



CURRICULUM VITAE
Monika Fleshner, PhD

I. PERSONAL INFORMATION

Address: ¹**Department of Integrative Physiology**
²**The Center for Neuroscience**
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 Boulder, CO 80309
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Monika Fleshner, PhD is a professor in the Department of Integrative Physiology, a member of the Center for Neuroscience, the director of the Stress Physiology laboratory, and the winner of the international 2019 Norman Cousins Award from the Psychoneuroimmunology Research Society and the



national 2016 Guyton Distinguished Lectureship Award from the Association of Chairs of Departments of Physiology. She teaches undergraduate and graduate immunology and has trained ~50 MS/PhD/Postdoctoral students. Her integrative research program focuses on understanding 1) the impact of acute and chronic stressor exposure (mental and physical) on behavior, neural, hormonal and immunological function; 2) how such systems interact to affect the whole organism; and 3) the mechanisms of increased stress robustness (resistance/resilience) produced by exercise, prebiotics and cannabis constituents. She has published ~195 peer-reviewed articles and has a GoogleScholar h-index of 75. Dr. Fleshner served on the editorial boards of the *Neurobiology of Stress, Brain, Behavior and Immunity* (DAMPs, Special Issue) and *Frontiers in Neuroscience*. The National Science Foundation, the National

Institutes of Health, the Department of Defense, and Mead Johnson Nutrition have previously funded her research program. Current funding is provided by the Office of Naval Research and NASA. Dr. Fleshner has served as a member of the College of Arts and Sciences Dean’s Budget Committee (2017-present), the Chair of the Boulder Faculty Assembly (BFA) Budget and Planning Committee (2014-2016), a member of the BFA Executive Committee (2014-2016), faculty associate for the Vice Chancellor for Research at the University of Colorado in Boulder (2009-2013), as President of the International Society for Exercise Immunology (ISEI, 2011-2013), and President (2011-2012) and Secretary/Treasurer (2004-2006) of the Psychoneuroimmunology Research Society (PNIRS).

II. EDUCATION

1991-1993	Postdoctoral Fellow, Neuroscience University of Colorado, Boulder, CO
1990-1991	Postdoctoral Fellow, Microbiology/Immunology University of Colorado Health Science Center, Denver CO
1988-1990	PhD, Behavioral Neuroscience University of Colorado, Boulder, CO
1986-1988	MA, Behavioral Neuroscience University of Colorado, Boulder, CO
1982-1984	BS, Psychology Iowa State University, Ames, IA

III. PROFESSIONAL ACADEMIC POSITIONS

2009-present **Professor with Tenure**



2003-2008 Department of Integrative Physiology
University of Colorado at Boulder CO
Associate Professor with Tenure

2002-present Department of Integrative Physiology
University of Colorado at Boulder CO
Faculty
Center for Neuroscience
University of Colorado, Boulder CO

1997-2003 **Assistant Professor**
Department of Integrative Physiology
University of Colorado, Boulder CO

1996-1997 **Assistant Research Professor**
Behavioral Neuroscience
University of Colorado, Boulder CO

1993-1996 **Research Associate and Instructor**
Behavioral Neuroscience
University of Colorado, Boulder CO

1993-1995 **Instructor**
Department of Psychology
University of Colorado, Denver CO

IV. LEADERSHIP/ADMINISTRATIVE POSITIONS (description of duties in IX. Service)

2018-present **Radiation Safety Committee, Vice Chair**, University of Colorado at Boulder.

2017-present **Executive Committee**, Department of Integrative Physiology, University of Colorado at Boulder.

2014-2016 **Boulder Faculty Assembly Executive Committee**, University of Colorado at Boulder.

2014-2016 **Boulder Faculty Assembly Budget and Planning Committee, Chair** (elected position), University of Colorado at Boulder.

2009-2013 **Faculty Associate**
Office of the Vice Chancellor for Research
University of Colorado at Boulder CO

2011-2012 **Psychoneuroimmunology Research Society (<https://www.pnirs.org/>)**
President (elected position)

2011-2013 **International Society for Exercise Immunology (<http://www.isci.dk/>)**
President (elected position)

2004-2006 **Psychoneuroimmunology Research Society**
Secretary/Treasurer (elected position)

V. HONORS and AWARDS

2019 Norman Cousins Award, Psychoneuroimmunology Research Society (International) https://www.pnirs.org/society/society_awards.cfm

2016 Arthur C. Guyton Distinguished Lectureship Award, Association of Chairs of Departments of Physiology (National)

2014 Boulder Faculty Assembly Service Recognition Award, University of Colorado, Boulder

2014 Student Award (Kristina Hulen) Everson Trust Undergraduate Scholarship for Women in Science

2012-2013 Excellence in Leadership Program, University of Colorado System

2013 Student Award (Parsa Ghasem) Best Poster Presentation @ Rocky Mountain Regional Neuroscience Group



2010-2013 College of CSR Reviewers, National Institutes of Health
 2010 Public Broadcast System (PBS)-*The Science of Healing*
 2009 Boulder Faculty Assembly Award-Excellence in Research
 2002 National Public Radio-*The Infinite Mind*, Featured Scientist
 2005 Independent Investigator Award, National Alliance for Research on Schizophrenia and Depression
 2001 Motor Board Honor Society, Faculty Appreciation
 1998 Young Investigator Award, Psychoneuroimmunology Research Society
 1998 Junior Faculty Development Award, University of Colorado, Boulder CO
 1997 Society for Neuroscience CNN (national and international), Featured Scientist
 1992-1994 National Institutes of Health
 Behavioral Neuroscience Postdoctoral Fellowship
 1991 National Institutes of Health
 Developmental Psychobiology Postdoctoral Fellowship
 1988 Research featured on PBS, "The Mind"
 1986-1990 National Institutes of Health Training Grant Fellowship
 1984 Phi Kappa Phi
 1984 Graduated with Honors, BS, Iowa State University, Ames, IA
 1981 Rivercade Queen Undergraduate Scholarship
 Morningside College, Sioux City, IA

VI. GRANTS: ACTIVE, PENDING and COMPLETED

i. Active

“The microbiome and responsiveness to stress: Countermeasure Strategies for improving resilience to sleep and circadian disruption”

Office of Naval Research (ONR) MURI N00014-15-1-2809

Multiple Principle Investigators (MPI), Ken Wright (Team Leader), Monika Fleshner, Chris Lowry, Fred Turek, Rob Knight, Pieter Dorrestein

Period: 2015-2020

Total Award: \$7,100,000. Fleshner Project (\$1,400,000)

“A systems-biology approach to assessing the impact of a centrifugation model of spaceflight on cross-system communication”

NASA-NSPIRES, 16-ROSBFP_PI-0079

Research Opportunities in Space Biology (ROSBio) - Solicitation of Proposals for Flight and Ground Space Biology Research

Multiple Principle Investigators, Monika Fleshner (CU), Michael Pecaunt (Loma Linda University), Christopher Wilson (Loma Linda University).

Period: 2019-2021

Total Award: \$750,000, Fleshner Subcontract (\$275,000)

ii. Pending

“Gene x Environment Interactions: Does fever trigger spontaneous seizure in the CDKL5 deficient rat model?”

ORPHAN & Lou Lou Foundation

Principal Investigator, Monika Fleshner; Co-PI, Heidi Grabenstatter

CDKL5 Program of Excellence, Pilot Grant Program

Period: 2019-2020

Total Award: \$150,000



“Cell-Derived Microparticles in Hypertension: Biomarkers, Vascular Mediators, and Therapeutic Targets”

NIH-HL-16-024, **Multiple Principle Investigators, DeSouza, Fleshner, Link, Stauffer, McQueen**

Period: 2019-2021

Total Award: \$1,200,000

“Prediabetes, Exercise, and Microparticles”

NIH, **Multiple Principle Investigators, DeSouza, Fleshner, Stauffer**

Period: 2019-2022

Total Award: \$1,150,000

iii. Completed

“Nutritional Modulation of Brain Development, Cognitive Function, Sleep, and Stress Reactivity: The Role of the Gut Microbiota”

Mead Johnson Nutrition, **Principle Investigator, Monika Fleshner**

Period: 2013-2017

Total Award: \$1,055,749

“Neurobiology of the Stress Resistant Brain”

R01-MH068283-06, NIH, **Principal Investigator, Monika Fleshner**

Period: 2010-2015

Total Award: \$1,200,000

“Extracellular Hsp72 is a DAMP Released by Stress”

IOS 1022451 NSF, **Principal Investigator, Monika Fleshner**

Period: 2010-2013

Total Award: \$539,045

“Enabling Stress Resistance with Controllable Exercise”

DARPA, W911NF-10-1-0050. Defense Science Office, **Principal Investigator**

Period: 2010-2012

Total Award: \$2,800,000

“Preventing Transition of Acute-to-Chronic Neuropathic Pain: Models, Mechanisms, and Treatment”

RO1-DE021966, NIH, **Multiple Principle Investigators (MPI) PD/PI, Linda Watkins, Monika Fleshner, Dan Barth**

Period: 2011-2016

Total Award: \$1,800,000

“Exercise Mitigates Stress-Induced Memory Disturbances”

RO3-NIMH, NIH, **Co-PI, Monika Fleshner**

Period: 2009-2012

Total Award: \$143,000

“Physiological Functions of the Gut Microbiome”

Innovative Seed Grant Program-U of CO, **Principle Investigator, Monika Fleshner**

Period: 2010-2012

Total Award: \$43,750

“Stress, Heat-Shock Proteins and Innate Immunity”

R01-AI057797-01, NIH, **Principal Investigator, Monika Fleshner**



Period: 2004-2010
Total Award: \$1,738,025

“Chemotherapy and Cognition in Older Breast Cancer Patients”
(SUBCONTRACT) NIH, *Principal Investigator, Monika Fleshner*
Period: 2004-2009
Total Award: \$154,000

“The Neurobiology of the Stress Resistant Brain”
R01-MH068283-01, NIH, *Principal Investigator, Monika Fleshner*
Period: 2004-2009
Total Award: \$1,804,225

“Prevention of the Negative Behavioral Effects of Acute Fluoxetine: Role of BDNF”
NARSAD, *Principal Investigator, Monika Fleshner*
Period: 2005-2009
Total Award: \$100,000

“Regulation of Brain IL-1 and Sickness Responses Following *E.coli* Challenge”
R21-MH NIH, *Co-Investigator, Monika Fleshner*
Period: 2007-2009
Total Award: \$403,820

Leap Associate Professor Award
University of Colorado, *Principal investigator, Monika Fleshner*
Period: 2004-2005
Total Award: \$5,000

“Stress, Exercise, and Innate Immunity”
RO3-MH60301-01, NIH, *Principal Investigator, Monika Fleshner*
Period: 1999-2001
Total Award: \$35,875

“Exercise Prevents the Immunosuppressive Effect of Stress”
RO3-AI45576-01, NIH, *Principal Investigator, Monika Fleshner*
Period: 1999-2001
Total Award: \$143,131

"Exercise, Stress and Immunity: Physiological Mechanisms"
RO1-AI48555-01, NIH, *Principal Investigator, Monika Fleshner*
Period: 2000-2004
Total Award: \$1,223,472

“Exercise and Stress Resistance: A Systems Biology Approach”
CRCW, University of Colorado, *Principal Investigator, Monika Fleshner*
Period: 2006-2007
Total Award: \$7,000

“Obesity/Insulin Resistance and Endothelial t-PA Release”
RO3-DK62061, NIH, *Co-Investigator, Monika Fleshner*
Period: 2002-2004



Total Award: \$143,131

“Arousal and Motor Performance in Older Adults”
RO3-AG20339, NIH, *Co-Investigator, Monika Fleshner*
Period: 2002-2004
Total Award: \$143,000

“Effect of Sleep Deprivation on Inflammatory Markers”
NIH, *Co-Investigator, Monika Fleshner*
Period: 2002-2004
Total Award: \$290,369

“Potential Benefits of a Physically Active Lifestyle on Immune Response to Immunization”
protocol B5009, General Clinical Research Center-Boulder Satellite, NIH, *Principal Investigator, Monika Fleshner*
Period: 2000-2002
Total Award: \$15,000

“Neural Mechanisms of the Stress-Resistant Brain”
University of Colorado, Council on Creative Work, *Principal Investigator, Monika Fleshner*
Period: 2002
Total Award: \$2,500

“The Behavioral Analysis of the Protective Effect of Exercise” Council on Research and Creative Work”
University of Colorado, *Principal Investigator, Monika Fleshner*
Period: 1999-2000
Total Award: \$6,730

Junior Faculty Development Award, University of Colorado
Principal Investigator, Monika Fleshner
Period: 1998
Total Award: \$5,000

"Stress and Immunity: Behavioral and Physiological Mechanisms
RO1-MH-4505, NIH, *Co-Investigator, Monika Fleshner*
Period: 1996-2001
Total Award: \$1,725,994

“Effects of space flight on *in vivo* immune function and bone resorption”
BioServe-NASA (SUBCONTRACT), *Principal Investigator, Monika Fleshner*
Period: 1996
Total Award: \$3,500

University of Colorado Health Sciences Center Young Investigator Award
Principal Investigator, Monika Fleshner
Period: 1991-1992
Total Award: \$3,000

VII. PUBLICATIONS
GoogleScholar



Total Citations (09.29.19): 19,397

h-index: 75

10-index: 176

i. Manuscripts / Chapters Submitted (Peer-reviewed)

*indicates 1st author is/was a student or postdoctoral fellow supervised by Dr. Fleshner

Foxx, CL; Heinze, JD; González, A; Vargas, FD; Baratta, MV; Elsayed, AI; Stewart, JR; Loupy, KM; Arnold, MR; Flux, MC; Sago, SA; Siebler, PH; Milton, LN; Lieb, MW; Hassell, JE; Smith, DG; Lee, KAK; Appiah, SA; Schaefer, SJ; Panitchpakdi, M; Sikora, NC; Weldon, KC; Stamper, CE; Schmidt, D; Duggan, DA; Nguyen, KT; Gates, CA; Schnabel, K; Vitaterna, MH; Turek, FW; **Fleshner, M**; Dorrestein, PC; Knight, R; Wright Jr, KP; Lowry, CA. *Effects of immunization with the soil-derived bacterium Mycobacterium vaccae on stress coping behaviors and cognitive performance in a “two hit” stressor model*. *Frontiers in Physiology*, section Gastrointestinal Sciences (2020) in review.

Bowers, SJ*; Thompson, RS; Mika, A, Greenwood, BN; **Fleshner, M**. *Disruption of the gut microbiome with oral antibiotic reduces core body temperature and disrupts diurnal rhythms of locomotor activity, but not sleep, in adult rats, in prep.*

ii. Manuscript/Chapters Published or In Press (Peer-Reviewed)

*indicates 1st author is/was a student or postdoctoral fellow supervised by Dr. Fleshner

Thompson, RS; Vargas, F; Dorrestein, PC; Chichlowski, M; Berg, BM; **Fleshner, M**. *Dietary prebiotics alter novel microbial dependent fecal metabolites that improve sleep*. *Scientific Reports* (2020) in press.

Bowers, SJ; Vargas, F; González, A; He, S; Jiang, P; Dorrestein, PC; Knight, R; Wright Jr, KP; Lowry, CA; **Fleshner, M**; Vitaterna, MH; Turek, FW. *Repeated sleep disruption in mice leads to persistent shifts in the fecal microbiome and metabolome*. *PLoS One* (2020) in press.

Arnold, MR; Greenwood, BN; McArthur, JA; Clark, PJ; **Fleshner, M**; Lowry, CA. *Effect of repeated voluntary or forced exercise on brainstem serotonergic systems in rats*. *Behavioral Brain Research* (2020) 378, doi: 10.1016/j.bbr.2019.112237.

Fleshner, M. *Gut-Microbial Signaling: A New Player in Stress Physiology?* *European Journal of Neuroscience*, Invited Commentary (2019) doi: 10.1111/EJN.14587.

Sprecher, K; Ritchie, H; Burke, T; Depner, C; Smits, A; Dorrestein, P; **Fleshner, M**; Knight, R; Lowry, C; Turek, F; Vitaterna, M; Wright Jr, K. *Trait-like vulnerability of higher-order cognition and ability to maintain wakefulness during combined sleep restriction and circadian misalignment*. *Sleep* (2019) 42(8): doi: 10.1093/sleep/zsz113.

Greenwood, BN; **Fleshner, M**. *Voluntary wheel running: A useful rodent model for Investigating the mechanisms of stress robustness and neural circuits of exercise motivation*. *Current Opinion in Behavioral Sciences* (2019). *Current Opinion in Behavioral Sciences*, 28:78–84.

Mika, A*; Gaffney, M; Roller, R; Hills, A; Bouchet, CA; Hulen, KA; Thompson, RS; Chichlowski, M; Berg, BM; **Fleshner, M**. *Feeding the Developing Brain: Juvenile Rats Fed Diet Rich in Prebiotics and Bioactive Milk Fractions Exhibit Reduced Anxiety-Related Behavior and Modified Gene Expression in Emotion Circuits*. *Neurosci Lett*, (2018) 677: p. 103-109.10.1016/j.neulet.2018.01.052.



Fleshner, M. and Crane, CR*. *Exosomes, DAMPs and miRNA: Features of stress physiology and immune homeostasis*. Trends in Immunology, (2017) 38 p. 63 doi: 10.1016/j.it.2017.08.002.

Thompson, RS*; Roller, R; Greenwood, BN; Knight, R; Chichlowski, M; Berg, BM; **Fleshner, M.** *Dietary prebiotics and bioactive milk fractions support early-life NREM sleep quality, REM rebound sleep recovery following acute stress and ameliorate stress-induced decrease in alpha diversity in the rat*. Frontiers in Behavioral Neuroscience, (2017) 10, 10:240. doi: 10.3389/fnbeh.2016.00240.

Lloyd, BA; Hake, HS; Ishiwata, T; Farmer, CE; Loetz, EC; **Fleshner, M.**; Bland, ST; Greenwood, BN. *Exercise Increases mTor Signaling in Brain Regions Involved in Cognition and Emotional Behavior*. Behav Brain Res, (2017) 323: p. 56-67.10.1016/j.bbr.2017.01.033.

Fleshner, M.; Frank, M; Maier, SF. *Danger Signals and Inflammasomes: Stress-Evoked Sterile Inflammation in Mood Disorders*. Neuropsychopharmacology, (2017) 42(1): p. 36-45.10.1038/npp.2016.125.

Mika, A*; Day, HE; Martinez, A; Rumian, NL; Greenwood, BN; Chichlowski, M; Berg, BM; **Fleshner, M.** *Early Life Diets with Prebiotics and Bioactive Milk Fractions Attenuate the Impact of Stress on Learned Helplessness Behaviours and Alter Gene Expression within Neural Circuits Important for Stress Resistance*. Eur J Neurosci, (2017) 45(3): p. 342-357.10.1111/ejn.13444.

Mika, A; Rumian, N; Loughridge, AB; **Fleshner, M.** *Exercise and Prebiotics Produce Stress Resistance: Converging Impacts on Stress-Protective and Butyrate-Producing Gut Bacteria*. Int Rev Neurobiol, (2016) 131: p. 165-191.10.1016/bs.irn.2016.08.004.

Speaker, KJ*; Paton, MM; Cox, SS; **Fleshner, M.** *A Single Bout of Fasting (24 H) Reduces Basal Cytokine Expression and Minimally Impacts the Sterile Inflammatory Response in the White Adipose Tissue of Normal Weight F344 Rats*. Mediators Inflamm, (2016) 2016: p. 1698071.10.1155/2016/1698071.

Reber, SO; Siebler, PH; Donner, NC; Morton, JT; Smith, DG; Kopelman, JM; Lowe, KR; Campbell, K; Fox, JH; Hassell, JE; Greenwood, BN; Jansch, C; Lechner, A; Uschold-Schmidt, N; Fuchsl, AM; Langgartner, D; Walker, FR; Hale, MW; Perez, GL; Van Treuren, W; González, A; Halweg-Edwards, AL; **Fleshner, M.** Raison, CL; Rook, GAW; Peddada, SD; Knight, R; Lowry, CA. *Immunization with a heat-killed preparation of the environmental bacterium Mycobacterium vaccae promotes stress resilience in mice*. Proc Natl Acad Sci U S A, (2016). 113(22): p. E3130-9PMC4896712.

Grace, PM; Fabisiak, TJ; Green-Fulgham, SM; Anderson, ND; Strand, KA; Kwilasz, AJ; Galer, EL; Walker, FR; Greenwood, BN; Maier, SF; **Fleshner, M.**; Watkins, LR. *Prior Voluntary Wheel Running Attenuates Neuropathic Pain*. Pain, (2016) 157(9): p. 2012-23.10.1097/j.pain.0000000000000607.

Thompson, RS*; Roller, R; Greenwood, BN; **Fleshner, M.** *Voluntary exercise increases core body temperature, improves sleep and reduces the stress-induced flattening of the diurnal rhythms in temperature and sleep*. Stress (2016) 1-13, doi: 10.1080/10253890.2016.1174852.

Mika, A.* and **Fleshner, M.**, *Early-life exercise may promote lasting brain and metabolic health through gut bacterial metabolites*. Immunol Cell Biol, (2016). 94(2): p. 151-7 doi:10.1038/icb.2015.113.



- Seetharaman, S; **Fleshner, M**; Park, CR; Diamond, DM. *Influence of Daily Social Stimulation on Behavioral and Physiological Outcomes in an Animal Model of PTSD*. Brain Behav, (2016) 6(5): p. e00458PMC4834360.
- Thompson, RS; Roller, R; Greenwood, BN; **Fleshner, M**. *Wheel Running Improves REM Sleep and Attenuates Stress-Induced Flattening of Diurnal Rhythms in F344 Rats*. Stress, (2016) 19(3): p. 312-24.10.1080/10253890.2016.1174852.
- Herrera, JJ*; Fedynska, S; Ghasem, PR; Wieman, T; Clark, PJ; Gray, N; Loetz, E; Campeau, S; **Fleshner, M**; Greenwood, BN. *Neurochemical and Behavioural Indices of Exercise Reward Are Independent of Exercise Controllability*. Eur J Neurosci, (2016) 43(9): p. 1190-202.10.1111/ejn.13193.
- Mika, A*; Bouchet, CA; Bunker, P; Hellwinkel, JE; Spence, KG; Day, HE; Campeau, S; **Fleshner, M**; Greenwood, BN. *Voluntary Exercise During Extinction of Auditory Fear Conditioning Reduces the Relapse of Fear Associated with Potentiated Activity of Striatal Direct Pathway Neurons*. Neurobiol Learn Mem, (2015) 125: p. 224-35.10.1016/j.nlm.2015.10.001.
- Mika, A*; Van Treuren, W; Gonzalez, A; Herrera, JJ; Knight, R; **Fleshner, M**. *Exercise Is More Effective at Altering Gut Microbial Composition and Producing Stable Changes in Lean Mass in Juvenile Versus Adult Male F344 Rats*. PLoS One, (2015) 10(5): p. e0125889.10.1371/journal.pone.0125889.
- Clark, PJ*; Amat, J; McConnell, SO; Ghasem, PR; Greenwood, BN; Maier, SF; **Fleshner, M**. *Running Reduces Uncontrollable Stress-Evoked Serotonin and Potentiates Stress-Evoked Dopamine Concentrations in the Rat Dorsal Striatum*. PLoS One, (2015) 10(11): p. e0141898.10.1371/journal.pone.0141898.
- Wright, KP, Jr.; Drake, AL; Frey, DJ; **Fleshner, M**; Desouza, CA; Gronfier, C; Czeisler, CA. *Influence of Sleep Deprivation and Circadian Misalignment on Cortisol, Inflammatory Markers, and Cytokine Balance*. Brain Behav Immun, (2015) 47: p. 24-34.10.1016/j.bbi.2015.01.004.
- Zoldaz, PR; Park, CR; **Fleshner, M**; Diamond, DM. *Psychosocial predator-based animal of PTSD produces physiological and behavioral sequelae and traumatic memory four months following stress onset*. Physiology and Behavior, 147 (2015) 183-192. 10.1016/j.physbeh.2015.04.032.
- Beninson, L.A.* and **Fleshner, M.**, *Exosomes in Fetal Bovine Serum Dampen Primary Macrophage IL-1beta Response to Lipopolysaccharide (LPS) Challenge*. Immunol Lett, (2015) 163(2): p. 187-92.10.1016/j.imlet.2014.10.019.
- Greenwood, BN*; Thompson, RS; Opp, MR; **Fleshner, M**. *Repeated Exposure to Conditioned Fear Stress Increases Anxiety and Delays Sleep Recovery Following Exposure to an Acute Traumatic Stressor*. Front Psychiatry, (2014) 5: p. 146.10.3389/fpsy.2014.00146.
- van Praag, H; **Fleshner, M**; Schwartz, MW; Mattson, MP. *Exercise, Energy Intake, Glucose Homeostasis, and the Brain*. J Neurosci, (2014) 34(46): p. 15139-49.10.1523/JNEUROSCI.2814-14.2014.
- Thompson, RS*; Strong, PV; Clark, PJ; Maslanik, TM; Wright, KP, Jr.; Greenwood, BN; **Fleshner, M**. *Repeated Fear-Induced Diurnal Rhythm Disruptions Predict PTSD-Like Sensitized Physiological Acute Stress Responses in F344 Rats*. Acta Physiol (Oxf), (2014) 211(2): p. 447-65.10.1111/apha.12239.



- Clark, PJ*; Ghasem, PR; Mika, A; Day, HE; Herrera, JJ; Greenwood, BN; **Fleshner, M.** *Wheel Running Alters Patterns of Uncontrollable Stress-Induced Cfos mRNA Expression in Rat Dorsal Striatum Direct and Indirect Pathways: A Possible Role for Plasticity in Adenosine Receptors.* Behav Brain Res, (2014) 272: p. 252-63.10.1016/j.bbr.2014.07.006.
- Fleshner, M;** Greenwood, BN; Yirmiya, R. *Neuronal-glia mechanisms of exercise-evoked stress robustness.* In Springer Current Topics in Behavioral Neuroscience, Behavioral Neurobiology of Stress-related Disorders, ed., M.D. Lapiz Bluhm and C. Pariante. (2014) 10.1007/7854_2014_277.
- Beninson, L.A.* and **Fleshner, M.,** *Exosomes: An Emerging Factor in Stress-Induced Immunomodulation.* Semin Immunol, (2014) 26(5): p. 394-401.10.1016/j.smim.2013.12.001.
- Beninson, LA*; Brown, PN; Loughridge, AB; Saludes, JP; Maslanik, T; Hills, AK; Woodworth, T; Craig, W; Yin, H; **Fleshner, M.** *Acute Stressor Exposure Modifies Plasma Exosome-Associated Heat Shock Protein 72 (Hsp72) and MicroRNA (Mir-142-5p and Mir-203).* PLoS One, (2014) 9(9): p. e108748.10.1371/journal.pone.0108748.
- Cox, SS*; Speaker, KJ; Beninson, LA; Craig, WC; Paton, MM; **Fleshner, M.** *Adrenergic and Glucocorticoid Modulation of the Sterile Inflammatory Response.* Brain Behav Immun, (2014) 36: p. 183-92.10.1016/j.bbi.2013.11.018.
- Speaker, KJ*; Cox, SS; Paton, MM; Serebrakian, A; Maslanik, T; Greenwood, BN; **Fleshner, M.** *Six Weeks of Voluntary Wheel Running Modulates Inflammatory Protein (MCP-1, IL-6, and IL-10) and Damp (Hsp72) Responses to Acute Stress in White Adipose Tissue of Lean Rats.* Brain Behav Immun, (2014) 39: p. 87-98.10.1016/j.bbi.2013.10.028.
- Saludes, JP; Morton, LA; Coulup, SK; Fiorini, Z; Cook, BM; Beninson, L; Chapman, ER; **Fleshner, M;** Yin, H. *Multivalency Amplifies the Selection and Affinity of Bradykinin-Derived Peptides for Lipid Nanovesicles.* Mol Biosyst, (2013) 9(8): p. 2005-9.10.1039/c3mb70109c.
- Loughridge, AB*; Greenwood, BN; Day, HE; McQueen, MB; **Fleshner, M.** *Microarray Analyses Reveal Novel Targets of Exercise-Induced Stress Resistance in the Dorsal Raphe Nucleus.* Front Behav Neurosci, (2013) 7: p. 37.10.3389/fnbeh.2013.00037.
- Thompson, RS*; Christianson, JP; Maslanik, TM; Maier, SF; Greenwood, BN; **Fleshner, M.** *Effects of Stressor Controllability on Diurnal Physiological Rhythms.* Physiol Behav, (2013) 112-113: p. 32-9.10.1016/j.physbeh.2013.02.009.
- Zoladz, PR; **Fleshner, M;** Diamond, DM. *Differential Effectiveness of Tianeptine, Clonidine and Amitriptyline in Blocking Traumatic Memory Expression, Anxiety and Hypertension in an Animal Model of PTSD.* Prog Neuropsychopharmacol Biol Psychiatry, (2013) 44: p. 1-16.10.1016/j.pnpbp.2013.01.001.
- Greenwood, BM*; **Fleshner, M.** *Mechanisms underlying the relationship between physical activity and anxiety: Animal data.* In Routledge Handbook of Physical Activity and Mental Health (2013) pp 130-142.
- Fleshner, M.** Thompson, RS; Greenwood, BN. *Impact of physical activity on diurnal rhythms: A potential mechanism for exercise-induced stress resistance and stress resilience.* In Routledge Handbook of Physical Activity and Mental Health (2013) pp 316-328.



Morton, LA; Yang, H; Saludes, JP; Fiorini, Z; Beninson, L; Chapman, ER; **Fleshner, M**; Xue, D; Yin, H. *Marcks-Ed Peptide as a Curvature and Lipid Sensor*. ACS Chem Biol, (2013) 8(1): p. 218-25.10.1021/cb300429e.

Fleshner, M. *Stress-Evoked Sterile Inflammation, Danger Associated Molecular Patterns (Damps), Microbial Associated Molecular Patterns (MAMPs) and the Inflammasome*. Brain Behav Immun, (2013) 27(1): p. 1-7.10.1016/j.bbi.2012.08.012.

Maslanik, T*; Mahaffey, L; Tannura, K; Beninson, L; Greenwood, BN; **Fleshner, M**. *The Inflammasome and Danger Associated Molecular Patterns (DAMPs) Are Implicated in Cytokine and Chemokine Responses Following Stressor Exposure*. Brain Behav Immun, (2013) 28: p. 54-62.10.1016/j.bbi.2012.10.014.

Greenwood, BN*; Spence, KG; Crevling, DM; Clark, PJ; Craig, WC; **Fleshner, M**. *Exercise-Induced Stress Resistance Is Independent of Exercise Controllability and the Medial Prefrontal Cortex*. Eur J Neurosci, (2013) 37(3): p. 469-78.10.1111/ejn.12044.

Maslanik, T*; Tannura, K; Mahaffey, L; Loughridge, AB; Beninson, L; Ursell, L; Greenwood, BN; Knight, R; **Fleshner, M**. *Commensal Bacteria and MAMPs Are Necessary for Stress-Induced Increases in Il-1beta and Il-18 but Not IL-6, IL-10 or MCP-1*. PLoS One, (2012) 7(12): p. e50636.10.1371/journal.pone.0050636.

Greenwood, BN*; Strong, PV*; Loughridge, AB; Day, HE; Clark, PJ; Mika, A; Hellwinkel, JE; Spence, KG; **Fleshner, M**. *5-HT2c Receptors in the Basolateral Amygdala and Dorsal Striatum Are a Novel Target for the Anxiolytic and Antidepressant Effects of Exercise*. PLoS One, (2012) 7(9): p. e46118.10.1371/journal.pone.0046118.

Foley, TE*; Brooks, LR; Gilligan, LJ; Burghardt, PR; Koch, LG; Britton, SL; **Fleshner, M**. *Brain Activation Patterns at Exhaustion in Rats That Differ in Inherent Exercise Capacity*. PLoS One, (2012) 7(9): p. e45415.10.1371/journal.pone.0045415.

Saludes, JP; Morton, LA; Ghosh, N; Beninson, LA; Chapman, ER; **Fleshner, M**; Yin, H. *Detection of Highly Curved Membrane Surfaces Using a Cyclic Peptide Derived from Synaptotagmin-I*. ACS Chem Biol, (2012) 7(10): p. 1629-35.10.1021/cb3002705.

Hutchinson, MR; Northcutt, AL; Hiranita, T; Wang, X; Lewis, SS; Thomas, J; van Steeg, K; Kopajtic, TA; Loram, LC; Sfregola, C; Galer, E; Miles, NE; Bland, ST; Amat, J; Rozeske, RR; Maslanik, T; Chapman, TR; Strand, KA; **Fleshner, M**; Bachtell, RK; Somogyi, AA; Yin, H; Katz, JL; Rice, KC; Maier, SF; Watkins, LR. *Opioid Activation of Toll-Like Receptor 4 Contributes to Drug Reinforcement*. J Neurosci, (2012) 32(33): p. 11187-200.10.1523/JNEUROSCI.0684-12.2012.

Speaker, K.J.* and **Fleshner, M**. *Interleukin-1 Beta: A Potential Link between Stress and the Development of Visceral Obesity*. BMC Physiol, (2012) 12: p. 8.10.1186/1472-6793-12-8.

Campisi, J*; Sharkey, C; Johnson, JD; Asea, A; Maslanik, T; Bernstein-Hanley, I; **Fleshner, M**. *Stress-Induced Facilitation of Host Response to Bacterial Challenge in F344 Rats Is Dependent on Extracellular Heat Shock Protein 72 and Independent of Alpha Beta T Cells*. Stress, (2012) 15(6): p. 637-46.10.3109/10253890.2011.653596.

Zoladz, PR; **Fleshner, M**; Diamond, DM. *Psychosocial Animal Model of PTSD Produces a Long-*



Lasting Traumatic Memory, an Increase in General Anxiety and PTSD-Like Glucocorticoid Abnormalities. Psychoneuroendocrinology, (2012) 37(9): p. 1531-45.10.1016/j.psyneuen.2012.02.007.

Greenwood, BN*; Loughridge, AB; Sadaoui, N; Christianson, JP; **Fleshner, M.** *The Protective Effects of Voluntary Exercise against the Behavioral Consequences of Uncontrollable Stress Persist Despite an Increase in Anxiety Following Forced Cessation of Exercise.* Behav Brain Res, (2012) 233(2): p. 314-21.10.1016/j.bbr.2012.05.017.

Thompson, RS*; Strong, PV; **Fleshner, M.** *Physiological Consequences of Repeated Exposures to Conditioned Fear.* Behav Sci (Basel), (2012) 2(2): p. 57-78.10.3390/bs2020057.

Maslanik, T*; Bernstein-Hanley, I; Helwig, B; **Fleshner, M.** *The Impact of Acute-Stressor Exposure on Splenic Innate Immunity: A Gene Expression Analysis.* Brain Behav Immun, (2012) 26(1): p. 142-9.10.1016/j.bbi.2011.08.006.

Zoladz, PR; Park, CR; Halonen, JD; Salim, S; Alzoubi, KH; Srivareerat, M; **Fleshner, M;** Alkadhi, KA; Diamond, DM. *Differential Expression of Molecular Markers of Synaptic Plasticity in the Hippocampus, Prefrontal Cortex, and Amygdala in Response to Spatial Learning, Predator Exposure, and Stress-Induced Amnesia.* Hippocampus, (2012) 22(3): p. 577-89.10.1002/hipo.20922.

Strong, PV*; Christianson, JP; Loughridge, AB; Amat, J; Maier, SF; **Fleshner, M;** Greenwood, BN. *5-Hydroxytryptamine 2c Receptors in the Dorsal Striatum Mediate Stress-Induced Interference with Negatively Reinforced Instrumental Escape Behavior.* Neuroscience, (2011) 197: p. 132-44.10.1016/j.neuroscience.2011.09.041.

Hains, LE; Loram, LC; Taylor, FR; Strand, KA; Wieseler, JL; Barrientos, RM; Young, JJ; Frank, MG; Sobesky, J; Martin, TJ; Eisenach, JC; Maier, SF; Johnson, JD; **Fleshner, M;** Watkins, LR. *Prior Laparotomy or Corticosterone Potentiates Lipopolysaccharide-Induced Fever and Sickness Behaviors.* J Neuroimmunol, (2011) 239(1-2): p. 53-60.10.1016/j.jneuroim.2011.08.011.

Fleshner, M. *The Gut Microbiota: A New Player in the Innate Immune Stress Response?* Brain Behav Immun, (2011) 25(3): p. 395-6.10.1016/j.bbi.2010.12.007.

Fleshner, M; Maier, SF; Lyons, DM; Raskind, MA. *The Neurobiology of the Stress-Resistant Brain.* Stress, (2011) 14(5): p. 498-502.10.3109/10253890.2011.596865.

Greenwood, B.N.* and **Fleshner, M.,** *Exercise, Stress Resistance, and Central Serotonergic Systems.* Exerc Sport Sci Rev, (2011) 39(3): p. 140-9.10.1097/JES.0b013e31821f7e45.

Greenwood, BN*; Foley, TE; Le, TV; Strong, PV; Loughridge, AB; Day, HE; **Fleshner, M.** *Long-Term Voluntary Wheel Running Is Rewarding and Produces Plasticity in the Mesolimbic Reward Pathway.* Behav Brain Res, (2011) 217(2): p. 354-62.10.1016/j.bbr.2010.11.005.

Rozeske, RR; Greenwood, BN; **Fleshner, M;** Watkins, LR; Maier, SF. *Voluntary Wheel Running Produces Resistance to Inescapable Stress-Induced Potentiation of Morphine Conditioned Place Preference.* Behav Brain Res, (2011) 219(2): p. 378-81.10.1016/j.bbr.2011.01.030.

Walsh, NP; Gleeson, M; Shephard, RJ; Gleeson, M; Woods, JA; Bishop, NC; **Fleshner, M;** Green, C; Pedersen, BK; Hoffman-Goetz, L; Rogers, CJ; Northoff, H; Abbasi, A; Simon, P. *Position*



Statement. Part One: Immune Function and Exercise. Exerc Immunol Rev, (2011) 17: p. 6-63,
<https://www.ncbi.nlm.nih.gov/pubmed/21446352>.

Greenwood, BN*; Strong, PV; **Fleshner, M.** *Lesions of the Basolateral Amygdala Reverse the Long-Lasting Interference with Shuttle Box Escape Produced by Uncontrollable Stress.* Behav Brain Res, (2010) 211(1): p. 71-6.10.1016/j.bbr.2010.03.012.

Campeau, S; Nyhuis, TJ; Kryskow, EM; Masini, CV; Babb, JA; Sasse, SK; Greenwood, BN; **Fleshner, M**; Day, HE. *Stress Rapidly Increases Alpha 1d Adrenergic Receptor Mrna in the Rat Dentate Gyrus.* Brain Res, (2010) 1323: p. 109-18.10.1016/j.brainres.2010.01.084.

Christianson, JP; Ragole, T; Amat, J; Greenwood, BN; Strong, PV; Paul, ED; **Fleshner, M**; Watkins, LR; Maier, SF. *5-Hydroxytryptamine 2c Receptors in the Basolateral Amygdala Are Involved in the Expression of Anxiety after Uncontrollable Traumatic Stress.* Biol Psychiatry, (2010) 67(4): p. 339-45.10.1016/j.biopsych.2009.09.011.

Fleshner, M. Maslanik, T; Beninson, L. *In Vivo Tissue Source and Releasing Signal of Endogenous Extracellular Hsp72.* In Heat Shock Proteins and Whole Body Physiology, (2010) 193-215.

Campeau, S; Nyhuis, TJ; Sasse, SK; Kryskow, EM; Herlihy, L; Masini, CV; Babb, JA; Greenwood, BN; **Fleshner, M**; Day, HE. *Hypothalamic Pituitary Adrenal Axis Responses to Low-Intensity Stressors Are Reduced after Voluntary Wheel Running in Rats.* J Neuroendocrinol, (2010) 22(8): p. 872-88.10.1111/j.1365-2826.2010.02007.x.

Greenwood, BN*; Strong, PV; Foley, TE; **Fleshner, M.** *A Behavioral Analysis of the Impact of Voluntary Physical Activity on Hippocampus-Dependent Contextual Conditioning.* Hippocampus, (2009) 19(10): p. 988-1001.10.1002/hipo.20534.

Strong, PV*; Greenwood, BN; **Fleshner, M.** *The Effects of the Selective 5-Ht(2c) Receptor Antagonist Sb 242084 on Learned Helplessness in Male Fischer 344 Rats.* Psychopharmacology (Berl), (2009) 203(4): p. 665-75.10.1007/s00213-008-1413-3.

Fleshner, M. Kennedy, SL; Johnson, JD; Day, HEW; and Greenwood, BN. *Exercise and Stress Resistance: Neural-Immune Mechanisms.* In: The Neuroimmunological Basis of Behavior and Mental Disorders, Springer Publishing, New York, NY (2009) 87-107.

Greenwood, BN*; Strong, PV; Brooks, L; **Fleshner, M.** *Anxiety-Like Behaviors Produced by Acute Fluoxetine Administration in Male Fischer 344 Rats Are Prevented by Prior Exercise.* Psychopharmacology (Berl), (2008) 199(2): p. 209-22.10.1007/s00213-008-1167-y.

Zoladz, PR; Park, CR; Munoz, C; **Fleshner, M**; Diamond, DM. *Tianeptine: An Antidepressant with Memory-Protective Properties.* Curr Neuropharmacol, (2008) 6(4): p. 311-21.10.2174/157015908787386096.

Johnson, JD*; Cortez, V; Kennedy, SL; Foley, TE; Hanson, H, 3rd; **Fleshner, M.** *Role of Central Beta-Adrenergic Receptors in Regulating Proinflammatory Cytokine Responses to a Peripheral Bacterial Challenge.* Brain Behav Immun, (2008) 22(7): p. 1078-86.10.1016/j.bbi.2008.03.007.

Grant, RW; Mariani, RA; Vieira, VJ; **Fleshner, M**; Smith, TP; Keylock, KT; Lowder, TW; McAuley, E; Hu, L; Chapman-Novakofski, K; Woods, JA. *Cardiovascular Exercise Intervention Improves the Primary Antibody Response to Keyhole Limpet Hemocyanin (KLH) in Previously Sedentary Older*



- Adults. Brain Behav Immun*, (2008) 22(6): p. 923-32.10.1016/j.bbi.2008.01.006.
- Sasse, SK; Greenwood, BN; Masini, CV; Nyhuis, TJ; **Fleshner, M**; Day, HE; Campeau, S. *Chronic Voluntary Wheel Running Facilitates Corticosterone Response Habituation to Repeated Audiogenic Stress Exposure in Male Rats*. *Stress*, (2008) 11(6): p. 425-37.10.1080/10253890801887453.
- Park, CR; Zoladz, PR; Conrad, CD; **Fleshner, M**; Diamond, DM. *Acute Predator Stress Impairs the Consolidation and Retrieval of Hippocampus-Dependent Memory in Male and Female Rats*. *Learn Mem*, (2008) 15(4): p. 271-80.10.1101/lm.721108.
- Zoladz, PR; Conrad, CD; **Fleshner, M**; Diamond, DM. *Acute Episodes of Predator Exposure in Conjunction with Chronic Social Instability as an Animal Model of Post-Traumatic Stress Disorder*. *Stress*, (2008) 11(4): p. 259-81.10.1080/10253890701768613.
- Foley, T.E.* and **Fleshner, M.**, *Neuroplasticity of Dopamine Circuits after Exercise: Implications for Central Fatigue*. *Neuromolecular Med*, (2008) 10(2): p. 67-80.10.1007/s12017-008-8032-3.
- Greenwood, B.N.* and **Fleshner, M.**, *Exercise, Learned Helplessness, and the Stress-Resistant Brain*. *Neuromolecular Med*, (2008) 10(2): p. 81-98.10.1007/s12017-008-8029-y.
- Campbell, AM; Park, CR; Zoladz, PR; Munoz, C; **Fleshner, M**; Diamond, DM. *Pre-Training Administration of Tianeptine, but Not Propranolol, Protects Hippocampus-Dependent Memory from Being Impaired by Predator Stress*. *Eur Neuropsychopharmacol*, (2008) 18(2): p. 87-98.10.1016/j.euroneuro.2007.04.004.
- Greenwood, BN*; Strong, PV; Dorey, AA; **Fleshner, M.** *Therapeutic Effects of Exercise: Wheel Running Reverses Stress-Induced Interference with Shuttle Box Escape*. *Behav Neurosci*, (2007) 121(5): p. 992-1000.10.1037/0735-7044.121.5.992.
- Frey, DJ; **Fleshner, M**; Wright, KP, Jr. *The Effects of 40 Hours of Total Sleep Deprivation on Inflammatory Markers in Healthy Young Adults*. *Brain Behav Immun*, (2007) 21(8): p. 1050-7.10.1016/j.bbi.2007.04.003.
- Brown, DA; Johnson, MS; Armstrong, CJ; Lynch, JM; Caruso, NM; Ehlers, LB; **Fleshner, M**; Spencer, RL; Moore, RL. *Short-Term Treadmill Running in the Rat: What Kind of Stressor Is It?* *J Appl Physiol* (1985), (2007) 103(6): p. 1979-85.10.1152/jappphysiol.00706.2007.
- Fleshner, M.** Johnson, JD; and Friedman, J; *Extracellular Hsp72: A doubled-edged sword for host defense*. In: *Heat Shock Proteins: Potent Mediators of Inflammation and Immunity* (2007) 235-263.
- Greenwood, BN*; Strong, PV; Foley, TE; Thompson, RS; **Fleshner, M.** *Learned Helplessness Is Independent of Levels of Brain-Derived Neurotrophic Factor in the Hippocampus*. *Neuroscience*, (2007) 144(4): p. 1193-208.10.1016/j.neuroscience.2006.11.007.
- Smith, TP; Kennedy, SL; Smith, M; Orent, S; **Fleshner, M.** *Physiological Improvements and Health Benefits During an Exercise-Based Comprehensive Rehabilitation Program in Medically Complex Patients*. *Exerc Immunol Rev*, (2006) 12: p. 86-96,
<https://www.ncbi.nlm.nih.gov/pubmed/17201074>.
- Fleshner, M.** *Stress-induced sympathetic nervous system activation contributes to both suppressed acquired immunity and potentiated innate immunity: The role of splenic NE depletion and*



extracellular Hsp72. In: Neural and Neuroendocrine Mechanisms in Host Defense and Autoimmunity (2006) 26-56.

- Fleshner, M.** Sharkey, CM; Nickerson, M; Johnson, JD; *Endogenous extracellular Hsp72 release is an adaptive feature of the acute stress response*. Psychoneuroimmunology, 2 (2006) 1013-1034.
- Nickerson, M*; and **Fleshner M**; *Sexual dimorphism of the stress-induced intracellular Hsp70 response: The potential role of estrogen*. Heat Shock Proteins in Biology and Medicine Research (2006) 1-17.
- Foley, TE*; Greenwood, BN; Day, HE; Koch, LG; Britton, SL; **Fleshner, M.** *Elevated Central Monoamine Receptor Mrna in Rats Bred for High Endurance Capacity: Implications for Central Fatigue*. Behav Brain Res, (2006) 174(1): p. 132-42.10.1016/j.bbr.2006.07.018.
- Ganter, MT; Ware, LB; Howard, M; Roux, J; Gartland, B; Matthey, MA; **Fleshner, M**; Pittet, JF. *Extracellular Heat Shock Protein 72 Is a Marker of the Stress Protein Response in Acute Lung Injury*. Am J Physiol Lung Cell Mol Physiol, (2006) 291(3): p. L354-61.10.1152/ajplung.00405.2005.
- Nickerson, M*; Kennedy, SL; Johnson, JD; **Fleshner, M.** *Sexual Dimorphism of the Intracellular Heat Shock Protein 72 Response*. J Appl Physiol, (2006) 101(2): p. 566-75.10.1152/jappphysiol.00259.2006.
- Fleshner, M.** *Physical activity and tyrosine supplementation: Two effective interventions against stress-induced immunosuppression*. Mineral Requirements for Military Personnel, Institute of Medicine of the National Academies (2006) 343-356.
- Dishman, RK; Berthoud, HR; Booth, FW; Cotman, CW; Edgerton, VR; **Fleshner, M**; Gandeia, SC; Gomez-Pinilla, F; Greenwood, BN; Hillman, CH; Kramer, AF; Levin, BE; Moran, TH; Russo-Neustadt, AA; Salamone, JD; Van Hoomissen, JD; Wade, CE; York, DA; Zigmond, MJ. *Neurobiology of Exercise*. Obesity (Silver Spring), (2006) 14(3): p. 345-56.10.1038/oby.2006.46.
- Park, CR; Campbell, AM; Woodson, JC; Smith, TP; **Fleshner, M**; Diamond, DM. *Permissive Influence of Stress in the Expression of a U-Shaped Relationship between Serum Corticosterone Levels and Spatial Memory Errors in Rats*. Dose Response, (2006) 4(1): p. 55-74.10.2203/dose-response.004.01.005.Park.
- Johnson, J.D.* and **Fleshner, M.**, *Releasing Signals, Secretory Pathways, and Immune Function of Endogenous Extracellular Heat Shock Protein 72*. J Leukoc Biol, (2006) 79(3): p. 425-34.10.1189/jlb.0905523.
- Nickerson, M*; Elphick, GF; Campisi, J; Greenwood, BN; **Fleshner, M.** *Physical Activity Alters the Brain Hsp72 and Il-1beta Responses to Peripheral E. Coli Challenge*. Am J Physiol Regul Integr Comp Physiol, (2005) 289(6): p. R1665-74.10.1152/ajpregu.00601.2004.
- Johnson, JD*; Campisi, J; Sharkey, CM; Kennedy, SL; Nickerson, M; **Fleshner, M.** *Adrenergic Receptors Mediate Stress-Induced Elevations in Extracellular Hsp72*. J Appl Physiol (1985), (2005) 99(5): p. 1789-95.10.1152/jappphysiol.00390.2005.
- Kennedy, SL*; Nickerson, M; Campisi, J; Johnson, JD; Smith, TP; Sharkey, C; **Fleshner, M.** *Splenic Norepinephrine Depletion Following Acute Stress Suppresses In Vivo Antibody Response*. J Neuroimmunol, (2005) 165(1-2): p. 150-60.10.1016/j.jneuroim.2005.05.001.



- Johnson, JD*; Campisi, J; Sharkey, CM; Kennedy, SL; Nickerson, M; Greenwood, BN; **Fleshner, M.** *Catecholamines Mediate Stress-Induced Increases in Peripheral and Central Inflammatory Cytokines.* Neuroscience, (2005) 135(4): p. 1295-307.10.1016/j.neuroscience.2005.06.090.
- Fleshner, M;** Johnson, JD. *Endogenous Extra-Cellular Heat Shock Protein 72: Releasing Signal(S) and Function.* Int J Hyperthermia, (2005) 21(5): p. 457-71.10.1080/02656730500088211.
- Greenwood, BN*; Foley, TE; Day, HE; Burhans, D; Brooks, L; Campeau, S; **Fleshner, M.** *Wheel Running Alters Serotonin (5-HT) Transporter, 5-HT1a, 5-HT1b, and Alpha 1b-Adrenergic Receptor mRNA in the Rat Raphe Nuclei.* Biol Psychiatry, (2005) 57(5): p. 559-68.10.1016/j.biopsych.2004.11.025.
- Fleshner, M.** *Translational Research Using In Vivo Measures of Primary Antibody Responses.* Brain Behav Immun, (2005) 19(4): p. 309-10.10.1016/j.bbi.2005.01.002.
- Fleshner, M.** *Physical Activity and Stress Resistance: Sympathetic Nervous System Adaptations Prevent Stress-Induced Immunosuppression.* Exerc Sport Sci Rev, (2005) 33(3): p. 120-6, <https://www.ncbi.nlm.nih.gov/pubmed/16006819>.
- Greenwood, BN*; Foley, TE; Burhans, D; Maier, SF; **Fleshner, M.** *The Consequences of Uncontrollable Stress Are Sensitive to Duration of Prior Wheel Running.* Brain Res, (2005) 1033(2): p. 164-78.10.1016/j.brainres.2004.11.037.
- Kennedy, SL*; Smith, TP; **Fleshner, M.** *Resting Cellular and Physiological Effects of Freewheel Running.* Med Sci Sports Exerc, (2005) 37(1): p. 79-83, <https://www.ncbi.nlm.nih.gov/pubmed/15632672>.
- Fleshner, M.** and M.L. Laudenslager, *Psychoneuroimmunology: Then and Now.* Behav Cogn Neurosci Rev, (2004) 3(2): p. 114-30.10.1177/1534582304269027.
- Johnston, IN; Milligan, ED; Wieseler-Frank, J; Frank, MG; Zapata, V; Campisi, J; Langer, S; Martin, D; Green, P; **Fleshner, M;** Leinwand, L; Maier, SF; Watkins, LR. *A Role for Proinflammatory Cytokines and Fractalkine in Analgesia, Tolerance, and Subsequent Pain Facilitation Induced by Chronic Intrathecal Morphine.* J Neurosci, (2004) 24(33): p. 7353-65.10.1523/JNEUROSCI.1850-04.2004.
- Holguin, A; O'Connor, KA; Biedenkapp, J; Campisi, J; Wieseler-Frank, J; Milligan, ED; Hansen, MK; Spataro, L; Maksimova, E; Bravmann, C; Martin, D; **Fleshner, M;** Maier, SF; Watkins, LR. *Hiv-1 Gp120 Stimulates Proinflammatory Cytokine-Mediated Pain Facilitation Via Activation of Nitric Oxide Synthase-I (Nnos).* Pain, (2004) 110(3): p. 517-30.10.1016/j.pain.2004.02.018.
- Smith, TP*; Kennedy, SL; **Fleshner, M.** *Influence of Age and Physical Activity on the Primary in Vivo Antibody and T Cell-Mediated Responses in Men.* J Appl Physiol (1985), (2004) 97(2): p. 491-8.10.1152/jappphysiol.01404.2003.
- Christou, EA; Jakobi, JM; Critchlow, A; **Fleshner, M;** Enoka, RM. *The 1- to 2-Hz Oscillations in Muscle Force Are Exacerbated by Stress, Especially in Older Adults.* J Appl Physiol, (2004) 97(1): p. 225-35.10.1152/jappphysiol.00066.2004.
- Fleshner, M;** Campisi, J; Amiri, L; Diamond, DM. *Cat Exposure Induces Both Intra- and Extracellular*



- Hsp72: The Role of Adrenal Hormones*. Psychoneuroendocrinology, (2004) 29(9): p. 1142-52.10.1016/j.psyneuen.2004.01.007.
- Day, HE; Greenwood, BN; Hammack, SE; Watkins, LR; **Fleshner, M**; Maier, SF; Campeau, S. *Differential Expression of 5ht-1a, Alpha 1b Adrenergic, Crf-R1, and Crf-R2 Receptor Mrna in Serotonergic, Gamma-Aminobutyric Acidergic, and Catecholaminergic Cells of the Rat Dorsal Raphe Nucleus*. J Comp Neurol, (2004) 474(3): p. 364-78.10.1002/cne.20138.
- Campisi, J*; Leem, TH; **Fleshner, M**. *Stress-Induced Extracellular Hsp72 Is a Functionally Significant Danger Signal to the Immune System*. Cell Stress Chaperones, (2003) 8(3): p. 272-86, <https://www.ncbi.nlm.nih.gov/pubmed/14984061>.
- Campisi, J*; Hansen, MK; O'Connor, KA; Biedenkapp, JC; Watkins, LR; Maier, SF; **Fleshner, M**. *Circulating Cytokines and Endotoxin Are Not Necessary for the Activation of the Sickness or Corticosterone Response Produced by Peripheral E. Coli Challenge*. J Appl Physiol (1985), (2003) 95(5): p. 1873-82.10.1152/jappphysiol.00371.2003.
- Gazda, LS*; Smith, T; Watkins, LR; Maier, SF; **Fleshner, M**. *Stressor Exposure Produces Long-Term Reductions in Antigen-Specific T and B Cell Responses*. Stress, (2003) 6(4): p. 259-67.10.1080/10253890310001594441.
- Fleshner, M**; Campisi, J; Johnson, JD. *Can Exercise Stress Facilitate Innate Immunity? A Functional Role for Stress-Induced Extracellular Hsp72*. Exerc Immunol Rev, (2003) 9: p. 6-24, <https://www.ncbi.nlm.nih.gov/pubmed/14686090>.
- Woodson, JC; Macintosh, D; **Fleshner, M**; Diamond, DM. *Emotion-Induced Amnesia in Rats: Working Memory-Specific Impairment, Corticosterone-Memory Correlation, and Fear Versus Arousal Effects on Memory*. Learn Mem, (2003) 10(5): p. 326-36.10.1101/lm.62903.
- Sorensen, B*; Streib, JE; Strand, M; Make, B; Giclas, PC; **Fleshner, M**; Jones, JF. *Complement Activation in a Model of Chronic Fatigue Syndrome*. J Allergy Clin Immunol, (2003) 112(2): p. 397-403, <https://www.ncbi.nlm.nih.gov/pubmed/12897748>.
- Greenwood, BN*; Kennedy, S; Smith, TP; Campeau, S; Day, HE; **Fleshner, M**. *Voluntary Freewheel Running Selectively Modulates Catecholamine Content in Peripheral Tissue and C-Fos Expression in the Central Sympathetic Circuit Following Exposure to Uncontrollable Stress in Rats*. Neuroscience, (2003) 120(1): p. 269-81, <https://www.ncbi.nlm.nih.gov/pubmed/12849759>.
- Greenwood, BN*; Foley, TE; Day, HE; Campisi, J; Hammack, SH; Campeau, S; Maier, SF; **Fleshner, M**. *Freewheel Running Prevents Learned Helplessness/Behavioral Depression: Role of Dorsal Raphe Serotonergic Neurons*. J Neurosci, (2003) 23(7): p. 2889-98, <https://www.ncbi.nlm.nih.gov/pubmed/12684476>.
- Elphick, GF*; Wieseler-Frank, J; Greenwood, BN; Campisi, J; **Fleshner, M**. *B-1 Cell (Cd5+/Cd11b+) Numbers and Nigm Levels Are Elevated in Physically Active Vs. Sedentary Rats*. J Appl Physiol (1985), (2003) 95(1): p. 199-206.10.1152/jappphysiol.01054.2002.
- Campisi, J*; Leem, TH; Greenwood, BN; Hansen, MK; Moraska, A; Higgins, K; Smith, TP; **Fleshner, M**. *Habitual Physical Activity Facilitates Stress-Induced Hsp72 Induction in Brain, Peripheral, and Immune Tissues*. Am J Physiol Regul Integr Comp Physiol, (2003) 284(2): p. R520-30.10.1152/ajpregu.00513.2002.



- Elphick, GF*; Greenwood, BN; Campisi, J; **Fleshner, M.** *Increased serum nIgM in voluntarily physically active rats: a potential role for B-1 cells.* J Appl Physiol (1985), (2003) 94(2): p. 660-7.10.1152/jappphysiol.00547.2002.
- Campisi, J.* and **Fleshner, M.**, *Role of Extracellular Hsp72 in Acute Stress-Induced Potentiation of Innate Immunity in Active Rats.* J Appl Physiol (1985), (2003) 94(1): p. 43-52.10.1152/jappphysiol.00681.2002.
- Campisi, J*; Leem, TH; **Fleshner, M.** *Acute Stress Decreases Inflammation at the Site of Infection. A Role for Nitric Oxide.* Physiol Behav, (2002) 77(2-3): p. 291-9, <https://www.ncbi.nlm.nih.gov/pubmed/12419405>.
- Fleshner, M;** Campisi, J; Deak, T; Greenwood, BN; Kintzel, JA; Leem, TH; Smith, TP; Sorensen, B. *Acute Stressor Exposure Facilitates Innate Immunity More in Physically Active Than in Sedentary Rats.* Am J Physiol Regul Integr Comp Physiol, (2002) 282(6): p. R1680-6.10.1152/ajpregu.00661.2001.
- Moraska, A*; Campisi, J; Nguyen, KT; Maier, SF; Watkins, LR; **Fleshner, M.** *Elevated Il-1beta Contributes to Antibody Suppression Produced by Stress.* J Appl Physiol (1985), (2002) 93(1): p. 207-15.10.1152/jappphysiol.01151.2001.
- Pugh, CR; **Fleshner, M.** Watkins, LR; Maier SF; Rudy, JW; *Converging evidence for an adverse effect of interleukin-1beta on learning and memory.* Neuroscience and Biobehavioral Reviews, 25 (2001) 29-41.
- Fleshner, M;** Deak, T; Nguyen, KT; Watkins, LR; Maier, SF. *Endogenous Glucocorticoids Play a Positive Regulatory Role in the Anti-Keyhole Limpet Hemocyanin in Vivo Antibody Response.* J Immunol, (2001) 166(6): p. 3813-9, <https://www.ncbi.nlm.nih.gov/pubmed/11238624>.
- Noteboom, JT; **Fleshner, M;** Enoka, RM. *Activation of the Arousal Response Can Impair Performance on a Simple Motor Task.* J Appl Physiol (1985), (2001) 91(2): p. 821-31.10.1152/jappl.2001.91.2.821.
- Moraska, A.* and **Fleshner, M.**, *Voluntary Physical Activity Prevents Stress-Induced Behavioral Depression and Anti-Klh Antibody Suppression.* Am J Physiol Regul Integr Comp Physiol, (2001) 281(2): p. R484-9.10.1152/ajpregu.2001.281.2.R484.
- Pugh, CR; **Fleshner, M;** Watkins, LR; Maier, SF; Rudy, JW. *The Immune System and Memory Consolidation: A Role for the Cytokine Il-1beta.* Neurosci Biobehav Rev, (2001) 25(1): p. 29-41, <https://www.ncbi.nlm.nih.gov/pubmed/11166076>.
- Fleshner, M.** *The immunity of the brain: the role of brain cytokines in physiology and pathophysiology.* Psychosomatic Medicine, (2001) 63, 511-515.
- Mazzeo, RS; Donovan, D; **Fleshner, M;** Butterfield, GE; Zamudio, S; Wolfel, EE; Moore, LG. *Interleukin-6 Response to Exercise and High-Altitude Exposure: Influence of Alpha-Adrenergic Blockade.* J Appl Physiol (1985), (2001) 91(5): p. 2143-9.10.1152/jappl.2001.91.5.2143.
- Moraska, A*; Deak, T; Spencer, RL; Roth, D; **Fleshner, M.** *Treadmill Running Produces Both Positive and Negative Physiological Adaptations in Sprague-Dawley Rats.* Am J Physiol Regul Integr Comp



Physiol, (2000) 279(4): p. R1321-9.10.1152/ajpregu.2000.279.4.R1321.

Hansen, MK; Nguyen, KT; **Fleshner, M**; Goehler, LE; Gaykema, RP; Maier, SF; Watkins, LR. *Effects of Vagotomy on Serum Endotoxin, Cytokines, and Corticosterone after Intraperitoneal Lipopolysaccharide*. Am J Physiol Regul Integr Comp Physiol, (2000) 278(2): p. R331-6.10.1152/ajpregu.2000.278.2.R331.

Fleshner, M. *Exercise and Neuroendocrine Regulation of Antibody Production: Protective Effect of Physical Activity on Stress-Induced Suppression of the Specific Antibody Response*. Int J Sports Med, (2000) 21 Suppl 1: p. S14-9, <https://www.ncbi.nlm.nih.gov/pubmed/10893019>.

Nguyen, KT; Deak, T; Will, MJ; Hansen, MK; Hunsaker, BN; **Fleshner, M**; Watkins, LR; Maier, SF. *Timecourse and Corticosterone Sensitivity of the Brain, Pituitary, and Serum Interleukin-1beta Protein Response to Acute Stress*. Brain Res, (2000) 859(2): p. 193-201, <https://www.ncbi.nlm.nih.gov/pubmed/10719064>.

Pecaut, MJ*; Simske, SJ; **Fleshner, M.** *Spaceflight Induces Changes in Splenocyte Subpopulations: Effectiveness of Ground-Based Models*. Am J Physiol Regul Integr Comp Physiol, (2000) 279(6): p. R2072-8.10.1152/ajpregu.2000.279.6.R2072.

Hansen, MK; Nguyen, KT; Goehler, LE; Gaykema, RP; **Fleshner, M**; Maier, SF; Watkins, LR. *Effects of Vagotomy on Lipopolysaccharide-Induced Brain Interleukin-1beta Protein in Rats*. Auton Neurosci, (2000) 85(1-3): p. 119-26, <https://www.ncbi.nlm.nih.gov/pubmed/11189018>.

Colagiovanni, DB; Suniga, MA; Frazier, JL; Edwards, CK, 3rd; **Fleshner, M**; McCay, JA; White, KL, Jr.; Shopp, GM. *Tnf-Alpha Blockade by a Dimeric Tnf Type I Receptor Molecule Selectively Inhibits Adaptive Immune Responses*. Immunopharmacol Immunotoxicol, (2000) 22(4): p. 627-51.10.3109/08923970009016429.

Deak, T; Nguyen, KT; **Fleshner, M**; Watkins, LR; Maier, SF. *Acute Stress May Facilitate Recovery from a Subcutaneous Bacterial Challenge*. Neuroimmunomodulation, (1999) 6(5): p. 344-54.10.1159/000026394.

Noble, EG; Moraska, A; Mazzeo, RS; Roth, DA; Olsson, MC; Moore, RL; **Fleshner, M.** *Differential Expression of Stress Proteins in Rat Myocardium after Free Wheel or Treadmill Run Training*. J Appl Physiol (1985), (1999) 86(5): p. 1696-701.10.1152/jappl.1999.86.5.1696.

Mesches, MH; **Fleshner, M**; Heman, KL; Rose, GM; Diamond, DM. *Exposing Rats to a Predator Blocks Primed Burst Potentiation in the Hippocampus in Vitro*. J Neurosci, (1999) 19(14): p. RC18, <https://www.ncbi.nlm.nih.gov/pubmed/10407060>.

Diamond, DM; **Fleshner, M.** *Constraints on the DHEAS-induced enhancement of hippocampal function: Non-Linear dose response functions and DHEAS-stress interactions*. In: The Biological Role of Dehydroepiandrosterone (DHEA) and Pregnenolone, Volume II, Walter de Gruyter, Berlin, (1999) 261-270.

Pugh, CR; Nguyen, KT; Gonyea, JL; **Fleshner, M**; Wakin, LR; Maier, SF; Rudy, JW. *Role of Interleukin-1 Beta in Impairment of Contextual Fear Conditioning Caused by Social Isolation*. Behav Brain Res, (1999) 106(1-2): p. 109-18, <https://www.ncbi.nlm.nih.gov/pubmed/10595426>.

Todd, P; Pecaut, MJ; **Fleshner, M.** *Combined Effects of Space Flight Factors and Radiation on Humans*.



- Mutat Res, (1999) 430(2): p. 211-9, <https://www.ncbi.nlm.nih.gov/pubmed/10631335>.
- Diamond, DM; **Fleshner, M**; Rose, GM. *The Enhancement of Hippocampal Primed Burst Potentiation by Dehydroepiandrosterone Sulfate (Dheas) Is Blocked by Psychological Stress*. Stress, (1999) 3(2): p. 107-21, <https://www.ncbi.nlm.nih.gov/pubmed/10938573>.
- Deak, T; Nguyen, KT; Cotter, CS; **Fleshner, M**; Watkins, LR; Maier, SF; Spencer, RL. *Long-Term Changes in Mineralocorticoid and Glucocorticoid Receptor Occupancy Following Exposure to an Acute Stressor*. Brain Res, (1999) 847(2): p. 211-20, <https://www.ncbi.nlm.nih.gov/pubmed/10575090>.
- Nguyen, KT; Deak, T; Owens, SM; Kohno, T; **Fleshner, M**; Watkins, LR; Maier, SF. *Exposure to Acute Stress Induces Brain Interleukin-1beta Protein in the Rat*. J Neurosci, (1998) 18(6): p. 2239-46, <https://www.ncbi.nlm.nih.gov/pubmed/9482808>.
- Maier, SF; Goehler, LE; **Fleshner, M**; Watkins, LR. *The Role of the Vagus Nerve in Cytokine-to-Brain Communication*. Ann N Y Acad Sci, (1998) 840: p. 289-300, <https://www.ncbi.nlm.nih.gov/pubmed/9629257>.
- Fleshner, M**; Goehler, LE; Schwartz, BA; McGorry, M; Martin, D; Maier, SF; Watkins, LR. *Thermogenic and Corticosterone Responses to Intravenous Cytokines (Il-1beta and Tnf-Alpha) Are Attenuated by Subdiaphragmatic Vagotomy*. J Neuroimmunol, (1998) 86(2): p. 134-41, <https://www.ncbi.nlm.nih.gov/pubmed/9663558>.
- Fleshner, M**; Nguyen, KT; Cotter, CS; Watkins, LR; Maier, SF. *Acute Stressor Exposure Both Suppresses Acquired Immunity and Potentiates Innate Immunity*. Am J Physiol, (1998) 275(3 Pt 2): p. R870-8, <https://www.ncbi.nlm.nih.gov/pubmed/9728086>.
- Gaykema, RP; Goehler, LE; Tilders, FJ; Bol, JG; McGorry, M; **Fleshner, M**; Maier, SF; Watkins, LR. *Bacterial Endotoxin Induces Fos Immunoreactivity in Primary Afferent Neurons of the Vagus Nerve*. Neuroimmunomodulation, (1998) 5(5): p. 234-40.10.1159/000026343.
- Maier, SF; **Fleshner, M**. Watkins, LR; *Neural, Endocrine and Immune Mechanisms of Stress-induced immunomodulation*. New Frontiers in Stress Research: Modulation of Brain Function, Harwood Academic Publishers, (1998) 75-186.
- Diamond, DM; Ingersoll, N; Branch, BJ; Mesches, MH; Coleman-Mesches, K; **Fleshner, M**. *Stress impairs cognitive and electrophysiological measures of hippocampal function*, In: New Frontiers in Stress Research: Modulation of Brain Function, Harwood Academic Publishers, (1998), 117-126.
- Milligan, ED; Nguyen, KT; Deak, T; Hinde, JL; **Fleshner, M**; Watkins, LR; Maier, SF. *The Long Term Acute Phase-Like Responses That Follow Acute Stressor Exposure Are Blocked by Alpha-Melanocyte Stimulating Hormone*. Brain Res, (1998) 810(1-2): p. 48-58, <https://www.ncbi.nlm.nih.gov/pubmed/9813238>.
- Pugh, CR; Kumagawa, K; **Fleshner, M**; Watkins, LR; Maier, SF; Rudy, JW. *Selective Effects of Peripheral Lipopolysaccharide Administration on Contextual and Auditory-Cue Fear Conditioning*. Brain Behav Immun, (1998) 12(3): p. 212-29.10.1006/brbi.1998.0524.
- Pugh, CR; **Fleshner, M**; Rudy, JW. *Type Ii Glucocorticoid Receptor Antagonists Impair Contextual but Not Auditory-Cue Fear Conditioning in Juvenile Rats*. Neurobiol Learn Mem, (1997) 67(1): p. 75-



9.10.1006/nlme.1996.3741.

- Fleshner, M**; Pugh, CR; Tremblay, D; Rudy, JW. *Dhea-S Selectively Impairs Contextual-Fear Conditioning: Support for the Antigluco corticoid Hypothesis*. Behav Neurosci, (1997) 111(3): p. 512-7, <https://www.ncbi.nlm.nih.gov/pubmed/9189266>.
- Pugh, CR; Tremblay, D; **Fleshner, M**; Rudy, JW. *A Selective Role for Corticosterone in Contextual-Fear Conditioning*. Behav Neurosci, (1997) 111(3): p. 503-11, <https://www.ncbi.nlm.nih.gov/pubmed/9189265>.
- Milligan, ED; McGorry, MM; **Fleshner, M**; Gaykema, RP; Goehler, LE; Watkins, LR; Maier, SF. *Subdiaphragmatic Vagotomy Does Not Prevent Fever Following Intracerebroventricular Prostaglandin E2: Further Evidence for the Importance of Vagal Afferents in Immune-to-Brain Communication*. Brain Res, (1997) 766(1-2): p. 240-3, <https://www.ncbi.nlm.nih.gov/pubmed/9359608>.
- Fleshner, M**; Silbert, L; Deak, T; Goehler, LE; Martin, D; Watkins, LR; Maier, SF. *Tnf-Alpha-Induced Corticosterone Elevation but Not Serum Protein or Corticosteroid Binding Globulin Reduction Is Vagally Mediated*. Brain Res Bull, (1997) 44(6): p. 701-6, <https://www.ncbi.nlm.nih.gov/pubmed/9421133>.
- Deak, T; Meriwether, JL; **Fleshner, M**; Spencer, RL; Abouhamze, A; Moldawer, LL; Grahn, RE; Watkins, LR; Maier, SF. *Evidence That Brief Stress May Induce the Acute Phase Response in Rats*. Am J Physiol, (1997) 273(6 Pt 2): p. R1998-2004, <https://www.ncbi.nlm.nih.gov/pubmed/9435654>.
- Brennan, FX, Jr.; **Fleshner, M**; Watkins, LR; Maier, SF. *Macrophage Stimulation Reduces the Cholesterol Levels of Stressed and Unstressed Rats*. Life Sci, (1996) 58(20): p. 1771-6, <https://www.ncbi.nlm.nih.gov/pubmed/8637401>.
- Fleshner, M**; Brennan, FX; Nguyen, K; Watkins, LR; Maier, SF. *Ru-486 Blocks Differentially Suppressive Effect of Stress on in Vivo Anti-Klh Immunoglobulin Response*. Am J Physiol, (1996) 271(5 Pt 2): p. R1344-52.10.1152/ajpregu.1996.271.5.R1344.
- Lockwood, LL; Silbert, LH; **Fleshner, M**; McNeal, C; Watkins, LR; Laudenslager, ML; Rice, KC; Weber, RJ; Maier, SF. *Morphine-Induced Alterations in Antibody Levels: Receptor and Immune Mechanisms*. J Pharmacol Exp Ther, (1996) 278(2): p. 689-96, <https://www.ncbi.nlm.nih.gov/pubmed/8768720>.
- Diamond, DM; Branch, BJ; **Fleshner, M**. *The Neurosteroid Dehydroepiandrosterone Sulfate (Dheas) Enhances Hippocampal Primed Burst, but Not Long-Term, Potentiation*. Neurosci Lett, (1996) 202(3): p. 204-8, <https://www.ncbi.nlm.nih.gov/pubmed/8848267>.
- Bennett, MC; Mlady, GW; **Fleshner, M**; Rose, GM. *Synergy between Chronic Corticosterone and Sodium Azide Treatments in Producing a Spatial Learning Deficit and Inhibiting Cytochrome Oxidase Activity*. Proc Natl Acad Sci U S A, (1996) 93(3): p. 1330-4, <https://www.ncbi.nlm.nih.gov/pubmed/8577764>.
- Diamond, DM; **Fleshner, M**; Ingersoll, N; Rose, GM. *Psychological Stress Impairs Spatial Working Memory: Relevance to Electrophysiological Studies of Hippocampal Function*. Behav Neurosci, (1996) 110(4): p. 661-72, <https://www.ncbi.nlm.nih.gov/pubmed/8864259>.



- Fleshner, M;** Deak, T; Spencer, RL; Laudenslager, ML; Watkins, LR; Maier, SF. *A Long-Term Increase in Basal Levels of Corticosterone and a Decrease in Corticosteroid-Binding Globulin after Acute Stressor Exposure.* *Endocrinology*, (1995) 136(12): p. 5336-42. [10.1210/endo.136.12.7588279](https://doi.org/10.1210/endo.136.12.7588279).
- Fleshner, M;** Bellgrau, D; Watkins, LR; Laudenslager, ML; Maier, SF. *Stress-Induced Reduction in the Rat Mixed Lymphocyte Reaction Is Due to Macrophages and Not to Changes in T Cell Phenotypes.* *J Neuroimmunol*, (1995) 56(1): p. 45-52, <https://www.ncbi.nlm.nih.gov/pubmed/7822481>.
- Fleshner, M;** Hermann, J; Lockwood, LL; Laudenslager, ML; Watkins, LR; Maier, SF. *Stressed Rats Fail to Expand the Cd45rc+Cd4+ (Th1-Like) T Cell Subset in Response to Klh: Possible Involvement of Ifn-Gamma.* *Brain Behav Immun*, (1995) 9(2): p. 101-12. [10.1006/brbi.1995.1011](https://doi.org/10.1006/brbi.1995.1011).
- Fleshner, M;** Goehler, LE; Hermann, J; Relton, JK; Maier, SF; Watkins, LR. *Interleukin-1 Beta Induced Corticosterone Elevation and Hypothalamic Ne Depletion Is Vagally Mediated.* *Brain Res Bull*, (1995) 37(6): p. 605-10, <https://www.ncbi.nlm.nih.gov/pubmed/7670884>.
- Diamond, DM; Branch, BJ; **Fleshner, M.** Rose, GM; *Effects of Dehydroepiandrosterone Sulfate (DHEAS) and stress on hippocampal electrophysiological plasticity,* *Annals of NYAS: DHEA and Aging*, 774 (1995) 304-307.
- Diamond, DM; **Fleshner, M;** Rose, GM. *Psychological Stress Repeatedly Blocks Hippocampal Primed Burst Potentiation in Behaving Rats.* *Behav Brain Res*, (1994) 62(1): p. 1-9, <https://www.ncbi.nlm.nih.gov/pubmed/7917027>.
- Laudenslager, ML; **Fleshner, M.** *Stress and Immunity: Of mice, monkeys, models and mechanisms.* The Handbook of Human Stress and Immunity, Academic Press, Glaser, R; Kiecolt-Glaser, J; Eds. (1994) 161-181.
- Maier, SF; Watkins, LR; **Fleshner, M.** *Psychoneuroimmunology. The Interface between Behavior, Brain, and Immunity.* *Am Psychol*, (1994) 49(12): p. 1004-17, <https://www.ncbi.nlm.nih.gov/pubmed/7818221>.
- Sutton, LC; **Fleshner, M;** Mazzeo, R; Maier, SF; Watkins, LR. *A Permissive Role of Corticosterone in an Opioid Form of Stress-Induced Analgesia: Blockade of Opiate Analgesia Is Not Due to Stress-Induced Hormone Release.* *Brain Res*, (1994) 663(1): p. 19-29, <https://www.ncbi.nlm.nih.gov/pubmed/7850467>.
- Lockwood, L.L., L.H. Silbert, **Fleshner, M.**, M.L. Laudenslager, L.R. Watkins, and S.F. Maier, *Morphine-induced decreases in in vivo antibody responses.* *Brain Behav Immun*, (1994) 8(1): p. 24-36.
- Thomas-Dobersten, DA; Butler-Simon, N; **Fleshner, M.** *Evaluation of a Weight Management Intervention Program in Adolescents with Insulin-Dependent Diabetes Mellitus.* *J Am Diet Assoc*, (1993) 93(5): p. 535-40, <https://www.ncbi.nlm.nih.gov/pubmed/8315162>.
- Grisel, JE; **Fleshner, M;** Watkins, LR; Maier, SF. *Opioid and Nonopioid Interactions in Two Forms of Stress-Induced Analgesia.* *Pharmacol Biochem Behav*, (1993) 45(1): p. 161-72, <https://www.ncbi.nlm.nih.gov/pubmed/8516354>.
- Fleshner, M;** Brohm, MM; Laudenslager, ML; Watkins, LR; Maier, SF. *Modulation of the in Vivo Antibody Response by a Benzodiazepine Inverse Agonist (Dmcm) Administered Centrally or*



- Peripherally*. *Physiol Behav*, (1993) 54(6): p. 1149-54,
<https://www.ncbi.nlm.nih.gov/pubmed/8295955>.
- Fleshner, M**; Watkins, LR; Lockwood, LL; Grahn, RE; Gerhardt, G; Meaney, MJ; Laudenslager, ML; Maier, SF. *Blockade of the Hypothalamic-Pituitary-Adrenal Response to Stress by Intraventricular Injection of Dexamethasone: A Method for Studying the Stress-Induced Peripheral Effects of Glucocorticoids*. *Psychoneuroendocrinology*, (1993) 18(4): p. 251-63,
<https://www.ncbi.nlm.nih.gov/pubmed/8391148>.
- Diamond, DM; Bennett, MC; **Fleshner, M**; Rose, GM. *Inverted-U Relationship between the Level of Peripheral Corticosterone and the Magnitude of Hippocampal Primed Burst Potentiation*. *Hippocampus*, (1992) 2(4): p. 421-30.10.1002/hipo.450020409.
- Fleshner, M**; Watkins, LR; Lockwood, LL; Bellgrau, D; Laudenslager, ML; Maier, SF. *Specific Changes in Lymphocyte Subpopulations: A Potential Mechanism for Stress-Induced Immunomodulation*. *J Neuroimmunol*, (1992) 41(2): p. 131-42,
<https://www.ncbi.nlm.nih.gov/pubmed/1469075>.
- Fleshner, M**; Watkins, LR; Redd, JM; Kruse, CA; Bellgrau, D. *A 9l Gliosarcoma Transplantation Model for Studying Adoptive Immunotherapy into the Brains of Conscious Rats*. *Cell Transplant*, (1992) 1(4): p. 307-12, <https://www.ncbi.nlm.nih.gov/pubmed/1344303>.
- Diamond, DM; Bennett, MC; **Fleshner, M**. Rose, GM; *Modulation of hippocampal primed burst potentiation by stress and corticosterone*. *Peripheral Signaling of the Brain: Role in Neural-Immune Interactions and Cognitive Function*, Fredrickson, RCA; Felton, DL; McGaugh, JI; Eds.; Hogrefe and Huber, Toronto (1991) 503-508.
- Barnes, CA; Forster, MJ; **Fleshner, M**; Ahanotu, EN; Laudenslager, ML; Mazzeo, RS; Maier, SF; Lal, H. *Exercise Does Not Modify Spatial Memory, Brain Autoimmunity, or Antibody Response in Aged F-344 Rats*. *Neurobiol Aging*, (1991) 12(1): p. 47-53, <https://www.ncbi.nlm.nih.gov/pubmed/2002883>.
- Bennett, CM; Diamond, DM; **Fleshner, M**. Rose, GM; *Serum corticosterone level predicts the magnitude of hippocampal primed burst potentiation in urethane-anesthetized rats*. *Psychobiology*, 19(4) (1991) 301-307.
- Engstrom, DA; Bennett, MC; Stevens, KE; Wilson, RL; Diamond, DM; **Fleshner, M**; Rose, GM. *Modulation of Hippocampal Primed Burst Potentiation by Anesthesia*. *Brain Res*, (1990) 521(1-2): p. 148-52, <https://www.ncbi.nlm.nih.gov/pubmed/2207654>.
- Watkins, LR; Thurston, CL; **Fleshner, M**. *Phenylephrine-Induced Antinociception: Investigations of Potential Neural and Endocrine Bases*. *Brain Res*, (1990) 528(2): p. 273-84,
<https://www.ncbi.nlm.nih.gov/pubmed/2271928>.
- Fleshner, M**; Laudenslager, ML; Simons, L; Maier, SF. *Reduced Serum Antibodies Associated with Social Defeat in Rats*. *Physiol Behav*, (1989) 45(6): p. 1183-7,
<https://www.ncbi.nlm.nih.gov/pubmed/2813542>.
- Diamond, DM; Bennett, MC; Engstrom, DA; **Fleshner, M**; Rose, GM. *Adrenalectomy Reduces the Threshold for Hippocampal Primed Burst Potentiation in the Anesthetized Rat*. *Brain Res*, (1989) 492(1-2): p. 356-60, <https://www.ncbi.nlm.nih.gov/pubmed/2752305>.



Laudenslager, ML; **Fleshner, M**; Hofstadter, P; Held, PE; Simons, L; Maier, SF. *Suppression of Specific Antibody Production by Inescapable Shock: Stability under Varying Conditions*. *Brain Behav Immun*, (1988) 2(2): p. 92-101, <https://www.ncbi.nlm.nih.gov/pubmed/3148338>.

VIII. PROFESSIONAL SEMINARS

i. International

* indicates the first author is/was a student or postdoctoral fellow supervised by Dr. Fleshner

Fleshner, M. Impacts of exercise and prebiotic dietary substrates on mind and body: The role of the gut microbiome/metabolome. **Invited Speaker**, 14th *International Society of Exercise Immunology Symposium*, Shanghai, China (2019).

Fleshner, M. Microbial modulatory dietary substrates promote stress robustness, **Invited Speaker**, 9th *Mind-Body Interface International Symposium*, Taichung, Taiwan (2019).

Fleshner, M. Integrative stress physiology: Brain, Behavior & Immunity, **Invited Speaker**, Norman Cousins Award, https://www.pnirs.org/society/society_awards.cfm, *Psychoneuroimmunology Research Society*, Berlin, Germany (2019).

Fleshner, M. Dietary prebiotic supplements prevent stress-evoked sleep disruptions, anxiety and gut microbial dysbiosis, **Invited Speaker**, 6th *Beneficial Microbes Conference*, Amsterdam, The Netherlands (2017).

Fleshner, M. Early Life Exercise Promotes Changes in Gut Microbial Ecology, Persistent Stress Robustness & Metabolic Health, **Invited Speaker**, *The International Society of Exercise Immunology*, Coimbra, Portugal (2017).

Fleshner, M. Acute Stressor Exposure Modulates Plasma Exosomal miRNA cargo and Hsp72 expression. **Invited Speaker**, *The First International Congress: DAMPs*, Guanajuato, Mexico (2016).

Fleshner, M. The Neurobiology and Physiology of Exercise-Induced Stress Robustness. **The 2016 Arthur C. Guyton Distinguished Lectureship Award**. *The Association of Chairs and Directors of Departments of Physiology*, Cabo San Lucas, Mexico (2016).

Fleshner, M. Gut Microbiome Promotes Stress Robustness, **Invited Speaker**, *International Society for Exercise Immunology*, Vienna, Austria (2015).

Fleshner, M. Exercise and stress robustness: Benefits for physical and mental health. **Invited Speaker**, *University of Adelaide*, Adelaide, Australia (2013).

Fleshner, M. A healthy mind in a healthy body: Impacts of exercise on stress robustness. **Presidential Symposium**, *International Society for Exercise Immunology*, Newcastle, Australia (2013).

Fleshner, M. Stress and Immunity. **Invited speaker**, *Corsi Residenziali Di Neuroimmunologia. Centro Congressi Giovanni XXIII*, Bergamo-Italy (2013).

Fleshner, M. Stress-evoked sterile inflammation is modulated by physical fitness. **Keynote speaker**, *1st Brazilian Symposium of Immunology and Sport*, Sao Paulo, Brazil (2013).

Fleshner, M. Exercise produces stress resistance: Benefits for mental and physical health. **Keynote speaker**, *International Society for Exercise Immunology*, Oxford, England (2011).



- Fleshner, M;** Maslanik, T; Tannura, K; Mahaffey, L; Bennison, L. The role of the gut microbiota in the acute stressor evoked sterile inflammatory response. **Invited speaker**, *International Society for Exercise Immunology*, Oxford, England (2011).
- Fleshner, M.** Exosome-associated extracellular heat shock protein 72 is released by stress and functions as a DAMP. *Psychoneuroimmunology Research Society*, Dublin, Ireland (2010).
- Fleshner, M.** Exercise and central autonomic regulation: Mechanisms for the protective effect of exercise on stress-induced immunosuppression. *International Society of Exercise Immunology*, Tübingen, Germany (2009).
- Fleshner, M.** Extracellular Hsp 72: A double edged sword for health. *Psychoneuroimmunology Research Society*, Arcachon, France (2007).
- Fleshner, M.** Extracellular Hsp 72: A double-edged sword for health. *International Cell Stress and Chaperone Society*, Budapest, Hungary (2007).
- Fleshner, M.** Elevated level of circulating cytokines and endotoxin are not necessary for the activation of the sickness or corticosterone responses produced by peripheral *E. coli* challenge. *Physiology and Pharmacology of Temperature Regulation*, Rhodes, Greece (2004).
- Fleshner, M.** Extracellular Hsp72 released by stress facilitates innate immunity: *In vivo and in vitro* support. *Psychoneuroimmunology Research Society*, Titisee, Germany (2004).
- Fleshner, M.** Hsps and the general stress response. *First International Congress on Stress Responses in Biology and Medicine*. Quebec City, Canada (2003).
- Fleshner, M.** Stress, heat shock proteins and innate immunity: “The danger signal hypothesis”. *International Society for Exercise Immunology*, Copenhagen, Denmark (2003).
- Elphick, GF*; **Fleshner, M.** B-1 cell depletion attenuates the enhanced *E.coli* clearance in physically active rats. *International Society for Exercise Immunology*, Copenhagen, Denmark (2003).
- Fleshner, M.** Leem, T; Campisi, J; Greenwood BN; The potential role of heat shock proteins in stress-induced modulation of innate and acquired immunity. *Psychoneuroimmunology Research Society*, Utrecht, Netherlands (2001).
- Fleshner, M.** Neuroendocrine regulation of the antibody response. *The International Society of Exercise and Immunology IV*, Rome, Italy (1999).
- Fleshner, M.** Leem, T; Kintzel, J; Moraska, A; Deak, T; Smith, TP; Physical activity facilitates bacterial inflammation resolution produced by stress. *The International Society of Exercise and Immunology IV*, Rome, Italy (1999).

ii. Domestic

* indicates the first author is/was a student or postdoctoral fellow supervised by Dr. Fleshner

- Fleshner, M.** Prebiotic Diet Modulates Fecal Microbiome/Metabolome and Facilitates Recovery from Sleep and Circadian Disruption in Rats. *Tri-Service Microbiome Consortium*, Boston, MA (2019) **Invited Speaker.**
- Fleshner, M.** Early Life Prebiotics, Probiotics, and a Stress Robust Phenotype. *American Academy of Child and Adolescent Psychiatry*, Chicago, IL (2019) **Invited Speaker.**



Fleshner, M. Exercise and Prebiotic Diet Modulates the Gut Microbiota and Promotes Stress Robustness. *Cell and Molecular Biology Fall Seminar Series, Colorado State University, Fort Collins, CO (2019) Invited Speaker.*

Fleshner, M. Prebiotics, Probiotics, and a Stress Robust Phenotype. *Center for Neuroscience, University of Colorado-Boulder, Colloquium (2019) Invited Speaker.*

Fleshner, M. Dietary Prebiotics Impact Gut Microbiome and Metabolome: A Successful Countermeasure for Improving Resilience to Sleep & Circadian Disruption, *Integrative Physiology, University of Colorado-Boulder, Departmental Colloquium (2018) Invited Speaker.*

Fleshner, M. Dietary prebiotics & stress resistance: Impacts on the brain, sleep, inflammation and the gut microbiome/metabolome, *Probiota Americas, Miami, Florida (2018) Invited Speaker.*

Fleshner, M. Inflammatory Homeostasis: A role for MAMPs, DAMPs and microRNA, *Experimental Biology, San Diego, CA (2018) Invited Speaker.*

Thompson RS^{*}; Bowers SJ; Gonzalez A; Vargas F; Wright KP Jr; Lowry CA; Vitaterna MH; Turek FW, Knight R; Dorrestein PC; **Fleshner M.** Gut Microbial Modulatory Diet Reduces the Impact of Chronic Circadian Disruption on Sleep and Facilitates Rhythm Realignment, *Society for Research on Biological Rhythms, Amelia Island, Florida (2018) Selected Speaker.*

Fleshner, M. Stress evoked sterile inflammation: A role for MAMPs, DAMPs and microRNA, *Colorado State University, Health and Exercise Science Spring Seminar Series, Fort Collins, CO (2018) Invited Speaker.*

Fleshner, M. Early life exercise promotes favorable changes in gut microbial ecology, persistent stress robustness, and metabolic health, *Duke University School of Medicine Interdisciplinary Symposium, Raleigh-Durham, North Carolina (2017) Invited Speaker.*

Fleshner, M. Inflammatory Homeostasis: A role for MAMPs, DAMPs and microRNA, *Integrative Physiology, University of Colorado-Boulder, Departmental Colloquium (2017) Invited Speaker.*

Fleshner, M. Early life exercise promotes favorable changes in gut microbial ecology, persistent stress robustness and metabolic health, *Department of Integrative Biology, University of Colorado-Denver, Fall Seminar Series (2017), Invited Speaker.*

Fleshner, M. The neurobiology and physiology of exercise-induced stress robustness. *ACSM: World Congress on the Basic Science of Exercise and the Brain, Denver CO (2017), Invited Speaker.*

Fleshner, M. Prebiotic diet modulates the impact of stress on REM sleep. *The Colorado Sleep and Circadian Research Symposium, The University of Colorado, Boulder, CO (2016), Invited Speaker.*

Fleshner, M. Danger signals, microRNA and the inflammasome: Stress-evoked sterile inflammation and its relevance in mood disorders. *American College of Neuropsychopharmacology, Hollywood, FL (2016), Invited Speaker.*

Fleshner, M. Exercise induces stress robustness across the lifespan: The role of the gut microbiota. *The Integrative Biology of Exercise, American Physiological Society, Phoenix, AZ (2016), Invited Speaker.*



- Fleshner, M.** Exercise induces stress robustness across the lifespan: The role of the gut microbiota. *Cousins Center Lectures in Psychoneuroimmunology (PNI) at UCLA School of Medicine*. Los Angeles, CA (2016), **Invited Speaker**.
- Fleshner, M.** Early life prebiotic diet promotes sleep and stress robustness. *Gordon Conference on Sleep*, Galveston, TX (2016), **Invited Speaker**.
- Fleshner, M.** Early life exercise and the gut microbiota: Long lasting impacts on brain, stress resistance, and metabolism. *Neurobiology of Learning and Memory, 40th Anniversary*. Park City, UT (2016).
- Fleshner, M.** Promoting Stress Robustness. Georgia State University, *Neuroscience Institute Distinguished Lecture Series*, Atlanta, GE (2015), **Invited Speaker**.
- Fleshner, M.** Stress, Exercise and Sleep. University of Colorado School of Medicine Anschutz, *Department of Neurology, Resident Sleep Seminar*, Denver, CO (2015).
- Fleshner, M.** Exercise promotes stress robustness: Modulation of brain serotonin neurocircuitry. University of Colorado Anschutz Medical Campus, *Integrated Physiology Graduate Program Seminar*, Denver, CO (2015).
- Fleshner, M.** Protecting our troops from damaging stress. *University of Northern Colorado School of Biological Sciences Symposium*, Greeley, CO (2015).
- Fleshner, M.** Acute stressor exposure modulates plasma exosomal miRNA and Hsp72 cargo. *Academic Health Research Seminars University of Minnesota School of Medicine*, Duluth, MN (2014).
- Fleshner, M.** Rhythm disruptions and stress sensitization. *The Colorado Sleep and Circadian Research Symposium*, The University of Colorado, Boulder, CO (2014).
- Fleshner, M.** Exercise promotes stress robustness. *The Society for Neuroscience* (Exercise, energy intake, and the brain, selected symposium). Washington, DC (2014).
- Fleshner, M.** Exercise and prebiotic modulation of the gut microbiome promotes stress robustness. *The Psychoneuroimmunology Research Society*, (Integrating the microbiome into PNI paradigm and Mind/Body science, selected symposium). Philadelphia, PA (2014).
- Fleshner, M.** Acute stressor exposure modulates plasma exosomal miRNA and Hsp72 cargo. *The Seventh International Symposium on Heat Shock Proteins in Biology and Medicine*. Washington, DC (2014).
- Fleshner, M.** Disruptions in body temperature rhythms predict stress sensitization. *The International Behavioral Neuroscience Society*, Las Vegas, NV (2014).
- Fleshner, M.** Mindful movement and movement of the minds. *The Diversity Summit*, University of Colorado at Boulder.
- Fleshner, M.** Exercise promotes stress robustness. *The American College of Neuropsychopharmacology*, Phoenix, AZ (2014) selected symposium.
- Fleshner, M.** Putting the ice on stress, aging and CNS trauma. *Winter Conference on Brain Research*, Steamboat, CO (2014).



- Fleshner, M.** Extracellular Hsp72 is a DAMP released by stress. *Experimental Biology*, Boston, MA (2013). https://www.webges.com/cslide/e02816c/public/play_video/19 (ACVP Symposium: Inside-Out- Extracellular Roles for Heat Shock Proteins)
- Fleshner, M.** Protecting our troops from damaging stress. *Center for Neuroscience seminar*, University of Colorado, Boulder, CO (2013).
- Fleshner, M.** Novel gene targets of exercise-induced stress resistance in the dorsal raphe nucleus. *Winter Conference on Brain Research*, Breckenridge, CO (2013).
- Fleshner, M.** Impact of physical activity on stress robustness, *Department of Physiology & Neurobiology*, Dartmouth, Lebanon NH (2013).
- Fleshner, M.** Exercise and stress “robustness”: Benefits for physical and mental health. *Department of Psychology and Neuroscience*, Duke University, Durham, NC (2012).
- Fleshner, M.** Protecting our troops from damaging stress. *IPHY seminar*, University of Colorado, Boulder, CO (2012).
- Fleshner, M.** Exercise and stress resistance and resilience: Benefits for mental and physical health. University of Vermont **Macmillan Symposium, Keynote Lecture** (includes webcast to local colleges and high schools). Burlington, VT (2012).
- Fleshner, M.** Stress, inflammasomes and sterile inflammation. **Presidential Symposium Lecture**, *Psychoneuroimmunology Research Society*, San Diego, CA (2012).
- Fleshner, M.** DAMPs, MAMPs, & the Inflammasome in Stress-Evoked Sterile Inflammatory Protein Responses. **Presidential Symposium Lecture**, *Society for Behavioral Neuroendocrinology*, Madison, WI (2012).
- Fleshner, M.** Exercise and stress resistance and resilience: Benefits for mental and physical health. *Biology Department Colloquium*, Kent State University, Kent, OH (2011).
- Fleshner, M.** Exercise and stress resistance and resilience. *School of Life Sciences Lecture Series*, Arizona State University, Tempe, AZ (2011).
- Fleshner, M.** Stress, DAMPs and Immunomodulation. *Society for Leukocyte Biology Meeting PNIRS Symposium*, Kansas City, MO (2011).
- Fleshner, M.** Extracellular Hsp72 is an endogenous DAMP released by stress. *Biological and Immunological Sciences Seminar*, Ohio State University, Columbus, OH (2011).
- Fleshner, M.** Stress & Immunity in Experimental Animal Models. *PNIRS Educational Short Course*, Chicago, IL (2011).
- Fleshner, M.** Endogenous Hsp72: Releasing signals, cellular sources & releasing pathways. *Graduate PNI Seminar*, University of Denver, Denver, CO (2010).
- Fleshner, M.** Enabling stress resistance with exercise. *Neuroscience Seminar*, University of Illinois, Champaign, IL (2010).



- Fleshner, M.** Exercise and stress resistance: From brain to behavior. *Winter Brain Conference*, Breckenridge, CO (2010).
- Fleshner, M.** Enabling stress resistance with controllable exercise: Affective consequences and 5HT mechanisms. *Neuroscience Colloquium*, Smith College, Northampton, MA (2010).
- Fleshner, M.** The stress buffering effects of exercise: Immune consequences & SNS mechanisms. *Biology Colloquium*, Smith College, Northampton, MA (2010).
- Fleshner, M.** The stress buffering effects of exercise. *The Neurobiology of Stress Workshop*, Session Chair, Boulder, CO (2010).
- Fleshner, M.** The stress buffering effects of exercise. *The Winter Brain Conference on the Neurobiology of Learning and Memory*, Park City, Utah (2009).
- Fleshner, M.** Endogenous alarm signals: Immune consequences, releasing signals, and cellular sources. *Integrated Biomedical Science Seminar Series*, Loma Linda, CA (2008).
- Fleshner, M.** Extracellular Hsp72: Releasing signals and cellular source. *Integrative Physiology seminar*, University of Colorado, Boulder, CO (2008).
- Fleshner, M.** Extracellular Hsp72: A double-edged sword for health. *Center for Neuroscience seminar*, University of Colorado, Boulder, CO (2008).
- Fleshner, M.** Exercise and stress resistance: Neural mechanisms and health consequences. *The Repole Lecture*, University of Vermont, Birmingham VT (2007).
- Fleshner, M.** Exercise and stress resistance: Neural mechanisms and health consequences. University of California-Irvine, Irvine, CA (2007).
- Fleshner, M.** Exercise and stress resistance: Neural mechanisms and health consequences. *Integrative Physiology seminar*, University of Colorado, Boulder, CO (2007).
- Fleshner, M.** Exercise and stress resistance: Neural mechanisms and immunological consequences. *Anatomy and Physiology seminar*, Kansas State University, Manhattan, KA (2006).
- Fleshner, M.** Extracellular Hsp 72: A double-edged sword for health. *Integrative Physiology seminar*, University of Colorado, Boulder, CO (2006).
- Fleshner, M.** The protective effect of physical activity on stress-induced immunosuppression: neuroendocrine mechanisms. *Department of Physiology and Neuroscience*, University of Colorado Health and Science Center, Denver, CO (2006).
- Fleshner, M.** Extracellular Hsp 72: A double edged sword for host defense. *Pediatrics seminar*, University of California-Irvine, Irvine, CA (2006).
- Fleshner, M.** Physical activity suppresses the negative effect of stress: A systems biology approach. *Health and Exercise Science seminar*, Colorado State University, Fort Collins, CO. (2006).
- Fleshner, M.** Physical activity and tyrosine supplementation-Two effective interventions that prevent stress-induced immunosuppression: Implications for aging. **Keynote Speaker**, *Seminar workshop of Center for Aging and the Life Course*, Purdue University, West Lafayette, IN (2005).
- Fleshner, M.** Sympathetic nervous system activation stimulates the release of heat shock protein 72 into the circulation: Potential immunological consequences. *NIH Biodefense workshop*, *Integrative*



Neural Immune Program. Washington, DC (2005).

Fleshner, M. Adaptations in 5HT systems produced by exercise prevents stress-induced affective dysregulation. *Winter Conference on Brain Research*, Winter Park, CO (2005).

Fleshner, M. Endogenous Hsp72 is released by catecholamines and may function as a “danger signal” for immunity. *American Association of Immunologists* (2005).

Fleshner, M. Physical activity reduces the negative effects of stress on behavior, neural, endocrine and immune responses. **Keynote Address**, *American College of Sports Medicine* (2005).

Fleshner, M. Exercise and Stress Resistance: A Systems Biology Approach. *Pennington Research Conference Series*, Baton Rouge, Louisiana. (2004).

Fleshner, M. The protective effect of physical activity on stress-induced immunosuppression: Neuroendocrine mechanisms. *Integrative Neuroscience Colloquium Series*, Marquette University, Milwaukee, WI (2004).

Fleshner, M. Exercise prevent s learned helplessness: The role of serotonin. *Susan Samueli Center for Complementary and Alternative Medicine*, College of Medicine, University of California-Irvine, Irvine, CA (2004).

Fleshner, M. Heat shock proteins and the stress response: Implications for immunity. *School of Medicine Basic Science Seminar Series*, Loma Linda University, Loma Linda, CA (2004).

Fleshner, M. Heat shock proteins and the stress response: Danger signals for immunity. *Immunology Seminar Program*, Department of Medicine, Ohio State University, Columbus, OH (2004).

Fleshner, M. The neurobiology of the stress resistant brain. *Integrative Physiology Colloquium series*. University of Colorado, Boulder CO (2004).

Fleshner, M. A sedentary lifestyle reduces stress resistance. *Department of Kinesiology*, University of Illinois, Urbana, IL (2003).

Fleshner, M. Possible mechanisms of activation on the innate immune system by non-immune stressors: “The danger signal” hypothesis. *Presidential symposium, Psychoneuroimmunology Research Society*, Ameila Island, Florida (2003).

Fleshner, M. Stress, inflammation and heat shock proteins. *American College of Sports Medicine, Featured session*, San Francisco, CA (2003).

Fleshner, M. Stress-induced extracellular HSP72 is a functionally significant "danger signal to the immune system”. *American Association of Immunologists and International Society for NeuroImmunoModulation (ISNIM), Guest symposium*. Denver, CO (2003).

Fleshner, M. Exercise prevents learned helplessness: The role of 5HT. *Neuroscience Seminar Series*, University of Colorado, Boulder CO (2003).

Fleshner, M. A sedentary lifestyle reduces stress-resistance. *Institute of Behavioral Science, Population and Health Seminar*, University of Colorado, Boulder CO (2003).

Fleshner, M. Physical Activity and Depression: Neural mechanisms. *Introduction to Neuroscience II*, University of Colorado, Boulder CO (2003).

Fleshner, M. The immune system and its relationship to pain. *Internal Medicine Review: Pueblo*



Association for Interest in Neuroscience and TMD Study, Pueblo, CO (2002).

Fleshner, M. The physiology of the stress response in sedentary and physically active organisms". *Rocky Mountain chapter of the American College of Sports Medicine*, Fort Collins, CO (2002)

Fleshner, M. The stress-susceptibility of a sedentary lifestyle. *University of Colorado Health Sciences Center, Center for Nutrition seminar*, Denver, CO (2002).

Fleshner, M. The stress susceptibility of a sedentary lifestyle: Brain neurocircuitry. *Department of Neuroscience Seminar Series*, University of Virginia (2001).

Fleshner, M. The immune system: A tutorial. *The Summer Institute for Psychoneuroimmunology Research II*, University of Washington (2000).

Fleshner, M. Stress-induced extracellular HSP72 is a functionally significant "danger signal" to the immune system. *Basic Science Conference, The Division of Medical Oncology*, University of Colorado Health Sciences Center, Denver, CO (2002).

Fleshner, M. Heat shock proteins and inflammation: The body's "danger signal", *American Association of Immunologists and PNIRS Guest symposium*, New Orleans, Louisiana (2002).

Fleshner, M. Campisi, J; Miller, JK; Kennedy, SL; Smith, TP; Physical activity reduced circulating and tissue cytokine and sympathetic responses to stress. *Psychoneuroimmunology Research Society*, Madison, Wisconsin (2002).

Fleshner, M. Leem, T; Campisi, J; Greenwood BN; The potential role of heat shock proteins in stress-induced modulation of innate and acquired immunity. *The International Society of Exercise Immunology*, Baltimore, MD (2001).

Maier, SF; Nguyen, KT; Watkins, LR; **Fleshner, M.** Acute stress suppresses the KLH-specific but not mitogenic (ConA) proliferative response. *Research Perspectives in Psychoneuroimmunology, VIII*, (1998).

Fleshner, M. Moraska, A; The protective effect of exercise on stress-induced suppression of the specific antibody response. *Research Perspectives in Psychoneuroimmunology, VIII*, (1998).

Fleshner, M. The interface between brain, behavior and immunity: Is stress always bad? *The 19th annual conference of the New York Neuropsychology Group and New York Academy of Science*, New York, NY (1998).

Fleshner, M. Stress, Exercise and Immunity. *The Summer Institute for Psychoneuroimmunology Research*, University of Washington, Seattle, WA (1998).

Moraska, A*; Nguyen, KT; Mazzeo, RM; Roth, DA; **Fleshner, M.** Voluntary exercise potentiates whereas forced exercise suppresses anti-KLH responses. *Research Perspectives in Psychoneuroimmunology, VII*. (1997).

Fleshner, M. Nguyen, KT; Effects of unweighting on innate and specific immunity. *Aerospace Gravitational and Space Biology XII*, Charlotte, NC (1996).

Fleshner, M. Watkins, LR; Laudenslager, ML; Maier, SF; A CD4+ T cell shift from Th1 to Th2: A mechanism of stress-induced reduction of the KLH-specific antibody response. *Research Perspectives in Psychoneuroimmunology, V*, (1994).

Fleshner, M. Stress-induced reduction in MLR is dependent on macrophages but not on changes in



phenotypes. *Research Perspectives in Psychoneuroimmunology, IV*, (1993).

Fleshner, M. Watkins, LR; Lockwood, LL; Bellgrau, D; Laudenslager, ML; Maier, SF; Stress-Induced Changes in CD4+ and CD8+ Lymphocytes. *NIMH Research Training Directors Meeting*, Bethesda, MD (1991).

iii. Administrative

Fleshner M. Ways to get your scholarly work off to a great start. *Faculty Fair, Office of the Vice Chancellor for Research*, Boulder, CO (2013).

Fleshner M. Seed grants, competitions, applications and awards. *Faculty Fair, Office of the Vice Chancellor for Research*, Boulder, CO (2012).

Fleshner M. Level 1 Research. *Postdoc Career Development Retreat*, Denver, CO (2013).

IX. SERVICE

i. Departmental

1998, 2001	Faculty Search Committee, member
2002, 2008, 2010	Faculty Search Committee, member
2005-2006	Faculty Search Committee, Chair
2003-2008	Graduate Admissions Committee
2003-2013	Future Hiring/Steering Committee
2005-2013	Strategic Planning Committee
2005	Grievance Committee (special appointment)
2005	Tenure and Promotion Committee (Pei-San Sei)
2006-2008	Identity Task Force Committee, Chair
2008	Tenure and Promotion Committee PEUC (Wright)
2009-2010	Tenure and Promotion Committee PEUC (Allen)
2010-2011	IPHY Student Board Lecture
2011	Tenure and Promotion Committee PEUC (Tsai, Chair)
2011	Program Review: Space and Infrastructure, Chair
2011	Awards Committee, Chair
2010-2013	Welfare Committee, Chair
2005-2013	Space Committee, Chair
2014	Tenure and Promotion Committee PUEC (Wright, Chair)
2015-2016	Search Committee, Joint IPHY/PSYCH, Chair
2015-present	Wilderness Place Space Committee
2017-present	IPHY Executive Committee
2019	Tenure and Promotion Committee PEUC (Jerry Stitzel, Teaching Evaluation)
2019	Master's Committee Member, Dillon Frisco
2019	Master's Committee Member, Dasha Cogswell

ii. University

1997	Dean's Master Plan Task Force
1997-2007	Institutional Animal Care & Use Committee (IACUC) Co-Chair
1998	Undergraduate Honor's Council
1999-2002	Neuroscience Ph.D. Steering/Curriculum Committee
2002-present	Neuroscience Ph.D. Admissions Committee
2004-2009	Integrative Physiology Graduate Admissions Committee
2005	McNair Program Summer Minority Research Opportunity Program
2006-2011	Biological Science Initiative Faculty Board



2007-2011	Executive Advisory Committee
2009-2011	East Campus Advisory Committee
2010	VC for Research Office IT Search Committee, Chair
2011	LEAP/Faculty Affairs Workshop “Management”
2011-2012	College of Arts and Sciences Dean’s Search Committee (40+ hrs)
2012	CV Workshop (Postdoctoral Association)
2012-2013	Vice Chancellor for Research: Research Review Board (2 hrs per month)
2012-2013	Office of Animal Research OLAW Assurance Task Force (3 hrs per wk)
2009-2013	Faculty Associate to the Vice Chancellor for Research
2010-2014	College of Arts and Sciences Personnel and Tenure Committee (20 hrs per mo)
2012-2014	Boulder Faculty Assembly Budget and Finance Committee (1 hr per wk)
2013-2016	Academic Affairs Budget Advisory Committee
2014-2016	Boulder Faculty Assembly Budget and Finance Committee (Chair, 1 hr per wk)
2014-2016	Boulder Faculty Assembly Executive Committee (1 hr per wk)
2014	Boulder Faculty Assembly Discrimination/Harassment Policy and Procedure
2015	Carlson Renovation and Re-purposing Committee
2016	Academic Review and Planning Advisory Committee (ARPC)
2016	Leeds External Personnel Actions Committee
2016	Base Budget Steering Committee
2016	BFA Research Awards Committee (chair)
2015-2017	Associate Vice Chancellor Advisory Committee (AVC)
2015-present	Radiation Safety Committee Co-Chair (2 hr per mo)
2016-present	College of Arts & Sciences Dean’s Budget Committee (2 hr per mo)
2017-present	Center for Research and Education Addressing Cannabis and Health (CU REACH) https://www.colorado.edu/center/reach/people
2019	University of Colorado ARPAC reviewer: Institute of Cognitive Science
2019	Dissertation Committee Member, Kyle Brown, Psychology & Neuroscience

iii. Professional

Journal Reviewer (selected list):

American Journal of Reproductive Immunology
American Journal of Physiology
Behavioral Brain Research
Biological Psychiatry
Brain, Behavior and Immunity
Brain Research
Behavioral Neuroscience
Cell Biochemistry and Function
Developmental Psychobiology
European Journal of Physiology
Exercise Science and Sport Reviews
Expert Reviews in Vaccines
Frontiers
International Journal of Behavioral Medicine
Journal of Applied Physiology
Journal of Immunology
Journal of Neuroscience
Journal of Neuroimmunology
Journal of Gerontology: Medical Sciences
Neuroscience
Neurosignals



Neurobiology of Aging
 Physiology and Behavior
 Pharmacology, Biochemistry, and Behavior
 PlosONE
 Psychopharmacology
 Psychosomatic Medicine
 Stress: The International Journal on the Biology of Stress
 Synapse

Journal Editor:

2002-2005	Assistant Editor: Exercise Science and Sport Reviews
2002-2007	Editorial Board: Journal of Applied Physiology
2011-2013	Section Editor: BioMedCentral: Physiology
2008-2014	Editorial Board: Frontiers in Neuroscience
2011-2016	Editorial Board: Brain, Behavior and Immunity
2017-2018	Special Issue Editor: Brain, Behavior and Immunity
2014-2019	Editorial Board: The Neurobiology of Stress

Grant Reviewer:

1999-2015	National Science Foundation (NSF)
1999-2015	Undergraduate Research Opportunities Program (UROP)
2000-2001	National Aeronautics and Space Administration (NASA)
2000	National Institutes of Health (NIH) ad hoc reviewer
2001	National Institutes of Health CSR (IFCN-2) ad hoc reviewer
2000-2001	National Aeronautics and Space Administration (NASA)
2003	National Institutes of Health: Special Emphasis Panel
2003	National Science Foundation Postdoctoral Fellowship review panel: Microbiology, Physiology, and Neuroscience section.
2004-2008	National Institutes of Health: Neurobiology of Motivated Behavior, regular member
2008	National Institutes of Health: Special Emphasis Panel
2008	Swiss National Science Foundation
2008	National Aeronautics and Space Administration
2010	Deutsche Forschungsgemeinschaft (DFG) in Regensburg, Germany
2010-2012	National Institutes of Health: College of CSR Reviewers
2010	Army Research Office
2010	Medical Research Council, United Kingdom
2011	National Science Foundation Postdoctoral Fellowship Review Panel: Microbiology and Cell Biology Section
2011	National Institutes of Health Study Section, NNRS, Baltimore, MD
2011	National Institutes of Health Study Section, APDA, San Francisco, CA (2011)
2012	National Institutes of Health Study Section, BBBP, Washington DC
2013	National Aeronautics and Space Administration (Immunology), Review, Washington DC (2013).
2013	National Science Foundation, Neural Systems Cluster Integrative Organismal Systems / BIO
2013	Inserm Institut National, Institut des sciences biologiques
2013	Netherlands Organization for Scientific Research
2015	National Institutes of Health: Neurobiology of Motivated Behavior, <i>ad hoc</i> .
2016	Knut and Alice Wallenberg Foundation, Stockholm, Sweden.



- 2016 National Institutes of Health Study Section Biobehavioral Regulation, Learning, and Ethology (BRLE), *ad hoc*, Washington DC
- 2017 Knut and Alice Wallenberg Foundation, Stockholm, Sweden.
- 2017 Crohn's and Colitis Foundation, New York, NY.
- 2017 NIH-National Center for Complementary and Integrative Health (NCCIH / NIH)
- 2018 NIH-Fellowship, Career Development, and Research Grant Programs *Ad hoc reviewer*.
- 2018 NIH-Biobehavioral Regulation, Learning and Ethology Panel (BRLE/NIH) *Ad hoc reviewer*.
- 2018-present Crohn's and Colitis Foundation, *Grant reviewer*
- 2017-present NIH-Somatosensory and Pain Systems (SPS), *Grant reviewer*
- 2019 NIH-Helping to End Addiction Long-term (HEAL), Special Emphasis Panel, *Selected reviewer*.
- 2019 NIH-Myalgic Encephalomyelitis /Chronic Fatigue Syndrome Special Emphasis Panel
- 2019 Japan Agency for Medical Research and Development (AMED) *Selected reviewer*.
- 2019 UCLA external evaluator for promotion to Professor

Professional Society:

- 1990-present Society for Neuroscience, Member
- 2000-present International Society for Exercise Immunology, Member
- 1995-present Psychoneuroimmunology Research Society, Member
- 2001-2010 American Association of Immunologist, Member
- 2003-2010 Cell Stress Society International, Member
- 1998-2001 Psychoneuroimmunology Research Society, Nomination Committee
- 2000 Psychoneuroimmunology Research Society, Session Chair
- 1999-2001 Psychoneuroimmunology Research Society, Advisory Committee
- 2001 International Society for Exercise Immunology-Session Chair
- 2001-2004 Psychoneuroimmunology Research Society, Scientific Council (elected position)
- 2001-present International Society for Exercise Immunology, Scientific Program committee
- 2003 International Society for Exercise Immunology, Session Chair
- 2002-2004 Psychoneuroimmunology Research Society, Scientific Program Committee
- 2003 Psychoneuroimmunology Research Society, Session Chair
- 2005 Psychoneuroimmunology Research Society, Co-Host, Annual Meeting Denver, CO
- 2004-2006 Psychoneuroimmunology Research Society-Officer Secretary/Treasurer (elected position)
- 2004 Psychoneuroimmunology Research Society, Scientific Program Committee
- 2003-2004 American Physiological Society: Human use of animals exercise design workshop
- 2005-2006 American Physiological Society: Animal Care and Experimentation Committee (ad hoc member)
- 2007-2011 American Physiological Society: Animal Care and Experimentation Committee (Regular member)
- 2008-2013 Psychoneuroimmunology Research Society-Scientific Program Committee
- 2009 Psychoneuroimmunology Research Society-Co-Host of Annual Meeting Breckenridge, CO
- 2011-2012 Psychoneuroimmunology Research Society-President (elected position)



- 2011-2013 International Society for Exercise Immunology (ISEI), President (elected position)
- 2012-2013 Psychoneuroimmunology Research Society, Election & Awards Committee, Chair
- 2016-2018 Industrial Hemp Research Foundation: Founding member of the board
- 2018-present CU-Research Education, and Application in Cannabinoids and Health: Founding member of the board.
- 2018-present Psychoneuroimmunology Research Society Finance Committee

Community Outreach:

- 1998-2000 Community Outreach High School Research Advisor
- 2002 Internal Medicine Review: Pueblo Association for Interest in Neuroscience and TMD Study
- 2005-2015 High School Outreach Program. Annual group lab visits and presentations to students from inner city Denver High Schools
- 2011 Boulder Country Day Science Fair Judge (8 hrs)
- 2011 Medical Advance Community Lecture (Thornton, CO, 4 hrs)
- 2011-2015 Promoting Athletic Performance Recovery and Stress Resistance (PAPRR) Development Board (+4 hrs)
- 2013 CU at the Library Outreach, "Exercise & stress robustness: Benefits for mental physical health" (+5 hrs)
- 2015 CAPS (Counseling & Psychological Services) at CU, "Exercise Promotes Stress Robustness"
- 2015 CAPS (Counseling & Psychological Services) at CU, "Exercise and Prebiotic Diet Promotes Stress Robustness"
- 2012-present CU Wizards, "Immunity in Health & Disease: The Army Within" (+12 hrs per show/per year)
- 2016-present Globe Immune IACUC Member, Meeting Quarterly
- 2017-present Colorado Center for Animal Pain Management IACUC Co-Chair
- 2019 Cannabis and Psychedelics Symposium, University of Colorado-Wolf Law
- 2020

X. SELECTED MEDIA RELATIONS: Featured scientist

- Fleshner, M.** MSNBC, November 29, 2006, "Can stress actually be good for you?"
- Fleshner, M.** Psychology Today, August 10, 2006, "A case for double edged optimism."
- Fleshner M;** "O" The Oprah magazine, January 2007, "Why it's so hard to change yourself".
- Fleshner, M.** Body and Soul, November 2008, "Stay healthy this season."
- Fleshner, M.** US World & News Report, June 2008, "Relax! Stress can be good for you."
- Fleshner, M.** PBS TV Special, November 2009, "The Science of Healing".



Fleshner, M. Fitness, September 2010, “Stop stress for good.”

Fleshner, M. *Doctor Radio*, Sirius Radio, September 5, 2014, “Nutrition, Health and Fitness with Samantha Heller”.

Fleshner, M. *Early life exercise and the gut microbiota*. January 1st 2016, Channel 7 News, 5pm, 6pm, and 10pm. <https://shar.es/16gvDZ>.

Fleshner, M. *Could your workout impact your gut health? Yes and here’s why*. Vogue, March 25, 2016. <http://www.vogue.com/13420406/gut-health-microbiome-good-bacteria-exercise-new-studies-research/>

Fleshner, M. Prebiotics in early life may boost sleep and daytime rhythms, 2016. [http://www.nutraingredients-usa.com/Research/Prebiotics-in-early-life-may-boost-sleep-and-daytime-rhythms Study?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright](http://www.nutraingredients-usa.com/Research/Prebiotics-in-early-life-may-boost-sleep-and-daytime-rhythms-Study?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright)

Calmer Waters, *The Caregiver’s Journey through Alzheimer’s and Dementia*, by Barbara Cohn. Blue River Press, Indianapolis, IN. (2016). Contributing Author, “Exercise and Stress Robustness: Benefits for Mental and Physical Health” pp 173-177.

Fleshner, M. live healthy: Sleep-Stress Connection. Shape, Sept 2017, pg. 114. <https://shape.com>.

XI. TEACHING

i. Graduate Seminars/Courses

Courses are each a semester in duration (3 hrs lecture/ contact per week) at the University of Colorado at Boulder, unless otherwise indicated.

2007-present	IPHY 5600 Graduate Immunology	25 students/class
2006-2013	IPHY 6830 Professional Skills, 2 lectures per year	20 students/class
2002, 2003, 2006		
2013, 2016	IPHY 5100 Colloquium	25 students/class
2003-2011	ARSC 5110 Neuroscience II, 1 lecture per year	25 students/class
1998-1999	IPHY 6010 Exercise Immunology	20
	students/class	
1996	Behavioral Neuroscience	25 students/class
1994	Stress and Immunity	15 students/class

ii. Undergraduate Seminars/Courses

Courses are one semester in duration (3 hrs lecture/ contact per week) at the University of Colorado at Boulder, unless otherwise indicated.

2020	IPHY 2010 Health Professional: RAP	20 students/class
2007-present	IPHY 4600 Immunology	100-200 students/class
2006	IPHY Student Board Lecture	15 students/class
2005-2006	IPHY 3600 Immunology	125 students/class
2003-2004	IPHY 4770 Mind-Body Health	75 students/class
1998-2001, 2004	IPHY 4660 Critical Thinking: Exercise Immunology	30 students/class
2002	IPHY 4750 Psychological Kinesiology	75 students/class
2001	IPHY 4100 Colloquium	30 students/class
1993, 1996	Behavioral Neuroscience, Dept of Psychology	35 students/class
1993, 1996	Introductory Psychology, U of Colorado-Denver	200 students/class



1995	BioPsychology, Dept of Psychology	45 students/class
1994	Behavioral Neuroscience, Un of Colorado-Denver	30 students/class
1993, 1994	Drugs and Behavior, U of CO-Denver	40 students/class
1992	Intro Psychology, Front Range Community College	40 students/class
1991	Physiological Psychology, University of Denver	20 students/class

iii. Training Grant Faculty Advisor

2020-present	PI: Karoly, Hollis NIH K23 Scientific Advisor
2018-present	PI: Lindheimer, Jacob NIH Career Development Award: GRANT12478366 Research Health Scientist William S. Middleton Veterans Memorial Hospital Honorary Fellow UW-Madison Department of Kinesiology Title: “Acute exercise tolerance among Veterans with Gulf War Illness”

iv. Supervised Trainees (Primary Mentor)

Date / Student name / Research topic

Graduate Students: Past MS Students

1997-1998	Jen Kintzel, “Exercise, stress and inflammation”, MS
1997-1998	Taro Smith, “Exercise, stress, and hormones”, MS
1998-1999	Ted Leem, “Stress and inflammation”, MS
1997-1998	Bristol Sorensen, “CFS and exercise”, MS
1998-1999	Gwen Elphick, “Exercise, stress and antibody”, MS
1999-2000	Jay Campisi, “Stress and inflammation”, MS
1999-2000	Jill Miller, “Exercise, stress and cytokines”, MS
1999-2000	Kim Hansen, “Exercise and aging”, MS
1999-2001	Danielle Stinchfield, “Exercise and Parkinson’s”, MS
1999-2001	Ben Greenwood, “Exercise, stress and c-Fos”, MS
2002-2003	Julianne West, “Microbiology of inflammation”, MS
2001-2003	Karianne Higgins, “Age and intracellular HSPs”, MS
2001-2003	Molly Nickerson, “Physical activity and brain cytokines”, MS
2004-2006	Kyle Kirby, “Stress and the DRN”, MS
2003-2006	Craig Sharkey, “Stress and Inflammation” MS
2010-2011	Arman Serebrakian, BA/MS, “ADR signaling of adipose cytokines”, MS thesis
2010-2012	Brianne Loughridge, MS, “Gene array analyses of DRN”, MS advisor
2011-2012	Justin Hellwinkel, MS, “Behavioral Consequences of Stress and Exercise on Fear Conditioning”, MS
2011-2013	Stuart Cox, “Beta3 ADR signaling of IL1beta in adipose.” BA/MS
2011-2013	Katie Spence, “Exercise and brain plasticity”, BA/MS
2012-2014	Madeline Paton, “Stress, Nutrition and Sterile Inflammation” BA/MA
2012-2014	Jon Herrera, “The role of dopamine circuitry in the reward of exercise”, MS
2015-2017	Camille Crane, MS, “Exosomal protein expression and miRNA cargo
2015-2017	Donald Borchert, MS, “Exercise and prebiotics produce synergic effect of the gut microbiome.
2016-2017	Rebecca Hall, “The Second Brain: The Impact of Intestinal Microbiota on Stress-Induced Behavioral Depression”, MS
2016-2018	Rachel Roller, “Oral Phytochemical and Sterile Inflammation”, MS
2016-2018	Michelle Gaffney, “Prebiotic diet and Cognitive Performance”, MS



Graduate Students: Past MS/PhD Students

1997-1999	Michael Pecaut, "Spaceflight and immunity", PhD advisor
<u>Current Position:</u>	Associate Professor, Dept of Radiation Medicine/Division of Radiobiology, Loma Linda University
1998-2001	Albert Moraska, "Exercise, stress and antibody", PhD advisor
<u>Current Position:</u>	Professional Research Associate, UCHSC
1999-2003	Gwen Elphick, "nIgM and exercise", PhD advisor
<u>Current Position:</u>	Research Fellow, Brown Medical School
2000-2003	Jay Campisi, "Stress, Hsp and Inflammation", MS and PhD advisor
<u>Current Position:</u>	Associate Professor and Chair, Dept of Biology, Regis University
1998-2004	Taro Smith, "Aging and physical activity: Implications for human immune function and health", PhD advisor, Product Development
<u>Current Position:</u>	
1999-2005	Sarah Kennedy, "Exercise, stress and catecholamines", PhD advisor
<u>Current Position:</u>	Medical Science Liaison, Immunology, UCB Pharmaceuticals
2001-2005	Ben Greenwood, "Neurocircuitry of stress", PhD advisor
<u>Current Position:</u>	Assistant Professor, Psychology, University of Colorado at Denver
2001-2006	Molly Nickerson, "A role for estrogen in the expression of heat shock protein 72", PhD advisor, Translational Medical Scientist at Mitsubishi Tanabe Pharma
<u>Current Position:</u>	
2002-2009	Teresa Foley, "The neurobiology of exercise", MS advisor, PhD advisor.
<u>Current Position:</u>	Science Education Fellow & Senior Instructor, IPHY, University of Colorado
2007-2012	Paul Strong, "Neurobiology, stress and exercise", MS advisor, PhD advisor
<u>Current Position:</u>	Scientific Communications Manager, Medical Affairs, Spectranetics Inc.
2007-2012	Tom Maslanik, "Stress-induced sterile inflammatory responses" MS/PhD
<u>Current Position:</u>	Product Manager, Novus Biologicals
2008-2012	Kristin Speaker, "The effects of habitual exercise and fasting on stress-evoked cytokine expression in non-obese white adipose tissue", PhD
<u>Current Position:</u>	Postdoctoral Fellow & Transformational Weight Loss Coach, Anschutz Health and Wellness Center, Denver, CO
2006-2013	Robert Thompson, "Biotelemetric analyses of stress physiology: The impact of stressor chronicity, stressor controllability and exercise" MS/PhD
<u>Current Position:</u>	Postdoctoral Fellow, Department of Integrative Physiology
2007-2013	Lida Beninson, "The emerging role of exosomes in stress physiology" MS/PhD
<u>Current Position:</u>	National Academy of Sciences, Program Officer, Washington, DC.
2012-2016	Aggie Mika, "The long-term impact of exercise across the lifespan", PhD advisor
<u>Current Position:</u>	Medical Associate, Health Care Consultancy Group, NY, NY.



Postdoctoral Fellows: Past Fellows

2002-2007	John D. Johnson, PhD, Postdoctoral Fellow Mentor,
<u>Current Position:</u>	Associate Professor, Neuroscience Dept, Kent State University
2006-2007	Josh Friedman, PhD, Postdoctoral Fellow Mentor.
<u>Current Position:</u>	Medical Liaison, Immunology, Roche Pharmaceuticals
2007-2008	Isaac Bernstein-Hanley, PhD, Postdoctoral Fellow Mentor,
<u>Current Position:</u>	Harvard School of Medicine, Research Liaison
2005-2008	Sarah Kennedy, PhD advisor/Postdoctoral Fellow Mentor.
<u>Current Position:</u>	Medical Science Liaison, Immunology, UCB Pharmaceuticals
2005-2014	Ben Greenwood, Postdoctoral Fellow Mentor
<u>Current Position:</u>	Assistant Professor, University of Colorado at Denver
2011-2013	Peter Clark, PhD, Postdoctoral Mentor
<u>Current Position:</u>	Assistant Professor, Iowa State University
2013-2014	Lida Beninson, Postdoctoral Mentor
<u>Current Position:</u>	National Academy of Sciences, Program Officer, Washington, DC.
2016-2018	Aggie Mika, Postdoctoral Mentor
<u>Current Position:</u>	Medical Associate, Health Care Consultancy Group, NY, NY.

Predocctoral Level Trainees: Current

2020-present	Shelby Hopkins, Graduate Student Mentor
2019-present	Trey Jouard, Graduate Student Mentor

Senior Postdoctoral Level Trainees: Current

2018-present	Heidi Grabenstatter, Postdoc/Research Associate Advisor
2013-present	Robert Thompson, Postdoctoral Advisor

Junior Faculty Supervised: Past and Present

2010-present	Monique LeBourgeois, PhD-Associate Professor, IPHY
2004-present	Marissa Ehringer, PhD-Associate Professor, IPHY & The Institute of Behavioral Genetics
2003-2015	Kenneth Wright, PhD-Professor, IPHY & The Center for Neuroscience

Undergraduate Student Researchers Supervised: Past and Present

1998	Karianne Higgins, "Tissue catecholamines", Hughes Undergraduate Research Assistant Program (URAP)
1998	Ted Leem, "Bacterial inflammation", Honor's student
1999	Mary Nickerson, "Brain <i>c-fos</i> activity", Undergraduate Research Opportunity Program (UROP)
1999	Jason McCarl, "Total immunoglobulin", UROP



2000	Kate Robinson, "Stress and catecholamines", Independent study
2000	Kristine Thompson, "Celiac ganglion <i>cfos</i> ", UROP
2000	Deric McIntosh, "Autonomic brain nuclei and <i>cfos</i> ", UROP
2001	Heather Crump, "Stress and inflammation", UROP
2001	Silvie Kilworth, "Stress and innate immunity", Independent study
2001	Danielle Frey, "Cytokines and aging", Independent study
2001	Julianna West, "Cell Localization of Intracellular HSP", UROP
2001	Alexander Tran, "Splenic Sympathetic Content", URAP
2001	Stephanie Cho, "Extracellular HSP and inflammation", URAP
2001	Lisa Umphrey, "Exercise and brain <i>cfos</i> ", URAP
2001	Teresa Foley, "nIgM and Exercise", URAP
2001	Deric McIntosh, "Neural basis of frustration", Independent study
2002-2003	Daniel Burhans, "Exercise and BNST", UROP, Work study
2002-2003	Melissa Hippley, "nIgM and Exercise", Independent study/URAP
2002-2003	Leah Brooks, "Neurochemistry of exercise", Independent study
2002	Karen Tal Oren, "Exercise and aging", Independent study
2002	Probin Shrestha, Volunteer medical aid - Kanti Children's Hospital Nepal, Independent study
2002	Lindsay Levkoff, "Exercise and nIgM", URAP
2002	Peter Bekker, "Aging and the antibody response", Volunteer
2002	Heather Crump, "Brain responses to bacteria and prior stress", UROP
2003	Brittany Shock, "Stress and splenic NE", URAP
2003	Katherine Hooley, "E. coli and brain IL1", URAP
2003	Craig Sharkey, "Stress and bacterial inflammation", URAP
2003	Carla Amat, "5HT1A and exercise", Independent study
2003	Lisa Malloy, "SERT and stress", Independent study
2004	James Lish, "BK vascular leaking and Hsp72", Independent study
2004	Jeff Kimes, "Hsp72 in brain and spleen", Independent study
2004	Ashley Eyre, "Stress and brain Hsp72", Independent study
2005	Garth Huberty, "EAE and neuroinflammatory pain", Independent study
2005	Robert Thompson, "Neural mechanism of the protective effects of exercise on stress-induced affective dysregulation", Independent study
2005-2006	Paul Strong, UROP, Independent study
2005-2007	Kristen Hetzler, "Heat shock proteins and stress", Independent study
2005-2007	Hugo (Trey) Hanson, "IL1 and the brain", Work study
2006	Valerie Cortez, SMART student, "NE and brain IL1"
2006-2007	Sarah Naguse, UROP
2006	Delsa Phillips, Independent study sponsor for Global Service Corp
2006-2008	Janelle Posey, "Brain Hsps", NIMH minority undergraduate trainee
2008	Lydia Urrutia, "Brain and 5HT", UROP
2006-2009	Sam Bowers, "Bacteria, brain and stress", High School Student Worker
2008-2009	Bradley Frazier, "Stress, 5HT and behavior", UROP
2008-2009	Brianne Loughridge, "Stress, 5HT and behavior", UROP
2008-2009	Tony Le, "Exercise and Motivation", Independent study
2008-2009	Katharine Strelitz, "Stress, 5HT and behavior", Independent study
2008-2009	Julia Rennick, "Stress and vascular cytokines", Independent study
2009-2011	Arman Serebrakian, "Stress & Adipose", Independent study
2009-2011	Danielle Crevling, HHMI, Independent study, "Stress, 5HT and behavior"
2009-2011	Justin Hellwinkel, "Stress, 5HT and behavior", Independent study
2010	Sierra Wohlman, "Stress and immunity", Independent study
2010-2011	Wendy Craig, "Stress and cardiovascular adaptations", Independent study



2010-2012	Katie Spence, "Stress, 5HT and behavior", Independent study
2010-2012	Lucas Macaffey, "Stress and Immunity", Independent study, UROP
2010-2012	Kate Tannura, "Stress and immunity" Independent study, UROP
2010-2012	Noaura Sadaoui, Work study, NIH HHMI, "Gene array analyses of DRN"
2010-2012	Stewart Cox, Independent study
2011	Phillip Adams, "Gene array analyses of DRN", Work study
2011	Charlie Bowers, High School Student Worker
2011	Leslie Blacksheer, "Stress, fat and cytokines", Volunteer
2011-present	Jonathan Herra, "Stress, fat and cytokines", Independent study
2011-2012	Jodie Rigali, "Stress, 5HT and behavior", Independent study
2011-2012	Michael Murphy, "Hsp72 and releasing signals", Independent study, BURST applicant
2011-2012	Abigail Hills, Independent study
2011	Brittany Sak, Internship
2011	Taylor Schmidt, Internship
2012-2014	Parsa Ghasem Independent study, Honor's Thesis (HHMI awardee)
2012-2014	Samantha Engel Independent study (Honor's student)
2013-2014	Courtney Bouchet, Independent study, HHMI applicant, Honor's Thesis
2013-2014	Roxie Christ, Independent study (UROP awardee)
2013-2014	Michelle Keag, Independent study (HHMI fellow)
2013-2014	Tyler Wieman, Independent study (BURST awardee)
2013-2014	Erika Sisneros (HHMI fellow)
2013-2014	Haley Manchester (BURST awardee)
2013-2014	Preston Bunker (HHMI awardee)
2013-2014	Sara McConnell (UROP awardee)
2013-2014	Tyler Woodworth (UROP, Independent Study)
2014	James Needle (RA)
2014	Nicco Baumann (Independent Study)
2013-2016	Kristina Hulen (HHMI awardee RA)
2013-2015	Donald Borchert (HHMI fellow, Independent Study)
2013-2016	Nicole Rumian (Independent Study, HHMI Awardee)
2014-2015	Mira Guha (Monarch High School, Science Research Seminar Program)
2014-2017	Alex Martinez (RA)
2014-2016	Michelle Gaffney (BURST Awardee & HHMI Awardee)
2014-2016	Rachel Roller (BURST Awardee & HHMI Awardee, Honors Awardee)
2015-2017	Kevin O'Connor (BURST Awardee)
2016-2017	Monica Patten (BUST Awardee)
2016-2017	Shelby Hopkins (BURST Awardee, BSI Awardee, RA)
2016-2018	Brooke Bower (BSI Awardee, Honors Awardee)
2016-2018	Leah Ramey (BSI Awardee)
2016-2019	Tel Kelley (Work Study, BSI Awardee)
2017-2019	Trey Jouard (Independent Study, Honors)
2019-2020	Hash Brown (Independent Study)
2019-present	Abbey Marye (Honors)
2019-present	Jonathan Noe (Independent Study, UROP)
2020-present	Sean A. Pierce (UROP)
2020-present	Zach Horan (Volunteer)
2020-present	Perry Hayman (Volunteer)
2020-present	Sarah.Bellatti (Volunteer)