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New VA Merit Grant Awarded to Dr. Beverley Greenwood-Van Meerveld

Dr. Beverley Greenwood-Van Meerveld, received renewal of her VA Merit grant with a score of 0.6% focusing on understanding the basic mechanisms that underlie anxiety and abnormal pain. Chronic pain is a very common symptom experienced by veterans returning from military conflicts. Previously, her team reported that the emotional brain communicates with the gastrointestinal (GI) tract to amplify visceral pain signals. In longitudinal studies, she found that neuroplasticity within the central nucleus of the amygdala (CeA) plays a pivotal role in stress-induced chronic pain. Dr. Greenwood-Van Meerveld’s was the first to discover that stress-induced chronic pain was abolished by tissue specific knockdown of glucocorticoid receptors (GR) or mineralocorticoid receptors (MR) in the CeA. Conversely, in a stress-naïve rat targeted knockdown of either GR or MR within the CeA increased corticotropin-releasing hormone (CRH) expression and induced colonic hypersensitivity. Furthermore, her team was the first to provide compelling evidence to show a central epigenetic regulation in males that strongly support modulation of the CeA as a potential therapeutic locus for pain. Despite the knowledge that the CeA plays a pivotal role in chronic stress induced pain, three important questions still remain to be answered 1) What are the molecular mechanisms within the CeA responsible for the chronicity of pain? 2) Do sexually dimorphic differences in the CeA explain why females are more susceptible to stress-induced visceral pain? 3) What interventional approaches can be employed that target the CeA to reverse chronic pain in veterans? To answer these questions, her latest grant proposes

Test the hypothesis that sexually dimorphic epigenetic dysregulation in the CeA underlies gene expression changes mediating the persistent effects of stress on visceral nociceptive processing.

Test the hypothesis that alterations in the expression of corticosteroid receptors and CRH expression within the CeA produced by chronic stress are reversed by environmental enrichment (EE).

Investigate whether epigenetic mechanisms in the CeA underlie the effects of environmental enrichment (EE) on chronic stress-induced visceral pain.
New paper highlight (Dr. Beverley Greenwood-Van Meerveld lab)

Optogenetics as a Novel tool to Study Abdominal Pain

Dr. Beverley Greenwood-Van Meerveld and her colleague Dr. Anthony Johnson, published a paper in the American Journal of Physiology entitled *Visceral hypersensitivity induced by optogenetic activation of the amygdala in conscious rats*. Their findings reveal that optogenetic technology can be employed as a tool to advance understanding of the brain-gut axis. Using adeno-viral-mediated expression of opsins, which were activated by laser light and targeted by fiber optic cannulae, they examined central nociceptive circuits mediating visceral pain in a freely moving rat. Photoactivation of amygdala fibers in the stria terminalis with channelrhodopsin induced colonic hypersensitivity, whereas inhibition of the same fibers with halorhodopsin did not alter colonic sensitivity.
Dr. Beverley Greenwood-Van Meerveld, served as the editor of a book entitled Gastrointestinal Pharmacology that aims to connect ideas and concepts about GI disorders with the search for novel therapeutics. The latest metrics show that the book has been downloaded 36,900 times since being published late in 2017 and has received 63 citations.

Welcoming Dr. Jacob Friedman as Professor of Physiology

Dr. Jacob “Jed” Friedman, Ph.D., the New Director of the Harold Hamm Diabetes Center, will join the Department of Physiology at OUHSC as a Professor of Physiology on Jan. 2nd, 2019.

Dr. Friedman joins us from the University of Colorado School of Medicine, where he served as the Director of the Colorado Program in Nutrition and Healthy Development and Director of the NIH Nutrition and Obesity Research Center laboratories for cellular and molecular metabolism.
Awardees of the Harold Hamm Diabetes Symposium (Poster Awards)

Rui Cheng, Ph.D.
Postdoctoral Fellow
in Dr. Jay Ma’s lab

Ashley Martin
Doctoral candidate
in Dr. Dean Myers’s lab

Welcoming new students to our Department!

Emily Smith
Masters student
ANNUAL HOLIDAY PARTY

Department of Physiology
Christmas Party – December 11, 2018
Department of Physiology
Christmas Party –
December 11, 2018
MERRY CHRISTMAS & HAPPY NEW YEAR

May this Christmas be bright and cheerful and may the New Year begin on a prosperous note.
About the newsletter

We hope you have enjoyed reading the OUHSC Physiology newsletter. This publication is intended to share with everyone the latest events and developments within the Department. We welcome articles, thoughts and suggestions for our future issues. Please do so by emailing Dr. Hui-Ying Lim (hlim@ouhsc.edu).

A shout-out to Yue Li for providing all the lovely party photos for the newsletter!