

Curriculum Vitae
Lisa E. Goehler

E-mail: evidencebasedwellness@gmail.com

I. Education

B.S. 1981, University of Washington, Psychology

Ph.D. 1989, University of California, Los Angeles, Psychology (Physiological)

Postdoctoral, 1989-1993, Department of Cellular and Structural Biology, University of Colorado Health Sciences Center, Denver, CO

II. Professional Experience

1980-83: Research Technician, **University of Washington**, Department of Psychology

1984-86: Teaching Assistant, **UCLA** Department of Psychology

1986-88: Teaching Associate, **UCLA** Department of Psychology

1987-88: Staff Research Associate, **CURE/VA Wadsworth Medical Center**, Los Angeles

1989-93: Postdoctoral Fellow, **University of Colorado Health Sciences Center**, Department of Cellular and Structural Biology

1992-96: Adjunct Assistant Professor, **University of Denver** Graduate School of Professional Psychology,

1993-97; 1999: Instructor, **University of Colorado, Boulder**, Department of Psychology

1996-00: Research Associate, **University of Colorado, Boulder**, Department of Psychology

2000-07: Assistant Professor, **University of Virginia**, Department of Psychology

2008-14: Associate Professor of Nursing Research, **University of Virginia**, School of Nursing

III. Course Instructor

Neuroanatomy, School of Dentistry, University of Colorado Health Sciences Center, team member, Spring 1992

Physiological Psychology I & II, University of Denver Graduate School of Professional Psychology, 1992-1996

Psychology of Perception (Psyc 4165), University of Colorado, Boulder; Spring 1993, Fall 1994, Summer 1995, Fall 1999

Writing in Psychology, (technical writing; Psyc 1020 & 3020), University of Colorado, Boulder, Fall 1993-Spring 1997

Laboratory in Psychobiology (Psyc 321), University of Virginia, three sections per semester: Fall 2000-2005

Cognitive and Behavioral Neuroscience (Biol/Psyc 560; NESC 720), University of Virginia; team member Spring 2001-2004

Introduction to Psychobiology (Psyc 220), University of Virginia, Fall 2001

Mind-Body Interactions (Psych 581), University of Virginia, Spring 2003, Fall 2003-2006

Animal Physiology (Biol 323), University of Virginia, team member Spring 2003-2006

Stress, Emotions, and the Brain (Psyc 582). University of Virginia, Spring 2007

Complementary and Alternative Therapies for Health (GNUR 5003), University of Virginia, team member, Fall 2008-2011

Developmental Psychology (Psyc 230), Piedmont Virginia Community College, Fall 2011- 2013

IV. Fellowships and Grants

NIMH Predoctoral Fellowship, University of California, Los Angeles, Department of Psychology: 1983-1984

Department of Psychology Dissertation Research Award, University of California, Los Angeles; 1988

NIH Postdoctoral Fellowship, University of Colorado Health Sciences Center, 1989-1990

NIH Grant R01 MH 55283, "Cytokine to Brain Communication: Role of the Vagus" (L. Watkins, P.I.), Co-Principal Investigator, 1996-2001, \$1,000,000

NIH Grant R21 MH 64648, "Neural and Immune Cell Interactions: Two of a Kind", Principal Investigator, 2001-2003, \$200,000

NIH Grant R01 MH 50431, "Gut to Brain Pathways for Infection-Induced Anxiety" (M. Lyte, P.I.), Co-Principal Investigator, 2002-2006, \$1,000,000 (\$400,000 subcontract to L. Goehler)

NIH Grant R01 MH 68834, "Neurocircuitry of Sickness Induced Behavioral Depression," Principal Investigator, 2005-2010, \$1,020,000.

V. Honors and Awards

Mead Honored Faculty, 2003-2004, Mead Endowment at the University of Virginia (for student mentoring)

Scientific Council, Psychoneuroimmunology Research Society (PNIRS), 2006-2009, elected by membership

Editorial Board, Bratislava Medical Journal (Bratislavske Lekarske Listy), 2007

GutImpact EU workshop "Investigating the crosstalk between the gut microbiota and the host: the gut-brain axis" panel member, Warsaw, Poland, April 2007

Scientific Committee PNIRS annual meeting, Stockholm, Sweden, 2013, invited by the President

VI. Society Memberships

American Psychological Association

Association for Chemoreception Sciences

J B Johnston Club (comparative neuroscience)

Psychoneuroimmunology Research Society

International Society for Neuroimmunomodulation

Society for Neuroscience

VII. Peer-Reviewed Publications

1. Bernstein, I.L., & **Goehler, L.E.** Chronic LiCl infusions: conditioned suppression of food intake and preference. *Behavioral Neuroscience*, 97:290-298, 1983.
2. Bernstein, I.L., & **Goehler, L.E.** Vagotomy produces learned food aversions in the rat. *Behavioral Neuroscience*, 97:585-594, 1983.
3. Bernstein, I.L., **Goehler, L.E.**, & Bouton, M. E. Relative potency of foods and drinks as targets in aversion conditioning. *Behavioral and Neural Biology*, 37:134-148, 1983.
4. Bernstein, I.L., **Goehler, L.E.**, & Fenner, D. P. Learned aversions to proteins in rats on a dietary self-selection regimen. *Behavioral Neuroscience*, 98:1065-1072, 1984.
5. Bernstein, I.L., Treneer, C.M., **Goehler, L.E.**, & Murochick, E. Tumor growth in rats: conditioned suppression of food intake and preference. *Behavioral Neuroscience*, 99:818-830, 1985.

6. Skoog, K.M., Muggli, M., **Goehler, L.E.**, & Kenny, N.J. Ovarian steroid manipulation of the antidiipsogenic and thermogenic response of rats to central administration of prostaglandin E. *Behavioral Neuroscience*, 100:117-120, 1986.
7. **Goehler, L.E.**, Sternini, C., & Brecha, N.C. Calcitonin gene-related peptide immunoreactivity in the biliary pathway and liver of the guinea pig: distribution and colocalization with substance P. *Cell and Tissue Research*, 253:145-150, 1988.
8. **Goehler, L.E.**, & Sternini, C. Neuropeptide Y immunoreactivity in the mammalian liver: pattern of innervation and coexistence with tyrosine hydroxylase immunoreactivity. *Cell and Tissue Research*, 265:287-295, 1991.
9. **Goehler, L.E.**, & Finger, T.E. Functional organization of vagal reflex systems in the brainstem of the goldfish Carassius auratus. *Journal of Comparative Neurology*, 319:463-478, 1992.
10. Watkins, L.R., Wiertelak, E.P., **Goehler, L.**, Mooney-Heiberger, K., Martinez, J., Furness, L., Smith, K.P., & Maier, S.F. Neurocircuitry of illness-induced hyperalgesia. *Brain Research*, 639:283-299, 1994.
11. Watkins, L.R., Weiertelak, E.P., **Goehler, L.E.**, Smith, K.P., Martin, D., & Maier, S.F. Characterization of cytokine induced hyperalgesia. *Brain Research*, 654:15-26, 1994.
12. Watkins, L.R., **Goehler, L.E.**, Relton, J.K., Tartaglia, N., Silbert, L., Martin, D., & Maier, S.F. Blockade of interleukin-1 induced fever by subdiaphragmatic vagotomy: evidence for mediation of immune-brain communication. *Neuroscience Letters*, 183:27-31, 1995.
13. **Goehler, L.E.**, Busch, C.R., Tartaglia, N., Relton, J., Sisk, D., Maier, S.F., & Watkins, L.R. Blockade of cytokine induced conditioned taste aversion by subdiaphragmatic vagotomy: further evidence for vagal mediation of immune-brain interactions. *Neuroscience Letters*, 185:163-166, 1995.
14. Fleshner, M., **Goehler, L.E.**, Hermann, J., Relton, J.K., Maier, S.F., & Watkins, L.R. Interleukin 1 β induced corticosterone elevation and hypothalamic NE depletion is vagally mediated. *Brain Research Bulletin*, 37:605-610, 1995.
15. Watkins, L.R., **Goehler, L.E.**, Relton, J., Brewer, M.T., & Maier, S.F. Mechanisms of tumor necrosis factor- α (TNF- α) hyperalgesia. *Brain Research*, 692:244-250, 1995.
16. Watkins, L.R., Maier, S.F., & **Goehler, L.E.** Cytokine-to-brain communication: a review and analysis of alternative mechanisms. *Life Sciences*, 57:1011-1026, 1995.
17. Watkins, L.R., Maier, S.F., & **Goehler, L.E.** Immune activation: The role of proinflammatory cytokines in inflammation: illness responses and pathological pain states. *Pain*, 63:289-302, 1995.
18. **Goehler, L.E.**, & Sternini, C. Calcitonin gene-related peptide innervation of the rat hepatobiliary system. *Peptides*, 17:209-217, 1996.
19. **Goehler, L.E.**, & Finger, T.E. Visceral afferent and efferent columns in the spinal cord of the teleost, Ictalurus punctatus. *Journal of Comparative Neurology*, 371:437-447, 1996.
20. **Goehler, L.E.**, Relton, J.K., Dripps, D., Keichle, R., Tartaglia, N., Maier, S.F. & Watkins, L.R. Vagal paraganglia bind biotinylated interleukin-1 receptor antagonist: a possible mechanism for immune-to-brain communication. *Brain Research Bulletin*, 43:357-364, 1997.
21. Fleshner, M., Silbert, L.H., Deak, T., Martin, D., **Goehler, L.E.**, Maier, S.F., & Watkins, L.R. TNF- α induced corticosterone elevation but not serum protein or corticosteroid binding globulin reduction is vagally mediated. *Brain Research Bulletin*, 44:701-706, 1997.

22. Milligan, E., McGorry, M.M., Fleshner, M., Gaykema, R.P.A., **Goehler, L.E.**, Watkins, L.R. & Maier, S.F. Subdiaphragmatic vagotomy does not prevent fever following intracerebroventricular prostaglandin: further evidence for the importance of vagal afferents in immune-to-brain communication. *Brain Research*, 766:240-243, 1997.
23. Fleshner, M., **Goehler, L.E.**, Schwartz, B.A., McGorry, M. Martin, D., Watkins, L.R., & Maier, S.F. Thermogenic and corticosterone responses to intravenous cytokines (IL-1 β and TNF- α) are attenuated by subdiaphragmatic vagotomy. *Journal of Neuroimmunology*, 86:134-141, 1998.
24. Maier, S.F., **Goehler, L.E.**, Fleshner, M., & Watkins, L.R. The role of the vagus nerve in cytokine-to-brain communication. *Annals of the New York Academy of Sciences*, 840:289-300, 1998.
25. Gaykema, R.P.A., **Goehler, L.E.**, Tilders, F. J. H., Bol, J.G.M., McGorry, M.M., Maier, S.F. & Watkins, L.R. Bacterial endotoxin induces Fos immunoreactivity in primary afferent neurons of the vagus nerve. *NeuroImmunoModulation*, 5:234-240, 1998.
26. **Goehler, L.E.**, Gaykema, R.P.A., Hammack, S.E., Maier, S.F. & Watkins, L.R. Interleukin-1 induces c-Fos immunoreactivity in primary afferent neurons of the vagus nerve. *Brain Research*, 804:306-310, 1998.
27. **Goehler, L.E.**, Gaykema, R.P.A., Nguyen, K.T., J.L. Lee, Tilders, F.J.H., Maier, S.F., & Watkins, L.R. Interleukin-1 β in immune cells of the abdominal vagus nerve: an immune to nervous system link? *Journal of Neuroscience*, 17:2799-2806, 1999.
28. Hansen, M.K., Nguyen, K.T., Fleshner, M., **Goehler, L.E.**, Gaykema, R.P.A., Maier, S.F., & Watkins, L.R. Effects of vagotomy on serum endotoxin, cytokines, and corticosterone after intraperitoneal lipopolysaccharide. *American Journal of Physiology*, 278:R331-R336, 2000.
29. Van Dam, A.M.W., Bol, J.G.J.M., Gaykema, R.P.A., **Goehler, L.E.**, Maier, S.F., Watkins, L.R., & Tilders, F.J.H. Vagotomy does not inhibit high dose LPS-induced interleukin-1 β immunoreactivity in rat brain and pituitary gland. *Neuroscience Letters*, 285:169-172, 2000.
30. Gaykema, R.P.A., **Goehler, L.E.**, Hansen, M.K., Maier, S.F., & Watkins, L.R. Subdiaphragmatic vagotomy blocks interleukin-1 β -induced fever but does not reduce interleukin-1 β levels in the circulation. *Autonomic Neuroscience*, 85:72-77, 2000.
31. Hansen, M.K., Nguyen, K.T., **Goehler, L.E.**, Gaykema, R.P.A., Fleshner, M., Maier, S.F., & Watkins, L.R. Effects of vagotomy on lipopolysaccharide-induced brain interleukin-1 β protein in rats. *Autonomic Neuroscience*, 85:199-126, 2000.
32. Hansen, M.K., Daniels, S., **Goehler, L.E.**, Gaykema, R.P.A., Maier, S.F., & Watkins, L.R. Subdiaphragmatic vagotomy does not block intraperitoneal lipopolysaccharide-induced fever. *Autonomic Neuroscience*, 85:83-87, 2000.
33. **Goehler, L.E.**, Gaykema, R.P.A., Anderson, K., Hansen, M.K., Maier, S. F., & Watkins, L.R. Vagal immune-to brain communication: a visceral chemoreceptive pathway. *Autonomic Neuroscience*, 85:49-59, 2000.
34. Hansen, M.K., O'Conner, K.A., **Goehler, L.E.**, Watkins, L.R., & Maier, S.F. The contribution of the vagus nerve in interleukin 1 β -induced fever is dependent on dose. *American Journal of Physiology*, 280:R929-R934, 2001.

35. **Goehler, L.E.**, Gaykema, R.P.A., Hansen, M.K., Kleiner, J., Maier, S.F., & Watkins, L.R. Staphylococcal enterotoxin B induces fever, brain c-Fos expression and serum corticosterone in rats. *American Journal of Physiology*, 280:R1434-1439, 2001.
36. Gaykema, R.P.A., **Goehler, L.E.**, & Lyte, M. Brain response to cecal infection with *Campylobacter jejuni*: analysis with Fos immunohistochemistry. *Brain, Behavior, and Immunity*, 18:238-245, 2004. PMID: 15050651
37. Marvel, F.A., Chen, C.-C., Badr, N.A., Gaykema, R.P.A., & **Goehler, L.E.** Reversible inactivation of the dorsal vagal complex blocks lipopolysaccharide-induced social withdrawal and c-Fos expression in central autonomic nuclei. *Brain, Behavior, and Immunity*, 18:123-143, 2004. PMID: 14759590
- Commentary:** Banks, W.A. Neuroimmune networks and communication pathways: the importance of location. *Brain, Behavior, and Immunity*, 18:120-122, 2004.
38. **Goehler, L.E.**, Gaykema, R.P.A., Opitz, N., Reddaway, R., Badr, N.A., & Lyte, M. Activation in vagal afferents and central autonomic pathways: early responses to intestinal infection with *Campylobacter jejuni*. *Brain, Behavior, and Immunity*, 19:334-344, 2005. PMID: 15944073
39. Lyte M., Opitz N, **Goehler L.E.**, Gaykema R.P.A., & Overmier J.B. Recommended housing conditions and test procedures can interact to obscure a significant experimental effect. *Behavior Research Methods, Instruments and Computers*, 37:651-656, 2005. PMID: 16629298
40. **Goehler, L.E.**, Erisir, A., & Gaykema, R.P.A. Neural-immune interface in the area postrema. *Neuroscience*, 140:1415-1434, 2006. PMID: 16650942
41. Lyte, M., Wang, L., Opitz, N., Gaykema, R.P.A., & **Goehler, L.E.** Anxiety-like behavior during initial stage of infection with agent of colonic hyperplasia *Citrobacter rodentium*. *Physiology & Behavior*, 89:350-357, 2006. PMID: 16887154
42. Gaykema, R.P.A., Balachandran, M., Godbout, J.P., Johnson, R.W., & **Goehler, L.E.** Enhanced c-Fos expression in central autonomic network nuclei in aged mouse brain in response to peripheral endotoxin challenge. *Autonomic Neuroscience: Basic and Clinical*, 131:137-142, 2007. PMID: 16904952
43. Gaykema, R.P.A., Chen, C.-C., & **Goehler, L.E.** Organization of immune-responsive medullary projections to the bed nucleus of stria terminalis, central amygdala, and paraventricular nucleus of the hypothalamus: evidence for parallel viscerosensory pathways in the rat brain. *Brain Research*, 1140:130-145, 2007. PMID: 17169348
44. **Goehler, L.E.**, Lyte, M., & Gaykema, R.P.A. Invited Minireview: Infection-induced viscerosensory signals from the gut enhance anxiety: implications for psychoneuroimmunology. *Brain Behavior and Immunity*, 21:721-736, 2007. PMID: 17428636
45. **Goehler, L.E.**, Park, S.-M., Opitz, N., Lyte, M., & Gaykema, R. *Campylobacter jejuni* infection increases anxiety-like behavior in the holeboard: possible anatomical substrates for viscerosensory modulation of exploratory behavior, *Brain Behavior and Immunity* 22(3):354-66, 2008. PMID: 17920243
46. Gaykema, R.P.A., Park, S.-M., McKibbin, C.R., & **Goehler, L.E.** Lipopolysaccharide suppresses activation of the tuberomammillary histaminergic system concomitant with behavior: a novel target of immune-sensory pathways, *Neuroscience*, 152:273-287, 2008. PMID: 18082968
47. Park, S.-M., Gaykema, R.P.A., & **Goehler, L.E.** How does immune challenge inhibit ingestion of palatable food? Systemic lipopolysaccharide modulates key nodal points of feeding neurocircuitry. *Brain, Behavior and Immunity*, 22:1160-1172, 2008. PMID: 18562160

48. Rose, K.M, Taylor, A.G., Bourguignon, C., Utz, S.W., & **Goehler, L.E.** Cranial electrical stimulation: potential use in reducing sleep and mood disturbances in persons with dementia and their family caregivers. *Family and Community Health*, 31:240-246, 2008. PMID: 18552605
49. Gaykema, R.P.A., & **Goehler, L.E.** Lipopolysaccharide challenge-induced suppression of Fos in hypothalamic orexin neurons: their potential role in sickness behavior. *Brain, Behavior and Immunity*, 23:926-930, 2009. PMID: 19328847.
50. Gaykema, R.P.A., Daniels, T.E., Shapiro, N.J., Thacker, G.C., Park, S.-M., & **Goehler, L.E.** Immune challenge and satiety-related activation of both distinct and overlapping neuronal populations in the brainstem indicate parallel pathways for viscerosensory signaling. *Brain Research*, 1294:61-79, 2009. PMID: 19646973.
51. Jallo N., Bourguignon, C., Taylor, A.G., Ruiz, J., & **Goehler, L.** The biobehavioral effects of relaxation guided imagery on maternal stress. *Advances in Mind Body Medicine*, 24:12-22, 2009. PMID: 20671330
52. Taylor, A.G., **Goehler, L.E.**, Galper, D.I., Innes, K.E., & Bourguignon C. Top-down and bottom-up mechanisms in mind-body medicine: development of an integrative framework for psychophysiological research. *EXPLORE: The Journal of Science and Healing*, 6:29-41, 2010. PMID: 20129310
53. Kubera, M., Obuchowicz, E, **Goehler, L.**, Brzeszcz, J., & Maes, M. In animal models, psychosocial stress-induced (neuro)inflammation, apoptosis and reduced neurogenesis are associated to the onset of depression. *Progress in Neuro-psychopharmacology and Biological Psychiatry*. 35(3):44-759, 2011. PMID:20828592
54. Fairchild, K.D., Srinivasan, V., Moorman, J.R., Gaykema, R.P., & **Goehler, L.E.** Pathogen-induced heart rate changes associated with cholinergic nervous system activation. *American Journal of Physiology, Regulatory, Integrative and Comparative Physiology*, 300:R330-R339, 2011. PMID: 21068197
55. Gaykema, R.P.A., & **Goehler, L.E.** Ascending caudal medullary catecholamine pathways drive sickness-induced deficits in exploratory behavior: brain substrates for fatigue? *Brain, Behavior and Immunity*, 25:443-460, 2011. PMID: 21075199.
56. Maes, M., Kubera, M., Obuchowicz, E., **Goehler, L.**, & Brzeszcz, J. Depressions's multiple co-morbidities explained by (neuro)inflammatory and oxidative and nitrosative stress pathways. *Neuroendocrinology Letters*, 32:7-24, 2011.
57. Kinser, P., **Goehler, L.E.**, & Taylor, A.G. How might yoga help depression? A neurobiological perspective. *EXPLORE: The Journal of Science and Healing*, 8(2):118-126, 2012.
58. Maes, M., Berk, M., **Goehler, L.**, Song, C., Anderson, G., Galecki, P., & Leonard, B. Depression and sickness behavior are Janus-faced responses to shared inflammatory pathways. *BMC Medicine*, 10:66, 2012. doi:10.1186/1741-7015-10-66
59. Lackovicova, L., Gaykema, R.P., Banovska, L., Kiss, A., **Goehler, L.E.**, & Mravec, B. The time-course of hindbrain neuronal activity varies according to location during either intraperitoneal or subcutaneous tumor growth in rats: single Fos and dual Fos/dopamine β -hydroxylase immunohistochemistry. *Journal of Neuroimmunology*, 260(1-2):37-46, 2013.
60. Taylor A.G., Fischer-White T.G., Anderson J.G., Adelstein K.E., Murugesan M., Lewis J.E., Scott M.M., Gaykema R.P., **Goehler, L.E.** Stress, Inflammation and Pain: A Potential Role for Monocytes in Fibromyalgia-related Symptom Severity. *Stress and Health*, 32:503-513, 2016.

61. **Goehler L.E.** Commentary: Flipping the Switch on Chronic Pain. Brain, Behavior and Immunity. 79:6-7, 2019

XII. Books, Book Chapters and Commentary

- Goehler, L.E.**, & Bernstein, I.L. Cachexia and tumor necrosis factor. *Encyclopedia of Neuroscience*, 2nd ed., 287, 1996.
- Goehler, L.E.** Immunosensory signaling. In *Cytokines and Mental Health* (Z. Kronfol, ed.), Kluwer Academic/Plenum Press, 2003.
- Goehler, L.E.** Cachexia and cytokines. In *Encyclopedia of Neuroscience* (G. Adelman, B. Smith, eds.), Elsevier, 3rd ed., CD/ROM. 2004.
- Goehler L.E.** Vagal complexity: substrate for body-mind connections? Commentary on “Current perspectives: does vagus nerve constitute a self-organization complexity or a ‘hidden network’?” *Bratislava Medical Journal*, 107(8):275-276, 2006.
- Goehler, L.E.** & Gaykema, R.P.A. Immune signaling to brain: mechanisms and pathways affecting sleep. In *The Neuroimmunology of Sleep* (G. Chrousos, D.P. Cardinali, & S.R. Pandi-Perumal, eds.), Springer, pp. 119-132, 2007.
- Goehler, L.E.** Cytokines in neural signaling to the brain. In *Neuroimmune Biology Volume 6: Cytokines in the Brain*, (C. Phelps, ed.), Elsevier, pp. 337-352, 2008.
- Lyte, M., Gaykema, R.P.A. & **Goehler, L.E.** Behavioral microbiology. In *Encyclopedia of Microbiology* (M. Schaechter, ed.), Elsevier. 2009.
- Goehler, L.E.** & Gaykema, R.P.A. Neural pathways mediating behavioral changes associated with immunological challenge. *The Neuroimmunological Basis of Behavior and Mental Disorders* (A. Siegel & S. Zalcman, eds.), Springer. pp 35-58, 2008.
- Goehler, L.E.** Viscerosensory pathways in the brain. *The Science and Clinical Application of Manual Therapy* (H. King, W. Janig, M. Patterson, eds.), 2010.
- Goehler, L.E.** *Food for Thought: Changing the way we feel by changing the way we eat*. Institute for Disease Management; IBSN-10 0983246572, 2022.

IX. Technical Reports

- Bluthe, R.-M., & **Goehler, L.E.** Standardization of techniques: Protocol for subdiaphragmatic vagotomy. *CEC Concerted Action "Cytokines in the Brain."* Newsletter Vol. 2, February 1995.

X. Published Abstracts and Presentations

1. Courtney, N.D., Greenwood, M.R.C., Courtney, D.R., **Goehler, L.E.**, Benedict, R.S., & Woods, S.C. Vagotomy reduces adipose lipoprotein lipase activity of obese (fa/fa) and normal rats. *Annual Meeting of the North American Society for the Study of Obesity*, 1982.
2. Courtney, N.D., Greenwood, M.R.C., **Goehler, L.E.**, Brunzell, J.D., & Woods, S.C. Lipoprotein lipase decreases in the denervated fat pad. *IV International Congress on Obesity*, 1983.
3. Bernstein, I.L., & **Goehler, L.E.** Vagotomy produces learned taste aversion in the rat. *Society for Neuroscience Abstracts*, 8:374, 1982.

4. **Goehler, L.E.**, & Novin, D. Hepatic vagotomy combined with sucrose supplementation yields increased body weight in rats. *Society for Neuroscience Abstracts* 10, 1984.
5. **Goehler, L.E.**, Sternini, C. & Brecha, N. Colocalization of calcitonin gene-related peptide immunoreactivity with substance P in nerve fibers innervating the hepatobiliary system of the guinea pig. *Anatomy Record*, 214:42A-43A, 1986.
6. **Goehler, L.E.**, Sternini, C., & Brecha, N. Distribution of calcitonin gene-related peptide in the biliary system of the rat and guinea pig. *Gastroenterology*, 1986.
7. **Goehler, L.E.**, Sternini, C., Brecha, N., & Novin, D. Peptidergic innervation of the vena porta of the rat. *Appetite*, 1986.
8. **Goehler, L.E.**, Sternini, C., & Brecha N. Neuropeptide Y innervation of the guinea pig liver: distribution and colocalization with tyrosine hydroxylase. *Society for Neuroscience Abstracts*, 13:296, 1987.
9. Roland, B., Grijalva, C.V., Gunion, M.W., **Goehler, L.E.** & Morley, J.E. Neuropeptide Y (NPY) facilitates recovery of feeding following lateral hypothalamic in rat. *Society for Neuroscience Abstracts*, 13:1172, 1987.
10. **Goehler, L.E.**, & Sternini, C. Effect of extrinsic denervation on calcitonin gene-related peptide immunoreactivity (CGRP-IR) in the rat hepatobiliary system. *Society for Neuroscience Abstracts*, 18:984, 1988.
11. **Goehler, L.E.**, O'Farrell, L., Rivier, J., Boublick, G. & Novin, D. The effects of neuropeptide Y on glucose output from the rabbit liver. *Society for Neuroscience Abstracts*, 15:218, 1989.
12. **Goehler, L.E.**, & Finger, T.E. Selectivity of gustatory and visceral reflex connections in the goldfish, Carrassius auratus. *Chemical Senses*, 15:584, 1990.
13. **Goehler, L.E.** Localization of putative chemosensory cells in the gut of the catfish, Ictalurus punctatus. *Chemical Senses*, 16:528, 1991.
14. **Goehler, L.E.** The distribution of autonomic and visceral sensory nerve fibers in the brainstem, spinal cord, and gut of the catfish, Ictalurus punctatus. *Society for Neuroscience Abstracts*, 17:320, 1991.
15. **Goehler, L.E.** Central projections of the splanchnic nerve in the catfish, Ictalurus punctatus. *Society for Neuroscience Abstracts*, 18, 1992.
16. **Goehler, L.E.** & Finger, T.E. Two descending pathways from the general visceral nucleus in the catfish, Ictalurus punctatus. *Society for Neuroscience Abstracts*, 19:160, 1993.
17. Maier, S.F., Weirtelak, E.P., **Goehler, L.** Martin, D., & Watkins, L.R. Illness-induced hyperalgesia: interleukin 1 β (IL-1) & IL-1 antagonist. *Society for Neuroscience Abstracts*, 19:114, 1993.
18. **Goehler, L.E.**, Relton, J., Maier, S.F., & Watkins, L.R. Biotinylated interleukin 1 receptor antagonist (IL1RA) labels paraganglia in the rat liver hilus and hepatic vagus. *Society for Neuroscience Abstracts*, 20, 1994.
19. Watkins, L.R, **Goehler, L.E.**, Relton, J., Fleshner, M., Tartaglia, N. Barter, J., Silbert, L., Hermann, J., Martin, D., Wiertelak, E.P., & Maier, S.F. Induction of illness behaviors by intraperitoneal IL-1: mediation by the subdiaphragmatic vagus. *PsychoNeuroImmunology Research Society Annual Meeting*, 1994.
20. **Goehler, L.E.**, Relton, J., Laudenslager, M., Maier, S.F., & Watkins, L.R. Biotinylated Interleukin-1 receptor antagonist binds to vagal paraganglia in diverse vertebrate species. *Society for Neuroscience Abstracts*, 21, 1995.

21. Deak, T., Fleshner, M., Meriwether, **Goehler, L.**, Watkins, L.R. Spencer, R.L., & Maier, S.F. Mechanisms of acute stressor induced changes in corticosteroid binding globulin (CBG). *Society for Neuroscience Abstracts*, 21, 1995.
22. Watkins, L.R., Deak, T., Silbert, L., Martinez, J., **Goehler, L.**, Relton, J., Martin, D., & Maier, S.F. Evidence for involvement of spinal cord glia in diverse models of hyperalgesia. *Society for Neuroscience Abstracts*, 21, 1995.
23. Watkins, L.R., Deak, T., **Goehler, L.E.**, Relton J., Martin, D., Tracey. K., & Maier, S.F. Glia involvement in diverse forms of hyperalgesia. *Eighth World Congress on Pain*, 1996.
24. **Goehler, L.E.**, Gaykema, R.P.A., Tilders, F.J.H., Maier, S.F., & Watkins, L.R. Localization of immune and inflammatory markers in the rat vagus nerve and liver hilus. *Society for Neuroscience Abstracts*, 22:88, 1996.
25. Fleshner, M., Silbert, L., Deak, T., **Goehler, L.E.**, Martin, D., Maier, S. F., & Watkins, L.R. Subdiaphragmatic vagotomy selectively blocks TNF alpha effects on carrier proteins and corticosterone. *Society for Neuroscience Abstracts*, 22:88, 1996.
26. Schwartz, B.A., Fleshner, M., Mc Gorry, M., **Goehler, L.E.**, Martin D., Maier, S.F., & Watkins, L.R. Responses to intravenous cytokines (IL-1 β and TNF α) are attenuated by subdiaphragmatic vagotomy. *Society for Neuroscience Abstracts*, 22:89, 1996.
27. **Goehler, L.E.**, Gaykema, R.P.A., Tilders, F.J.H, Maier, S.F., & Watkins, L.R. Endotoxin induces fos expression in rat vagal sensory ganglion cells. *ISNIM Proceedings*, 3:73, 1996.
28. Gaykema, R.P.A., **Goehler, L.E.**, Tilders, F.J.H., Maier, S.F. & Watkins, L.R. Fos expression in rat vagal sensory neurons after peripheral endotoxin administration is abrogated by subdiaphragmatic vagotomy. *Psychoneuroimmunology Research Society*, Boulder, CO, June 1997.
29. **Goehler L.E.**, Gaykema, R.P.A., Tilders, F.J.H., Maier, S.F. & Watkins, L.R. Immune and inflammatory cells in the rat vagus nerve and liver hilus. *Psychoneuroimmunology Research Society*, Boulder, CO, June 1997.
30. **Goehler, L.E.**, Gaykema, R.P.A., Van Dam, A.-M., Tilders, F.J.H., Milligan, E.D., McGorry, M.M., Maier, S.F., & Watkins, L.R. Endotoxin induces interleukin-1 β in the area postrema and brainstem choroid plexus. *Society for Neuroscience Abstracts*, 23:1515, 1997.
31. Gaykema, R.P.A., **Goehler, L.E.**, McGorry, M.M., Milligan E.D., Fleshner, M., Tilders, F.J.H., Maier, S.F., & Watkins, L.R. Subdiaphragmatic vagotomy inhibits Fos expression in brain and pituitary after intraperitoneal but not intravenous administration of endotoxin. *Society for Neuroscience Abstracts*, 23:1514, 1997.
32. Hinde, J.L., Milligan, E.D., McGorry, M.M., Fleshner, M., Gaykema, R.P.A., **Goehler, L.E.**, Maier, S.F., & Watkins, L.R. Subdiaphragmatic vagotomy does not prevent fever after intracerebroventricular prostaglandin E2. *Society for Neuroscience Abstracts*, 23:1515, 1997.
33. McGorry, M.M., **Goehler, L.E.**, Gaykema, R.P.A., Rudy, J.W., Maier, S.F., & Watkins, L.R. Intravenous LPS induced cFos in vagal primary afferents: attenuation by subdiaphragmatic vagotomy. *Society for Neuroscience Abstracts*, 23:1514, 1997.
34. Gaykema, R.P.A., **Goehler, L.E.** VanDam, A.-M., Tilders, F.J.H., Milligan, E.D., McGorry, M.M., Maier, S.F., & Watkins, L.R. Dose-related endotoxin-induced interleukin-1 β in the circumventricular organs and choroid plexus, *Cytokines and the Brain Satellite Symposium to the Society for Neuroscience 27th Annual Meeting*, New Orleans, LA, October 1997.

35. **Goehler, L.E.**, Nguyen, K.T., Gaykema, R.P.A., Maier, S.F., & Watkins, L.R. Interleukin-1 β in peripheral nerve and plasma after intraperitoneal lipopolysaccharide, *Cytokines and the Brain Satellite Symposium to the Society for Neuroscience 27th Annual Meeting*, New Orleans, LA, October 1997.
36. Hammack, S.E., Nguyen, K.T., Hinde, J., Gaykema, R.P.A., **Goehler, L.E.**, Maier, S.F., & Watkins, L.R. Does IL-1 β activate the vagus nerve? LPS induces IL-1 β in the vagus nerve, and intraperitoneal IL-1 b injection increase firing rate in vagal afferents. *Psychoneuroimmunology Research Society Meeting*, Bristol, UK, April 1998.
37. Gaykema, R.P.A., **Goehler, L.E.**, Nguyen, K.T., Schwartz, B.A., Bohl, M., Khorsand, J., Maier, S.F., & Watkins, L.R. Endotoxin signaling roles for vagus nerve and circumventricular organs: correlates of dose-related induction of c-Fos and interleukin-1 β . *Society for Neuroscience Abstracts*, 24:1611, 1998.
38. **Goehler, L.E.**, Gaykema, R.P.A., Khorsand, J., Kleiner, J., Schwartz, B.A., Maier, S.F., & Watkins, L.R. Staphylococcal enterotoxin B induces c-Fos immunoreactivity in rat nervous system. *Society for Neuroscience Abstracts*, 24:1611, 1998.
39. Hinde, J.L., Hammack, S.E., Gaykema, R.P.A., **Goehler, L.E.**, Maier, S.F., & Watkins, L.R. Intraperitoneal injections of interleukin-1 α induce c-Fos immunoreactivity in vagal sensory neurons. *Society for Neuroscience Abstracts*, 24:1611, 1998.
40. Johnson, J.D., Fleshner, M., Deak, T., **Goehler, L.**, Maier, S.F., & Watkins, L.R. The role of the vagus nerve in immune responses. *Society for Neuroscience Abstracts*, 24:1611, 1998.
41. **Goehler, L.E.**, Gaykema, R.P.A., Khorsand, J.L., Armstrong, C.B., Maier, S.F., & Watkins, L.R. Staphylococcus enterotoxin B (SEB) induces c-Fos expression in brain regions associated with host defense via a vagally dependent mechanism. *Psychoneuroimmunology Research Society Meeting. Neuroimmunomodulation*, 6:221, 1999.
42. Gaykema, R.P.A., **Goehler, L.E.**, Armstrong, C.B., Khorsand, J.L., S.F. Maier, & Watkins, L.R. Differential Fos expression in rat brain induced by lipopolysaccharide and staphylococcus enterotoxin B. *Neuroimmunomodulation*, 6:220, 1999.
43. Hansen, M., Nguyen, K., **Goehler, L.**, Gaykema, R., Fleshner, M., Maier, S., & Watkins, L. Intraperitoneal administration of human recombinant interleukin-1 β (IL-1 β) induces rat IL-1b protein in blood and brain: implications for immune-to-brain communication. *Neuroimmunomodulation*, 6:223, 1999.
44. Nguyen, K., Hansen, M., Fleshner, M., **Goehler, L.**, Gaykema, R., Maier, S., & Watkins, L. Effects of vagotomy on circulating levels of endotoxin, pro-inflammatory cytokines, and corticosterone following lipopolysaccharide, *Neuroimmunomodulation*, 6:238, 1999.
45. **Goehler, L.E.**, Gaykema, R.P.A., Kleiner, J., Hinde, J.L., Hansen, M.K., Maier, S.F. & Watkins, L. R. Intraperitoneal staphylococcus enterotoxin B (SEB) causes fever and serum corticosterone elevation in rats. *Society for Neuroscience Abstracts*, 25:1447, 1999.
46. Khorsand, J.L., **Goehler, L.E.**, Gaykema, R.P.A., Spencer, R.L., Tilders, F.J.H., Maier, S.F., & Watkins, L.R. Intraperitoneal staphylococcus enterotoxin B (SEB) induces interleukin-1 in immune cells within the abdominal vagus nerve in rats. *Society for Neuroscience Abstracts*, 25:1447, 1999.
47. Gaykema, R.P.A., **Goehler, L.E.**, Hansen, M.K., Kleiner, J., Maier, S.F., & Watkins, L.R. Subdiaphragmatic vagotomy blocks interleukin-1 induced fever even in the presence of circulating interleukin-1 β . *Society for Neuroscience Abstracts*, 25:1447, 1999.

48. Hansen, M.K., Nguyen, K.T., Fleshner, M., **Goehler, L.E.**, Gaykema, R.P.A., Maier, S.F., & Watkins, L.R. IL-1 β protein and IL-1 β , IL-1 receptor type 1, and IL-1 receptor accessory protein mRNA are present in normal brain and are modulated by LPS. *Society for Neuroscience Abstracts* 25:1446, 1999.
49. Hansen, M.K., Nguyen, K.T., **Goehler, L.E.**, Gaykema, R.P.A., Fleshner, M., Maier, S.F., & Watkins, L.R. Effects of vagotomy on LPS-induced brain interleukin-1 beta protein in rats. *FASEB Proceedings*, 2000.
50. Hansen, M.K., Daniels, S., **Goehler, L.E.**, Gaykema, R.P.A., Maier, S.F., & Watkins, L.R., Subdiaphragmatic vagotomy does not block intraperitoneal LPS-induced fever. *FASEB Proceedings*, 2000.
51. Gaykema, R.P.A., **Goehler, L.E.**, Hansen, M.K., Taylor, M., Maier, S.F., & Watkins, L.R. Subdiaphragmatic vagotomy blocks interleukin-1-induced fever without affecting increased circulating levels of this cytokine. *FASEB Proceedings*, 2000.
52. **Goehler, L.E.**, Gaykema, R.P.A., Maier, S.F., & Watkins, L.R. Vagal afferents innervate deep cervical and ileac lymph nodes in the rat. *Society for Neuroscience Abstracts*, 26:1184, 2000.
53. Gaykema, R.P.A., Wright, B., **Goehler, L.E.**, Maier, S.F., Watkins, L.R., Rodriguez, J.L., & Lyte, M. Subclinical bacterial infection activates central neural populations in mice. *Society for Neuroscience Abstracts*, 26:646, 2000.
54. **Goehler, L.E.**, Erisir, A., & Gaykema, R.P.A. Close anatomical associations of OX6-positive immune cells and neurons in the area postrema. *Society for Neuroscience Abstracts*, 27, 2001.
55. **Goehler, L.E.** Immunosensory signaling. *Digestion*, 63:255, 2001.
56. Lyte, M., Gaykema, R.P.A., Wright, B., & **Goehler, L.E.** Cecal infection in mice with campylobacter jejuni activates neural populations in the brain. *Digestion*, 63:272, 2001.
57. **Goehler, L.E.**, Erisir, A., Chen, C.-C., & Gaykema, R.P.A. Neural-immune interface in the area postrema: Ultrastructural evidence for functional interactions between neurons and dendritic cells. *Brain, Behavior and Immunity*, 16:185, 2002.
58. **Goehler, L.E.**, Chen, C.-C., & Gaykema, R.P.A. Immune cells in the olfactory bulb: rapid response to LPS and SEB. *Society for Neuroscience Abstracts*, 28:773.4, 2002.
59. Gaykema, R.P.A., Erisir, A., Chen, C.-C., & **Goehler, L.E.** Ultrastructural features support a dynamic interaction between immune and neural cells in the area postrema. *Society for Neuroscience Abstracts*, 28:868.9, 2002.
60. Chen, C.-C., Gaykema, R.P.A., & **Goehler, L.E.** Ascending pathways mediating illness responses in rats: modulation of bed nucleus of the stria terminalis, amygdala, and paraventricular nucleus. *Society for Neuroscience Abstracts*, 28:868.10, 2002.
61. Chen, C.-C., Badr, N.A., Marvel, F., Anderson, J., Gaykema, R.P.A., & **Goehler, L.E.** Evidence for a role of midline thalamic and brainstem projections in LPS-induced c-Fos expression in the infralimbic cortex. *Brain, Behavior and Immunity*, 17:166, 2003.
62. **Goehler, L.E.**, Chen, C.-C., Badr, N.A., Anderson, J., Buenzle, J., & Gaykema, R.P.A. Inactivation of the dorsal vagal complex blocks LPS-induced social withdrawal and c-Fos induction in the central amygdala and bed nucleus of the stria terminalis. *Brain, Behavior and Immunity*, 17:177, 2003.
63. Badr, N.A., Poole, J., Humphrey, J., Miles, J., Gaykema, R.P.A., & **Goehler, L.E.** Lipopolysaccharide impairs spontaneous alternation in mice. *Brain, Behavior and Immunity*, 17:159, 2003.

64. Gaykema, R.P.A., Chen, C.-C., Badr, N.A., Hawkins, A., & **Goehler, L.E.** Lipopolysaccharide suppresses c-Fos expression induced by exploring a novel environment. *Brain, Behavior and Immunity*, 17:177, 2003.
65. Gaykema, R.P.A., **Goehler, L.E.**, Chen, C.-C., Badr, N., & Lyte, M. Brain response to gastrointestinal infection with campylobacter jejuni in mice: analysis with c-Fos immunohistochemistry. *Brain, Behavior and Immunity*, 17:176, 2003.
66. **Goehler, L.E.**, Erisir, & Gaykema, R.P.A. Ultrastructural localization of interleukin-1 receptor type I in the mouse area postrema. *Brain, Behavior and Immunity*, 17:177, 2003.
67. Gaykema, R.P.A., Chen, C.-C., Badr, N.A., Anderson, J.E., & **Goehler, L.E.** Lipopolysaccharide-induced suppression of exploration of a novel environment and associated fos expression in the rat forebrain: reversal by inactivation of the dorsal vagal complex. *Society for Neuroscience Abstracts*, 29:105.15, 2003.
68. **Goehler, L.E.**, Erisir, A., & Gaykema, R.P.A. Interleukin-1 receptor type I immunoreactivity in the area postrema. *Society for Neuroscience Abstracts*, 29:103.21, 2003.
69. Gaykema, R.P.A., Erisir, A. & **Goehler, L.E.** Immunoreactivity for the interleukin-1 receptor type I receptor in hippocampal neurons in the mouse brain: an electron microscopic analysis. *Annual Meeting of the Psychoneuroimmunology Research Society*, Titissee, Germany, May 2004.
70. Gaykema, R.P.A., Wyan, H., Badr, N.A., & **Goehler, L.E.** Lipopolysaccharide, but not staphylococcal enterotoxin B, depresses play behavior in adolescent male rats, a novel model to assess hedonic state. *Annual Meeting of the Psychoneuroimmunology Research Society*, Titissee, Germany, May 2004.
71. **Goehler, L.E.**, Erisir, A. & Gaykema, R.P.A. Immunohistochemical detection of type 1 Interleukin-1 receptor protein in vagal sensory and paraganglia of the mouse. *Annual Meeting of the Psychoneuroimmunology Research Society*, Titissee, Germany, May 2004.
72. **Goehler, L.E.**, Lyte, M., Opitz, N. Badr, N.A., Reddaway, R., & Gaykema, R.P.A. Cecal infection with *Campylobacter jejuni* induces c-Fos expression in vagal sensory neurons in mice. *Annual Meeting of the Psychoneuroimmunology Research Society*, Titissee, Germany, May 2004.
73. Park, S.-M., Gaykema, R.P.A., Opitz, N., Lyte, M., & **Goehler, L.E.** Anxiety-like behavior following cecal infection with *Campylobacter jejuni* in mice: potential brain substrates. *Psychoneuroimmunology Research Society*, Denver, CO, June 2005.
74. **Goehler, L.E.**, Erisir, A., & Gaykema, R.P.A. Neural-immune interface in the area postrema: Immunohistochemical and ultrastructural evidence for multiple subtypes of immune sentinel cells in the rat brain. *Psychoneuroimmunology Research Society*, Denver, CO, June 2005.
75. Gaykema, R.P.A., Balachandran, M.K., Godbout, J.P., Johnson, R.W., & **Goehler, L.E.** Aging exacerbates the brain response to pro-inflammatory challenge in mice. *Psychoneuroimmunology Research Society*, Denver, CO, June 2005.
76. Park, S.-M., Gaykema, R.P.A., Opitz, N., Lyte, M., & **Goehler, L.E.** C-Fos expression implicates the basal lateral amygdala in mediating *Campylobacter jejuni* infection induced anxiety-like behavior in mice. *Society for Neuroscience Abstracts*, 1024.10. Washington, DC, 2005.
77. **Goehler, L.E.**, Erisir, A., & Gaykema, R.P.A. Immune cells in the area postrema that envelopes neurons express robust interleukin-1 β immunoreactivity following peripheral endotoxin challenge in rats. *Society for Neuroscience Abstracts*, 906.11. Washington, DC, 2005.
78. Gaykema, R.P.A., Balachandran, M.K., Godbout, J.P., Johnson, R.W., & **Goehler, L.E.** Aging-enhanced brain response to peripheral challenge with bacterial endotoxin in mice. *Society for Neuroscience Abstracts*, 216.14. Washington, DC, 2005.

79. Gaykema, R.P.A., Park, S.-M., McKibbin, C.R., & **Goehler, L.E.** Evidence for arousal systems as targets for immune effects on behavior: inhibition by LPS challenge of the tuberomammillary histaminergic system concomitant with sickness behavior. *Psychoneuroimmunology Research Society*, Miami, FL, June 2006.
80. Gaykema, R.P.A., & **Goehler, L.E.** Hypothalamic orexin neurons as a possible target for sickness behavior associated with innate immune activation: dual effects pro-inflammatory challenge. *Psychoneuroimmunology Research Society*, Miami, FL, June 2006.
81. **Goehler, L.E.**, Erisir, A., Jones, M.M., & Gaykema, R.P.A. Ultrastructural localization of Interleukin-1 immunoreactivity in forebrain circumventricular organs following systemic LPS treatment. *Psychoneuroimmunology Research Society*, Miami, FL, June 2006.
82. **Goehler, L.E.**, Opitz, N., Lyte, M., & Gaykema, R.P.A. Cecal infection with *Citrobacter rodentium* induces anxiety-like behavior concomitant with activation of vagal sensory neurons in mice. *Psychoneuroimmunology Research Society*, Miami, FL, June 2006.
83. **Goehler, L.E.**, Tyler, M., Scriver, J., & Gaykema, R.P.A. Mammary tumors induce c-Fos expression in the nucleus of the solitary tract in female rats. *Psychoneuroimmunology Research Society*, Miami, FL, June 2006.
84. Park S., Tyler M.E., Gaykema R.P., & **Goehler L.E.** Lipopolysaccharide challenge and sweetened milk consumption respectively influence rostral and caudal populations of neurons in the nucleus accumbens, but the rostral shell responds to both. Program No. 670.26. 2006 Neuroscience Meeting Planner. Atlanta, GA: Society for Neuroscience, 2006. Online.
85. Gaykema, R.P., Opitz, N., Lyte, M., & **Goehler, L.E.** Cecal infection with *Citrobacter rodentium* increases anxiety-like risk assessment behavior in the holeboard test and activates vagal sensory neurons. Program No. 166.5. 2006 Neuroscience Meeting Planner. Atlanta, GA: Society for Neuroscience, 2006. Online.
86. **Goehler, L.E.**, Jones, M., Erisir, A., & Gaykema R.P. Interleukin-1 immunoreactivity in forebrain circumventricular organs following systemic lipopolysaccharide injection: unique relationships to neuronal elements and vasculature. Program No. 128.2. 2006 Neuroscience Meeting Planner. Atlanta, GA: Society for Neuroscience, 2006. Online.
87. Gaykema, R.P.A., McKibbin, C.R., Jones, M.M., Tyler, M.E., & **Goehler, L.E.** Immune challenge activates area postrema neurons that innervate the external lateral parabrachial nucleus, a key anatomical link with forebrain circuitry implicated in sickness. 14th Annual Meeting of the Psychoneuroimmunology Research Society, May 30-June 2, 2007, Arcachon, France.
88. Park, S.-M., Gaykema, R.P., Tyler, M.E., Jones, M.M., & **Goehler, L.E.** Immune challenge with lipopolysaccharide reduces sweetened milk intake: associated c-Fos expression in the brain. 14th Annual Meeting of the Psychoneuroimmunology Research Society, May 30-June 2, 2007, Arcachon, France.
89. Gaykema, R.P.A., & **Goehler, L.E.** Difficulty waking up when sick: LPS-induced immune activation disengages central arousal network. 15th Annual Psychoneuroimmunology Research Society Meeting. *Brain, Behavior and Immunity*, 22(4, Suppl.1):19--20, 2008.
90. **Goehler, L.E.**, Thacker, G.C., & Gaykema, R.P.A. How does immune activation influence motivated behavior? Autonomic and limbic inputs drive the rostral nucleus accumbens following lipopolysaccharide injection. 15th Annual Psychoneuroimmunology Research Society Meeting. *Brain, Behavior and Immunity*, 22(4, Suppl.1):30, 2008.
91. **Goehler, L.E.**, Thacker, G.C., Shapiro, N.J., & Gaykema, R.P.A. Autonomic and limbic inputs to the rostral nucleus accumbens are activated following lipopolysaccharide injection: potential

- neural network involved in sickness behavior. Program No. 783.3. 2008 Neuroscience Meeting Planner. Washington, D.C: Society for Neuroscience, 2008. Online.
92. Gaykema, R.P.A., Shapiro, N.J., Thacker, G.C., Daniels, T.E., Park, S.-M., & **Goehler, L.E.** Immune challenge and satiety-related activation of distinct neuronal populations in the brainstem indicate parallel pathways for viscerosensory signaling. Program No. 783.11. 2008 Neuroscience Meeting Planner. Washington, D.C: Society for Neuroscience, 2008. Online.
93. Gaykema, R.P., Thacker, G.C., Shapiro, N.J., & Goehler, L.E. Immunotoxic depletion of hypothalamic noradrenergic/adrenergic input ameliorates the effects of peripheral LPS challenge on sickness behavior. 16th Annual Psychoneuroimmunology Research Society Meeting, Breckenridge, CO, 2009.
94. Goehler, L.E., & Gaykema, R.P.A. Cancer chemotherapy agents induce sickness and brain activation patterns that are similar to immune challenges in rats. 16th Annual Psychoneuroimmunology Research Society Meeting. Breckenridge, CO, 2009.
95. Goehler, L.E., Gaykema, R.P.A., & Mravic, B. Brain responses to intraperitoneal and subcutaneous tumors in rats. 16th Annual Psychoneuroimmunology Research Society Meeting. Breckenridge, CO, 2009.
96. Gaykema, R.P., Thacker, G.C., Shapiro, N.J., & Goehler, L.E. Immunotoxic lesion of hypothalamic noradrenergic/adrenergic input ameliorates the effects of peripheral LPS challenge on sickness behavior and associated brain c-Fos expression. Program No. 570.11. 2009 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2009. Online.
97. Goehler, L.E., & Gaykema, R.P.A. Cancer chemotherapy agents induce behavioral and mood symptoms in rats. Program No. 60.12. 2009 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2009. Online.

XI. Invited Symposia & Academic Colloquia

- Kansas State University, Manhattan, Kansas, USA;** Department of Anatomy Colloquium talk titled: "Immune-to-brain communication via the vagus." January 1997.
- Experimental Biology 2000, San Diego California, USA;** Symposium "The role of the vagus nerve in fever"; talk titled: "**Vagally mediated fever: a visceral chemoreceptive pathway.**" April 2000.
- 2001: A Brain-Gut Odyssey, Oxford University, Oxford, UK;** Symposium "The Neuroimmune Brain-Gut Axis"; talk titled: "**Immunosensory signaling.**" July 2001.
- American College of Neuropharmacology, San Juan, Puerto Rico, USA;** Panel "New data on the role of cytokines in attention, memory and mood"; talk titled: "**The dorsal vagal complex: immunosensory interface mediating the effects of cytokines on affect and cognition.**" December 2002
- Fifth International Symposium of Functional Gastrointestinal Disorders, Milwaukee Wisconsin, USA;** talk titled: "**Cytokines and vagal afferents: immune signaling to the brain.**" April 2003.
- Complexity in Biological Systems, Forum for the Center for Frontier Sciences, Temple University, Philadelphia, Pennsylvania, USA;** talk titled: "**Immune signaling to the brain: implications of parallel pathways in modulation of sickness symptoms.**" October 2003.
- Temple University, Philadelphia, Pennsylvania, USA;** Neuroscience Graduate Program Seminar Series; talk entitled: "**Is the immune system our sixth sense? How infection or inflammation influences autonomic, neuroendocrine and behavioral functioning.**" April 2004.

James Madison University, Harrisonburg, Virginia, USA; NSF Summer Neuroscience Research Program Seminar Series; talk titled: **"Is the immune system our sixth sense? How we know we are sick."** June 2004.

Louisiana State University Medical Center, Shreveport, Louisiana, USA; Neuroscience Seminar Speaker; talk titled: **"Is the immune system the sixth sense?"** September 2006.

University of Illinois, Urbana-Champaign, Illinois, USA; Integrative Immunology & Behavior Seminar Speaker; talk titled: **"The immune brain-gut axis: viscerosensory modulation of physiology and behavior."** December 2006.

Psychoneuroimmunology Research Society Annual Meeting, Arcachon, France; Presidential Symposium "Psychoneuroimmunology of gut-brain crosstalk" co-chair; talk titled: **"Mind-body interactions: how gut bacteria influence mood."** May 2007.

Delineating the Evidence Base for Somato-visceral Interactions and Autonomic Mechanisms of Manual Therapy, Fort Worth, Texas, USA; symposium speaker; talk titled **"Somato-visceral interaction in the brain: potential neural substrates for mind-body integration."** April 2008.

Digestive Disease Week, San Diego, California, USA; Symposium: "The Microbiome Gut-Brain Axis: Implications for Functional GI Disorders and Beyond"; talk titled **"Does the brain monitor microbial content of the gut?"** May 2008.

University of Georgia, Athens, Georgia, USA; Department of Microbiology Seminar Speaker. October 2008.

Polish Neuroscience Society, Warsaw, Poland; Symposium talk titled **"Neural pathways signaling cancer and inflammation: interface with stress-responsive brain regions."** September 2009.

Stritch School of Medicine, Loyola University, Chicago, Illinois, USA; Neuroscience Graduate Program Seminar Speaker; talk titled **"Neural substrates for immune effects on mood and behavior: clues from lipopolysaccharide challenge and cancer chemotherapy models."** March 2010.

Psychoneuroimmunology Research Society Annual Meeting, Dublin, Ireland; Symposium "From bowel to behaviour: immune regulation of the brain-gut axis"; talk titled: **"Gut feelings: pathways for influence of gut microbes on mood and behavior."** June 2010.

School of Dentistry, Ohio State University, Columbus, Ohio, USA; talk titled **"Immune-to-brain communication: how viscerosensory pathways influence stress, mood, and cognition."** July 2011.

Departments of Endocrinology and Rheumatology, University of Virginia, Charlottesville, Virginia, USA; Grand Rounds, talk entitled **"Healthy Gut, Healthy Brain: Stress, Barrier Function and Sickness."** June 2014.

XII. Service

Ad Hoc Reviewer

American Journal of Physiology: Comparative and Regulatory Physiology, Liver and Gastrointestinal Physiology, Behavioural Brain Research, Biological Psychiatry, Brain, Brain Behavior and Immunity, Brain Research, Brain Structure and Function, Bratislava Medical Journal, Circulation, Clinical Medicine: Circulatory Respiratory and Pulmonary Medicine, Endocrinology, European Journal of Neuroscience, Frontiers in Integrative Neuroscience, Journal of Applied Physiology, Journal of Experimental Biology, Journal of Neural Transmission, Journal of Neuroimmunology, Journal of Neuroscience Methods, Journal of Physiology, Life Sciences, Medicine & Science in Sports &

Exercise, Molecular Biology Reports, Molecular Neurobiology, Molecular Psychiatry, Neuroinflammation, Neuropsychopharmacology, Neurorehabilitation & Neural Repair, Neuroscience, Neuroscience Letters, Neurovirology, Nutrition, Pharmacology Biochemistry and Behavior, Physiology & Behavior, Proceedings of the National Academy of Sciences, Psychoneuroendocrinology, Stress, The Journal of Comparative Neurology

United States Funding Agencies

National Institutes of Health (USA)

MDCN3 (10) NeuroSBIR Study Section; *ad hoc* member 2002-2010

SSS-Q (10) SBIR Study Section; *ad hoc* member, 2003-2010

NNB (Neuroendocrinology, Neuroimmunology & Behavior; formerly IFCN-2) Study Section; temporary member (2/05; 6/05; 10/05; 6/06, 9/09)

NMB (Neurobiology of Motivated Behavior) Special Emphasis Panel (ZRG1 IFCN-D 03; 5/07)

Challenge Grants Panel 8 2009/10 (ZRG1 IFCN-A (58) R) RFA OD-09-003)

LAM (Neurobiology of Learning and Memory Study Section) 9/2012

National Science Foundation (USA)

Ad hoc reviewer

Department of Defense, U.S. Army Medical Research and Materiel Command, Congressionally Directed Medical Research Programs (CDMRP)

Gulf War Illness Research Program (GWIRP) 12/2013

International Funding Agencies

Technology Foundation STW (Technologiestichting STW) (The Netherlands)

Ad hoc reviewer

Slovak Research and Development Agency (Slovak Republic)

Ad hoc reviewer

Oak Ridge Associated Universities

Ad hoc reviewer Nazarbayev University Review | Winter 2013.

University of Virginia

Science Day, 2001

Brain Awareness Week, 2002

Department of Psychology- Women's Affairs Committee, 2001-2004

Undergraduate Curriculum Committee, 2004-2007

Murray Pathfinder Pre-dissertation Award Committee, 2000, 2001

Neuroscience Graduate Program-Seminar Committee, 2001-2002; 2004-2005

School of Medicine-Cells to Society Seminar Basic Science Mentor 2006, 2007, 2010-2013

School of Nursing-Dissertation Committees: Karen Rose (2005), Nancy Jallo (2007), Audrey Snyder (2007), Paula Ruffin (2009), Shannon Riedel (2012), Carol Brotherton (2012)

XIII. Outreach (selected)

Seminars

University of Virginia, Charlottesville, Virginia, USA; Medical Center Hour; talk titled: **"Mind body connection: the dorsal vagal complex and sickness behavior."** November 2004.

Women's Health Virginia, University of Richmond, Richmond, Virginia, USA; talk titled: **"Stress, homeostasis, and the vagus."** June 2013.

University of Virginia, Charlottesville, Virginia, USA; Medical Center Hour; talk titled: **"Healthy gut, healthy brain: stress, inflammation and resilience."** May 2014.

Institute for Brain Potential, Gilroy, California, USA; faculty member/consultant 2013-2025; workshops entitled "Understanding the Gut-Brain- Stress, Mood and Appetite;" "The Immune System: The Mind-Body Connection;" "Mind-Body Interactions and the Stress-Inflammation Connection;" "Who Gets Sick and Who Stays Well: Microbes, the Immune System, and the

Brain”; “The Psychobiology of Hope”; “Conscientious Eating”; “Changing the Way We Feel By Changing The Way We Eat”.

Health Quality Partners, San Diego County, California USA; 12 Annual Integration Summit speaker. Talk entitled “Microbes and the Mind: Implications for mood and behavior disorders”. November 3, 2021

Kaiser Permanente, Pasadena, California USA; Grand Rounds talk entitled “Disorders of Gut- Brain Interaction: “What happens in the gut does not stay in the gut”, November 9, 2022

Hygeia Wellness park; On-line seminar entitled “Taking back our health: What do we need to know?” February, 2024

On-line resources

Gutadvisor.com; provides brief and more in-depth information on common gut and gut-related concerns.

Gutadvisor Newsletter; provides free information on recent issues and findings related to gut and brain health in the form of a monthly newsletter.