahan, J.C., Beattie, M.S. Mapping neuroscience at The Ohio State University: Graphic representations of program and individual scientific breadth and depth in association with the Carnegie Initiative on the Doctorate (CID). Society for Neuroscience Conference, Washington, D.C.

*Pyter, L.M., Nelson, R.J. Effects of photoperiod on hippocampal neurogenesis and apoptosis in adult mice. Society for Neuroscience Conference, Washington, D.C., 2005.

Nelson, R.J., Pyter, L.M. Enduring effects of photoperiod on affective behaviors. Society for Neuroscience Conference, Washington, D.C.

*Pyter, L.M. and Nelson, R.J. Effects of photoperiod on hippocampal neurogenesis in adult *Peromyscus leucopus*. Society for Behavioral Neuroendocrinology Conference, Austin, TX.

Martin II, L.B, Pyter, L.M., Nelson, R.J., Ukena, K., Tsutsui, K., Bentley, G.E. Effects of GNIH on immune activity in Siberian hamsters. Society for Behavioral Neuroendocrinology Conference, Austin, TX.

Weil, Z.M., Bowers, S.L., Pyter, L.M., Nelson, R.J. Social interactions alter cytokine gene expression and behavior following endotoxin administration. Society for Behavioral Neuroendocrinology Conference, Austin, TX.

Pyter, L.M., Butcher, G.Q., Congdon, E.E., Detloff, M.R., Hoschouer, E.L., Venugopal, S., Bresnahan, J. C., and Beattie, M.S. Mapping neuroscience at The Ohio State University: Graphic representations of program and individual scientific breadth and depth in association with the Carnegie Initiative on the Doctorate (CID). Carnegie Initiative on the Doctorate: The Big Ten Conference, Urbana, IL.

Pyter, L.M., Reader, B.F., and Nelson, R.J. Day length induces brain and behavioral plasticity in adult white-footed mice (*Peromyscus leucopus*). 19th Annual Edward F. Hayes Graduate Research Forum, Columbus, OH.

Pyter, L.M., Reader, B.F., Nelson, R.J. Day length induces brain and behavioral plasticity in adult white-footed mice (*Peromyscus leucopus*). 4th Annual OSUMC Graduate and Postgraduate Research Day, Columbus, OH.

2004

Pyter, L.M. and Nelson, R.J. Photoperiod induces brain and behavioral plasticity in adult *Peromyscus leucopus*. Society for Neuroscience Conference, San Diego, CA.

Pyter, L.M. and Nelson, R.J. Photoperiod-evoked neuroplasticity: Short days reduce spatial learning and memory performance in adult male *Peromyscus leucopus*. Society for Neuroscience Central Ohio Chapter Annual Meeting, Columbus, OH.

Reader, B.F., Pyter, L.M., Rengel, R.C., and Nelson, R.J. Effects of photoperiod on *Per1* and *ICER* gene expression in peripheral immune tissues. Denman Undergraduate Research Forum, Columbus, OH.

Pyter, L.M., Samuelsson, A.R., and Nelson, R.J. Photoperiod affects expression of cytokine genes in hypothalami of male and female *Phodopus sungorus*. Neuroscience Graduate Studies Program Recruitment Poster Session, Columbus, OH.

2003

Pyter, L.M., Hotchkiss, A.K., and Nelson, R.J. Photoperiod affects brain mass and expression of genes regulating angiogenesis in brains of adult *Peromyscus leucopus*. Society for Neuroscience Conference, New Orleans, LA.

Neigh, G.N., Pyter, L.M., Meyers, J.L., Gatien, M.L., Bowers, S., and Nelson, R.J. Pyruvate diminishes the duration of the glucocorticoid response to restraint. International Society of PsychoNeuroEndocrinology Conference, New York, NY.

*Pyter, L.M., Hotchkiss, A.K., and Nelson, R.J. Differential expression of genes regulating angiogenesis in the testes of *Peromyscus leucopus* during photoperiod-induced gonadal regression and recrudescence. Society for the Study of Reproduction Conference, Cincinnati, OH.

*Pyter, L.M., Hotchkiss, A.K., and Nelson, R.J. Photoperiod affects expression of genes regulating angiogenesis in brains of adult *Peromyscus leucopus*. Society for Behavioral Neuroendocrinology Conference, Cincinnati, OH.

Hotchkiss, A.K., Pyter, L.M., Neigh, G.N., and Nelson, R.J. Time of day influences response to restraint and food deprivation in CD-1 and C57/BIJ mice. Society for Behavioral Neuroendocrinology Conference, Cincinnati, OH.

Pyter, L.M., Hotchkiss, A.K., and Nelson, R.J. Photoperiod affects expression of genes regulating angiogenesis in brains and testes of adult *Peromyscus leucopus*. Graduate and Postgraduate Research Day, Ohio State University, Columbus, OH.

2002

He, Y., Mattern, J., Pyter, L.M., Fadem, B., and Harder, J. Plasma LH concentrations in male and female opossums (*Monodelphis domestica*) following gonadectomy and exogenous GnRH. Society for Behavioral Neuroendocrinology Conference, Amherst, MA, 2002.

2001

Cooke, L., Pyter, L., Nakai, M., Jeffery, E., and Bahr, J. Differential effects of dietary soy and isoflavones on the reproductive tract of the intact female rat. Society for the Study of Reproduction Conference, Ottawa, CA, 2001.

2000

Rivera, A., Jeffery, E., Pyter, L., and Bahr, J. Isoflavone induction of anomalies in the rat vagina and uterus. Functional Foods Retreat, Urbana, IL, 2000.

Teaching & Mentoring Experience

2007-present Undergraduate Research Mentor (9 students)

2007 Teaching Assistant, Psychoneuroimmunology, University of Chicago
 2002-2006 Undergraduate Research Mentor (8 students)
 2002 Teaching Assistant, Animal Cellular and Developmental Biology,
 Ohio State University
 2001 Teaching Assistant, Introduction to Biology, Ohio State University
 1999-2000 Teaching Assistant, Laboratory Methods in Reproductive Physiology,
 University of Illinois at Urbana
 Undergraduate Research Mentor (1 student)

Service and Outreach

2007 Poster judge at Society for Behavioral Neuroendocrinology
 Conference
 2004-2006 Elected Neuroscience Graduate Studies Program Student
 Representative, Ohio State University
 2004-2006 New Wave Representative, Ohio State University
 2005 Ohio State University Neuroscience Graduate Student
 Representative at Carnegie Initiative on the Doctorate Cross-
 Disciplinary Convening
 Brain Awareness Week exhibit volunteer, COSI Science Institute,
 Columbus, OH
 Neuroscience Education: Urban and Rural Outreach (NEURO)
 educator at Columbus Public Schools, Columbus, OH
 2004 Neuroscience Graduate Studies Program Recruitment Weekend
 Committee Member, Poster Session Chairperson, Ohio State
 University
 Brain Awareness Week exhibit volunteer, COSI Science Institute,
 Columbus, OH
 Women in Neuroscience booth volunteer, Society for Neuroscience
 Conference, San Diego, CA

Representative Press Coverage

ScienceNOW: Tumors trigger cancer blues

<http://sciencenow.sciencemag.org/cgi/content/full/2009/519/2>

Science Daily: Biological link established between tumors and depression

<http://www.sciencedaily.com/releases/2009/05/090518172440.htm>

U.S. News and World Report: Study links cancerous tumors with depression

<http://health.usnews.com/articles/health/healthday/2009/05/20/study-links-cancerous-tumors-with-depression.html>

The Scientist: Tumors spur depression

<http://www.the-scientist.com/blog/display/55696/>

ABC News: Study examines sunlight, Seasonal blahs

<http://abcnews.go.com/Technology/wireStory?id=791716>

Science Daily: Seasonal depression, Anxiety affects hamsters.

<http://www.sciencedaily.com/releases/2005/11/051125111256.htm>

Newswise: Brain learning memory melatonin seasonal affective disorder.
<http://www.newswise.com/articles/view/511774/>

News-Medical.net, World: Brains of one species of mouse actually shrink during the winter.
<http://www.news-medical.net/?id=10045>

Science Daily: Mice brains shrink during winter, impairing some learning and memory.
<http://www.sciencedaily.com/releases/2005/05/050513225145.htm>

Ad Hoc Reviewer

Anatomical Record, Brain, Behavior, and Immunity, Comparative Biochemistry and Physiology, EPA external reviewer, Endocrinology, FASEB Journal, General and Comparative Endocrinology, Journal of Comparative Physiology, Journal of Mammalogy, Journal of Neuroendocrinology, Journal of Neuroscience, Molecular Reproduction and Development, Pharmacology, Physiology and Behavior