THE INTERNATIONAL STRESS AND BEHAVIOR SOCIETY (ISBS)

Program and Proceedings

14th International Regional (North America) ISBS Neuroscience and Biological Psychiatry "Stress and Behavior" Conference

Miami Beach, FL, USA
June 22-23, 2018

CELEBRATING 21 YEARS TO ISBS CONFERENCES!

Promoting stress neuroscience research since 1997

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ZEBRAFISH NEUROSCIENCE RESEARCH CONSORTIUM

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Day 1. Friday, June 22, 2018

Celebration Room, Holiday Inn Miami Beach-Oceanfront, 4333 Collins Ave, Miami Beach, FL

10.00-17.00 REGISTRATION

MORNING SESSION

11.00-11.25 WELCOMING ADDRESS: CELEBRATING 21 YEARS OF ISBS "STRESS AND BEHAVIOR" CONFERENCES. INDUCTION OF NEW ISBS FELLOWS

11.25-11.50 ISBS FELLOW TALK: IDENTIFYING DIFFERENCES IN EXPECTATION, VERSUS THE PRESENCE, OF SHOCK: LEARNING DIFFERENCES OBSERVED IN PARTIAL REINFORCEMENT IN BEHAVIORALLY INHIBITED *WISTAR-KYOTO* RATS COMPARED TO *SPRAGUE DAWLEY* RATS. DP Miller and RJ Servatius, Carthage College, Kenosha, WI, Stress and Motivated Behavior Institute, Newark, NJ, Central New York Research Corporation, Syracuse, NY, USA

11.50-12.15 EXTENDING THE LEARNING DIATHESIS MODEL OF ANXIETY DISORDERS BEYOND BEHAVIORAL INHIBITION TO DISTRESSED TYPE D PERSONALITY. MT Allen, University of Northern Colorado, Greeley, CO, Stress and Motivated Behavior Institute, Newark, NJ, Central New York Research Corporation, Syracuse, NY, USA

12.15-17.00 ZUKOWSKA SYMPOSIUM ON STRESS NEUROSCIENCE
Chairs: DP Miller, MT Allen (USA)

12.15-12.20 INTRODUCTION: PROFESSOR ZOFIA ZUKOWSKA

12.20-12.35 GENETIC VARIANTS IN CCSER1 GENE ARE ASSOCIATED WITH ALZHEIMER'S DISEASE. C Xu, C Barrett, J Abshier, C Weary, S Nair and KS Wang, Department of Health and Biomedical Sciences, College of Health Affairs, University of Texas Rio Grande Valley, Brownsville, TX, USA

12.35-12.50 ANXIETY-RELATED AND DEPRESSIVE-LIKE BEHAVIOURS FOLLOWING INFLAMMATORY COLITIS INVOLVES NEURO-IMMUNE INTERACTIONS. VM Gadotti, Z Zhang, S M'Dahoma, G Andonegui, P Kubes and G Zamponi, Department of Physiology and Pharmacology, Hotchkiss Brain Institute and Alberta Children's Hospital Research Institute, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada

12.50-14.00 LUNCH BREAK (FREE TIME)

AFTERNOON SESSION

14.00-14.20 VALIDATION OF ANALYTICAL PLATFORMS TO STUDY CALCIUM BINDING PROTEIN, SPERMATID-ASSOCIATED 1 (CABS1) AS A BIOMARKER OF PSYCHOLOGICAL STRESS IN HUMAN SALIVA. EA Reyes-Serratos, M Marcet-Palacios, T Ritz and AD Befus, University of Alberta, Southern Methodist University, Alberta, Canada

14.20-14.35 ASSOCIATION BETWEEN EARLY LIFE STRESS AND CORTISOL REACTIVITY IN ADULT MALES. LM Baker and C Hansen, Keiser University Graduate School, Fort Lauderdale, Florida, USA

14.35-14.50 THE RELATIONSHIP BETWEEN POST-STROKE DEPRESSION SUBTYPES AND STROKE LESION LOCATION IN ADULT FEMALES. CA Henry, LM Baker, C Hansen and LB Daniels, Keiser University Graduate School, Fort Lauderdale, Florida, USA

14.50-15.10 **GOING WITH THE FLOW: ASSOCIATIONS BETWEEN PARTICIPATION IN GROUP-EXERCISE CLASSES AND OVERALL WELLBEING IN ACTIVE MATURE ADULTS.** J Danilowski and C Hansen, Keiser University Graduate School, Fort Lauderdale, Florida, USA

15.10-15.40 **COFFEE BREAK**

15.40-16.00 **ADULT ATTACHMENT STYLE'S ASSOCIATION WITH A SEROTONIN TRANSPORTER GENE AND ITS POTENTIAL EFFECT ON MENTAL HEALTH.** K Schroeder, V Bajnath and S Clark, Nova Southeastern University, FL, USA

16.00-16.20 **CURRENT VIEWS AND MANAGEMENT PREFERENCES OF PRE-PROCEDURAL ANXIETY ACCORDING TO INTERVENTIONAL RADIOLOGISTS.** A Pendi, D Baron, A Ali, K Pendi, A Anavim, A Grewal, A Melkonian and R Ter-Oganesyan, University of California Irvine, University of Southern California, University of California San Diego, University of California Riverside, California Northstate University, Western University of the Health Sciences, CA, USA

16.20-16.40 **EFFECTS OF CHRONIC STRESS EXPERIENCE ON ZEBRAFISH BRAIN TRANSCRIPTOME**. V Huang, A Butler, F Lubin, Department of Neurobiology, University of Alabama at Birmingham, USA

16.40-17.00 **ACUTE EFFECTS OF DELIRIANT HALLUCINOGENS ATROPINE AND SCOPOLAMINE ON ZEBRAFISH.** AD Volgin, OA Yakovlev, KA Demin, DA Meshalkina, PA Alekseeva, TG Amstislavskaya and AV Kalueff, Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg, Institute of Experimental Medicine, Almazov National Medical Research Centre, Military Medical Academy, Russian Center for Radiology and Surgical Technologies, St. Petersburg, Ural Federal University, Ekaterinburg, Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia; School of Pharmacy, Southwest University, Chongqing, China; The International Zebrafish Neuroscience Research Consortium (ZNRC), ZENEREI Research Center, Slidell, LA, USA

Day 2. Saturday, June 23, 2018

Celebration Room, Holiday Inn Miami Beach-Oceanfront, 4333 Collins Ave, Miami Beach, FL

09.30-12.00 REGISTRATION

10.00-12.45 LAPIN SYMPOSIUM ON BIOLOGICAL PSYCHIATRY
Chair: AV Kalueff (China)

10.00-10.10 INTRODUCTION: PROFESSOR IZYASLAV P LAPIN

10.10-10.30 ISBS OUTREACH: NEUROSCIENCE MEETS ARTS: AN ARTIST'S PERSPECTIVE (AUDIOVISUAL). D Raytchev, Daniela Raytchev Art, London, UK

10.30-11.30 ISBS LECTURE: NEW DEVELOPMENTS IN ZEBRAFISH MODELS IN TRANSLATIONAL NEUROSCIENCE RESEARCH. AV Kalueff, Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg, Ural Federal University, Ekaterinburg, Russia; School of Pharmaceutical Sciences, Southwest University, Chongqing, China; ZENEREI Research Center, Slidell, LA, USA

11.30-12.45 COFFEE BREAK AND MODERATED POSTER SESSION:

DEPRESSION AND DEPRESSION STIGMA IN CZECH UNIVERSITY STUDENTS: PRELIMINARY FINDINGS OF A CROSS-SECTIONAL STUDY. A Pendi, E Voslarova, K Pendi, D Baron, University of California Irvine, CA, USA; University of Veterinary and Pharmaceutical Sciences, Czech Republic; University of California Riverside, University of Southern California, CA, USA

DEPRESSION AND DEPRESSION STIGMA IN EGYPTIAN UNIVERSITY STUDENTS: PRELIMINARY FINDINGS OF A CROSS-SECTIONAL STUDY. A Pendi, J Ashraf, S Abou El Magd, M Khalil, S Gohar, K Wolitzky-Taylor, K Pendi, R Abdel Maksoud, N Adel, D Baron, University of California Irvine, CA, USA; American University of the Caribbean, St. Martin; Cairo University, Egypt; University of Oslo, Norway; University of California Los Angeles, University of California Riverside, University of Southern California, CA, USA

CURRENT PREFERENCES FOR PRE-OPERATIVE ANXIETY MANAGEMENT ACCORDING TO SPINE SURGEONS: A SURVEY STUDY. A Pendi, J Wang, F Acosta, R Movahedi, D Safani, A Shahbazi, A Melkonian, G Gucev, University of California Irvine, University of Southern California, Western University of the Health Sciences, CA, USA

METFORMIN INCREASE ANXIETY LEVEL IN RATS WITH METABOLIC SYNDROME INDUCED IN CHILDHOOD AGE. T Karatsuba, O Tkachenko, G Shayakhmetova, I Blazchuk and V Kovalenko, Toxicology Department, Institute of Pharmacology and Toxicology NAMSU, Kiev, Ukraine

BIOELECTRIC ACTIVITY OF THE BRAIN DURING EXPERIENCE OF THE VITAL STRESS. NK Apraksina, TV Avaliani and SG Tsikunov, Institute of Experimental Medicine, St. Petersburg, Russia

GENDER, PSYCHOLOGICAL STRESS AND ALCOHOL CONSUMPTION. A NATIONAL SURVEY IN ECUADORIAN UNIVERSITIES. P Ruisoto, SL Vaca, Israel Contador, IES Abroad Salamanca, University of Salamanca, Salamanca, Spain; Técnica Particular de Loja, Loja (UTPL), Ecuador

EFFECTS OF CHRONIC MAFEDINE EXPOSURE IN ZEBRAFISH. YI Sysoev, DA Meshalkina, DS Petrov, SV Okovitiy, PE Musienko and AV Kalueff, Saint-Petersburg State Chemical Pharmaceutical University; Institute of Translational Biomedicine (ITBM), St Petersburg State University, St Petersburg, Russia

OPTIMAL EXPERIENCES (FLOW) ARE CORRELATED WITH A MORE EFFICIENT ANTI-INFLAMMATORY CHOLINERGIC EFFERENT VAGUS NERVE PATHWAY. M Agnoletti, Verona University, Verona, Italy

12.45-13.00 CLOSING

ABSTRACTS

Day 1. Friday, June 22, 2018

Celebration Room, Holiday Inn Miami Beach-Oceanfront, 4333 Collins Ave, Miami Beach, FL

MORNING SESSION

CELEBRATING 21 YEARS OF ISBS "STRESS AND BEHAVIOR" CONFERENCES

INDUCTION OF NEW ISBS FELLOWS

Professor Daniel Miller has a Ph.D. in psychology and neural science from Indiana University, an M.P.A. in health care administration from Long Island University, and a B.A. in psychology from Westminster College (New Wilmington, Pennsylvania). His current research interests involve the function of the cerebellum and amygdala in stress vulnerable rats using the signaled leverpress avoidance task. In collaboration with Dr. Richard Servatius of the Stress and Motivated Behavior Institute at the Office of Veterans Affairs in Syracuse, New York, Prof. Miller and his students are using selective lesion and temporary innactivation techniques to study how discreet areas of the cerebellum and amygdala contribute to facilitated avoidance learning in stress vulnerable rats compared to outbred controls. His human research interests include activation of stress response via enhanced CO2 administration, acquisition of escape and avoidance behavior during CO2 administration, and temperament and sex difference vulnerabilities in stress and anxiety disorders. At Indiana University, Prof. Miller was a graduate student of Dr. Joseph Steinmetz from 1989 to 1994. While in the Steinmetz lab, his research focused on the function of the hippocampus in rabbit eyeblink conditioning and the neural substrates of appetitive and aversive signaled lever-pressing in rats.

Professor Todd Allen earned his BA is Psychology from North Carolina State University. While a doctoral student, Dr. Allen received a NSF pre-doctoral fellowship to study the effects of nitric oxide on eyeblink conditioning. After completing his Ph.D. in Neural Science and Psychology at Indiana University, Dr. Allen served as a post-doctoral researcher at the Center for Molecular and Behavioral Neuroscience (CMBN) at Rutgers University-Newark. This work involved lesion and drug studies that explored the predictions of computational models of the cerebellum and hippocampus. He has been at the University of Northern Colorado since 2003 and was recently promoted to full professor. Dr. Allen's training in behavioral neuroscience included both animal and human studies of learning and memory. His current research involves testing a learning diathesis model of PTSD in collaboration with colleagues at the Stress and Motivated Behavior Institute (SMBI) and the Dept. of Veterans' Affairs (VA) in New York and New Jersey. This theory puts forth that personality influences associative learning which in turn increases vulnerability to the development of PTSD. This work has involved classical eyeblink conditioning in humans as well as computer tasks based on the rules of classical and operant conditioning as well as category learning. One theme evident in all of these studies is the role of uncertainty plays in enhancing associative learning in individuals at risk for PTSD and anxiety disorders. Outside of academia, Dr. Allen is an avid scuba diver who has been diving all over the world and enjoys the opportunity to dive in the Florida Keys when attending the ISBS meeting in Miami Beach.

ISBS FELLOW TALK: IDENTIFYING DIFFERENCES IN EXPECTATION, VERSUS THE PRESENCE, OF SHOCK: LEARNING DIFFERENCES OBSERVED IN PARTIAL REINFORCEMENT IN BEHAVIORALLY INHIBITED *WISTAR-KYOTO* RATS COMPARED TO *SPRAGUE DAWLEY* RATS. DP Miller and RJ Servatius, Carthage College, Kenosha, WI, Stress and Motivated Behavior Institute, Newark, NJ, Central New York Research Corporation, Syracuse, NY, USA

INTRODUCTION: The behaviorally inhibited Wistar-Kyoto (WKY) strain has been studied extensively as a model for anxiety vulnerability. WKY rats acquire signaled lever-press avoidance more rapidly and they are resistant to extinguishing the avoidance response when compared to Sprague Dawley (SD) rats (e.g., Servatius et al, 2008). Recently it was demonstrated that learning in behaviorally inhibited humans was less affected by partial reinforcement during Pavlovian eye blink conditioning (Allen et al., 2014). In the present study we compared avoidance acquisition in female WKY versus female SD rats receiving either 100% paired tone-shock trails, or 50% paired trials with 50% tone only trials. **METHODS:** A total of 24 female WKY rats and 24 female SD rats received 20 1 min warning signal trials per session for 9 sessions. An avoidance leverpress during the warning signal resulted in no shock delivery. Failure to make an avoidance response resulted in 500 ms pulses of footshock which were terminated upon leverpress (and hence an escape response) or 20 shock pulses, whichever came first. One half of the rats received 100% paired tone-shock trials, and one half received 50% paired trials with 50% tone only trials. Avoidance responses were recorded. **RESULTS AND DISCUSSION:** Both WKY groups showed higher levels of acquisition compared to either SD group. In fact, SD rats receiving 50% paired trials adopted a strategy of waiting for the first shock pulse and making an escape rather than an avoidance. In contrast, WKY rats receiving 50% paired trials showed high levels of avoidance, even on trials that were consistently not paired with shock (e.g., the first trial of each session). Further, both WKY groups made significantly more non-reinforced lever presses during an intertrial interval safety period. Our results suggest that female WKY rats are driven by the expectation of shock, even when the shock is inconsistent. In contrast, female SD rats are driven by the presence of shock, especially when the shock is inconsistent. These different approaches in expectation of and response to intermittent aversive events could explain why we see enhanced associative learning in human populations that show increased risk for the development of anxiety and stress disorders. **RESEARCH SUPPORT:** Carthage College and the Central New York Research Corporation.

ISBS FELLOW TALK: EXTENDING THE LEARNING DIATHESIS MODEL OF ANXIETY DISORDERS BEYOND BEHAVIORAL INHIBITION TO DISTRESSED TYPE D PERSONALITY. MT Allen, University of Northern Colorado, Greeley, CO, Stress and Motivated Behavior Institute, Newark, NJ, Central New York Research Corporation, Syracuse, NY, USA

INTRODUCTION: Recent work has focused on a learning diathesis model in which the temperamental factor of behavioral inhibition (BI) influences associative learning and in turn increases the risk for the development of anxiety disorders. BI is defined as a temperamental tendency to withdraw from or avoid novel social and non-social situations and is considered a vulnerability factor for the development PTSD. We will review the relationship of BI to PTSD, provide evidence that BI individuals exhibit enhanced learning, and extend this work beyond BI to include distressed (Type D) personality which involves social inhibition as well as negative affect. Based on prior work, we hypothesized that SI (which is similar to BI), but not NA (which is similar to depression), would enhance eyeblink conditioning. **METHODS:** Sixty participants completed personality inventories including the Adult Measure of Behavioral Inhibition (AMBI) and Type D distressed (DS-14) scale. All participants received 60 acquisition trials with a 500 ms, 1000 Hz, tone CS and a50 ms, 5 psi corneal air puff US. Training consisted of either 100% CS-US paired trials or 50% US alone trials intermixed with CS-US trials. Eyeblink responses were measured via silver chloride EMG electrodes. **RESULTS AND DISCUSSION:** BI was significantly related to Type D personality, SI and NA. However, BI and SI, but not NA, individuals exhibited enhanced eyeblink conditioning as compared to non- inhibited individuals ($p < 0.05$). Personality factors now including social inhibition as well as behavioral inhibition can be used to differentiate fast and slow learners supporting the utility of eyeblink conditioning as a behavioral measure for assessing anxiety vulnerability. The differential findings of BI/SI and NA should be used to extend work on anxiety vulnerability to include depression which has a high rate of co-morbidity with anxiety disorders. **RESEARCH SUPPORT:** the University of Northern Colorado, the Stress and Motivated Behavior Institute, and the Central New York Research Corporation.

ZUKOWSKA SYMPOSIUM ON STRESS NEUROSCIENCE
Chairs: DP Miller, MT Allen (USA)

INTRODUCTION: PROFESSOR ZOFIA ZUKOWSKA

Prof. ZOFIA M. ZUKOWSKA (1949-2012) received her M.D. and Ph.D., trained in cardiovascular medicine at the Warsaw Medical Academy (Poland). She pursued post-doctoral training at the NIH, working with such renowned scientists as Irwin I. Kopin, Scientific Director of NINDS, and Julie Axelrod, a Nobel Laureate. During this research period, her interest in stress and neuropeptides became galvanized. For the 25 years, she was a professor (and, later Chair) of the Department of Physiology and Biophysics at Georgetown University, before moving to the University of Minnesota as the Director of Stress Physiology Center. Her research examined how stress affects cardiovascular and metabolic health and diseases, and the role of peptides, in particular neuropeptide Y (NPY), a sympathetic neurotransmitter and stress mediator. She was the first to determine that NPY mediates stress-induced prolonged vasoconstriction and vascular mitogenic and pro-atherosclerotic effects (via Y1 receptors) and potent angiogenic actions (via Y2 receptors), establishing the role of NPY in ischemia, retinopathy, tumors and obesity. Professor Zukowska (or Zosia, as she was known and admired by many) was a good friend and a strong supporter of the ISBS, serving as a regular plenary speaker at our conferences. Her scientific vision, extraordinary creativity, kindness to colleagues, and the talent to be daring, continue to inspire all her ISBS colleagues and their research. This regular ISBS symposium continues Zofia's scientific legacy in the field of biological psychiatry of stress.

GENETIC VARIANTS IN CCSER1 GENE ARE ASSOCIATED WITH ALZHEIMER'S DISEASE. C Xu, C Barrett, J Abshier, C Weary, S Nair and KS Wang, Department of Health and Biomedical Sciences, College of Health Affairs, University of Texas Rio Grande Valley, Brownsville, TX, USA
INTRODUCTION: Alzheimer's disease (AD) makes up 60-80% of dementia cases and is a progressive disease. An estimated 5.4 million people in the United States are affected. The etiology of AD is multi-factorial, including gene-gene interactions and gene-environment interaction based on family and twin studies. Many Genome Wide Association Studies have been conducted and serval genes are suggested for AD. Among these genes, CCSER1, coiled-coil serine rich protein 1 on 4q22.1, is our interested. Several studies of variants in 4q showed association with AD phenotypes. **METHODS:** Therefore, we examined if CCSER1 genetic variants have significant association with risk and age at onset (AAO) of AD in the GenADA-case control data (791 cases and 782 controls with 1,588 single-nucleotide polymorphisms (SNPs) within the CCSER1 gene available) and the NIA-LOAD family study data (1266 cases and 1279 controls with 3007 SNPs available). **RESULTS AND DISCUSSION:** Results of the single marker- and haplotype analyses from both GenADA and NIA-LOAD samples demonstrate several AD associated SNPs within the CCSER1 gene. The top AD-associated SNP was rs10031148 (P=0.0021). Moreover, AD-associated SNP, rs1304349, resulted in alteration of gene expression. Another AD-associated SNP, rs11933080, was also located at highly conserved regions of CCSER1 gene among various ortholog species indicating potentially functioning as cis-regulatory modules and functional important. We concluded that we identified CCSER1 variants in AD, for the first time, using two large cohort samples. This study provides insight into the genetic control of AD. **RESEARCH SUPPORT:** Dr. Xu's startup fund from the UTRGV.

ANXIETY-RELATED AND DEPRESSIVE-LIKE BEHAVIORS FOLLOWING INFLAMMATORY COLITIS INVOLVES NEURO-IMMUNE INTERACTIONS. VM Gadotti, Z Zhang, S M'Dahoma, G Andonegui, P Kubes and G Zamponi, Department of Physiology and Pharmacology, Hotchkiss Brain Institute and Alberta Children's Hospital Research Institute, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada

INTRODUCTION: Visceral inflammation contributes to recurrent visceral pain, abnormal behaviors and psychiatric co-morbidities. We have revealed behavioral, molecular and electrophysiological changes in inflammatory colitis-mice that are consistent with the development of depression and anxiety. **METHODS:** We used a 6-day oral delivery of Dextran Sodium Sulfate (DSS) to C57BL-6 mice into drinking water and assayed for anxiety and depressive behaviors using a wide range of in vivo tests. We also performed microarray and qPCR analysis of brain tissues, in vivo intra-vital microscopy of the frontal cortex vasculature and flow-cytometry analysis of total brain samples. Lastly, we conducted electrophysiological recordings (patch-clamp) of hippocampal neuron function using slices. **RESULTS AND DISCUSSION:** Compared to control animals, the DSS group exhibited reduced body weight and increased visceral hypersensitivity, as expected. They also showed reduced numbers of center crossings in the open field, along with reduced number of entries into, and time spent, in the open arms of the elevated plus maze. DSS-treated mice also displayed increased latency to interact with food in the novelty suppressed feeding test, reduced grooming in the splash test, and increased immobility in the tail suspension test. These behaviors were reversed by treatment with bretazenil or imipramine. Synaptic events recorded from pyramidal neurons of DSS-animals were enhanced, indicating that CA1 pyramidal cells undergo plastic changes after inflammatory colitis. Microarray of ventral hippocampus demonstrated that genes involved in neuro-inflammation are upregulated, such as Lrg1, AMWAP and SNAT5. Quantitative PCR of total hippocampus revealed an elevation of IL-1β, consistent with reports implicating this cytokine in depression. Finally, neuro-inflammation was supported by intra-vital microscopy and flow-cytometry that revealed an increased infiltration of both classical (CCR2hiCX3CR1low) and patrolling (CCR2lowCX3CR1hi) monocytes, and it a normal state of microglia cells. Altogether, we show that visceral inflammation triggers processes that result in alterations of hippocampal neuron signaling that gives rise to depression and anxiety. **RESEARCH SUPPORT:** Canadian Institutes of Health Research-CIHR.

AFTERNOON SESSION

VALIDATION OF ANALYTICAL PLATFORMS TO STUDY CALCIUM BINDING PROTEIN, SPERMATID-ASSOCIATED 1 (CABS1) AS A BIOMARKER OF PSYCHOLOGICAL STRESS IN HUMAN SALIVA. EA Reyes-Serratos, M Marcet-Palacios, T Ritz and AD Befus, University of Alberta, Southern Methodist University, Alberta, Canada

INTRODUCTION: Calcium binding protein, spermatid-associated 1 (CABS1) is a polypeptide found in human testes, submandibular glands and saliva. We raised four polyclonal antibodies against two CABS1 sequences. One antibody, named H2.0, detects multiple CABS1 immunoreactive bands in Western Blot (WB) analyses of acute and chronic stress in humans. Mass Spectrometry in a CABS1-over-expression control confirms that the bands are CABS1. Using H2.0 in saliva, we observed a constant 27kDa CABS1 band which levels increase after acute stress induced by the Trier Social Stress Test. We also found bands smaller than 27kDa. Subjects that showed these smaller polypeptides reported lower levels of stress. The objective of this study is to compare detectable CABS1 molecular forms between two analytical platforms, namely semi-quantitative WB and Wes. Wes utilizes a high throughput automated capillary-based instrument that separates proteins by size using minimal sample and antibody volumes, producing an immunogram composed of immunoreactive quantitative peaks. Moreover, Wes can analyse 72 samples per day, while WB can only analyse 18 samples within the same time span. **METHODS:** Saliva supernatants were studied for the presence of CABS1 peptides using WB and Wes with four anti-CABS1 polyclonal antibodies. Because migration patterns differ between WB and Wes, we developed and algorithm that converts the distribution of molecular weights among them. This allowed us to compare detectable CABS1 molecular forms across platforms. **RESULTS AND DISCUSSION:** Our data support the use of CABS1 as a biomarker of stress. Evidence suggests that Wes is a suitable immunoassay to analyse a large number of saliva samples in stress studies. In contrast to WB, Wes only detected one peak with H2.0 in saliva (35kDa). Interestingly, other CABS1 antibodies detected a different peak in saliva (59kDa). Ongoing studies intend to determine if Wes is an adequate platform to study the association of CABS1 with stress and resilience to stress. **RESEARCH SUPPORT:** The Allergy, Genes and Environment Network (AllerGen), a part of the Networks of Centres of Excellence (NCE) of Canada provide financial support.

ASSOCIATION BETWEEN EARLY LIFE STRESS AND CORTISOL REACTIVITY IN ADULT MALES. LM Baker and C Hansen, Keiser University Graduate School, Fort Lauderdale, Florida, USA

INTRODUCTION: Early life stress (ELS) is associated with chronic hypothalamic-pituitary-adrenal (HPA) axis dysfunction; however, both higher and lower HPA-axis functioning have been observed. While the majority of previous studies have examined ELS using a composite score derived from numerous types of stressors, the independent impact of abuse and neglect subtypes (i.e., physical abuse, emotional abuse, sexual abuse, emotional neglect, physical neglect) on HPA function in adulthood has not been rigorously investigated. Further, research examining differential effects of subtypes in adulthood have primarily focused on females. The present study was conducted to determine whether type of ELS is associated with differential cortisol reactivity in response to stress in adult males. **METHOD:** Salivary cortisol response to a cognitive stress test was examined in 159 males between the ages of 25 and 55 from the Midlife in the United States (MIDUS) Refresher Biomarker Project, 2012-2016. Cortisol reactivity was determined by the difference between the 30-minute post cognitive test and baseline samples. The severity of five types of ELS (i.e., physical abuse, emotional abuse, sexual abuse, emotional neglect, physical neglect) were measured using the Childhood Trauma Questionnaire. Individuals reporting severe depression symptomology on the Center for Epidemiological Studies Depression Scale (CESD) were excluded from analyses (CESD total score ≥ 16). Multiple linear regression was used to determine the relationship between subtypes of ELS and cortisol reactivity. **RESULTS AND DISCUSSION:** ELS predicted significant variation in cortisol reactivity ($p = .022$). Results of follow-up linear models revealed that sexual abuse was associated with a significant increase in cortisol reactivity in response to stress ($\beta = 21.84$, $t(153) = 2.85$, $p = .005$), while a trend emerged that suggested physical abuse was associated with a decrease in cortisol reactivity ($\beta = -10.73$, $t(153) = -1.77$, $p = .079$). Taken together these findings suggest physical and sexual abuse are differentially associated with cortisol reactivity in response to stress in adulthood. Evidence of persistent HPA axis dysfunction in adults with ELS are consistent with prior research findings, further emphasizing a need for early intervention and targeted treatment based on ELS subtype. **RESEARCH SUPPORT:** This research was supported by the United States Department of Health and Human Services. National Institutes of Health. National Institute on Aging (5P01AG020166).

THE RELATIONSHIP BETWEEN POST-STROKE DEPRESSION SUBTYPES AND STROKE LESION LOCATION IN ADULT FEMALES. CA Henry, LM Baker, C Hansen and LB Daniels, Keiser University Graduate School, Fort Lauderdale, Florida, USA

INTRODUCTION: Stroke is a significant public health concern, with approximately 50% of stroke survivors experiencing severe chronic complications. Research has indicated that post-stroke depression (PSD) is common (peaking roughly 3 months post-stroke) and significantly contributes to the severity of complications, and to stress on the patient and family. However, we currently lack a clear understanding of biological risk factors for PSD. Conflicting evidence deliberates stroke lesion location and age in females as potential risk factors. While previous studies have examined PSD as a homogeneous construct (using a single score to represent the existence of a multi-dimensional disorder), depression symptomology is highly heterogeneous. This study examined the association between lesion location and depression subtype (somatic, negative affect, anhedonic) in female stroke survivors. **METHOD:** The sample included 46 female ischemic stroke survivors (aged 41-55; right hemisphere [RH] n = 25; left hemisphere [LH] n = 21) enrolled in the Stroke Recovery in Underserved Populations Project. Depression symptomology was measured using the Center for Epidemiological Studies Depression Scale (CESD) at two time points (discharge from the rehabilitation facility and approximately three months post-discharge). Depression subtype scores were determined by calculating the difference between scores at discharge and follow up. A multivariate analysis of variance was used to determine whether depression subtype scores differed between individuals with strokes localized to RH or LH. **RESULTS AND DISCUSSION:** A significant main effect for lesion location was identified for CESD scores (Wilks' $\lambda = .82$, $F(3, 42) = 3.19$, $p < .05$). Follow up univariate analyses revealed that lesion location had a significant effect on CESD somatic depression ($p < .05$), with an increase in depression over time in the RH group and a decrease in depression in the LH group. However, lesion location did not have a significant effect on negative affect or anhedonic depression scores. Results suggest damage to neural pathways within the RH are associated with increased vulnerability to somatic symptoms of depression following stroke, and emphasize the need for early depression intervention and detailed monitoring of depression symptomology over time. **RESEARCH SUPPORT:** This research was supported by the United States Department of Health and Human Services. National Institutes of Health. National Institute on Aging (R01AG024806-05S1).

GOING WITH THE FLOW: ASSOCIATIONS BETWEEN PARTICIPATION IN GROUP-EXERCISE CLASSES AND OVERALL WELLBEING IN ACTIVE MATURE ADULTS. J Danilowski and C Hansen, Keiser University Graduate School, Fort Lauderdale, Florida, USA

INTRODUCTION: Senior adult populations are growing rapidly and are often faced with stressful transitions related to aging. Therefore, it is essential to find a way to encourage senior adults to live healthfully and mitigate the effects of aging. The answer may lie in understanding the relationship between Flow, stress reduction, quality of life, and exercise. Research was conducted on middle-aged individuals in order to determine what factors can impact overall well-being and techniques that can reduce stress while positively impacting these senior years. Flow is a transformative experience that expands an individual's awareness and understanding of the self, while simultaneously focusing on the development of positive emotions. Several of the nine dimensions of Flow directly impact an individual's state of wellbeing relating toto stress reduction, namely a reduction of self-consciousness, feeling successful and eliminating feelings of shame and guilt related to failure, as well as becoming more intrinsically focused. These nine dimensions have also been shown to increase self-efficacy and improve cognitive resources. Furthermore, much of the research surrounding Flow, and specifically the introduction of positive emotions, indicates that our brains operate much more effectively when they are in a state of positivity rather than neutrality or stress. Exercise is additionally one of the areas that has been known to be associated with Flow. **METHODS:** A total of 103 active mature adults, aged 40-65, who engage in some form of group exercise were voluntarily recruited to complete an online survey. The study included three scales within the electronic survey platform: The SHORT Dispositional Flow Scale (S DFS-2), The International Physical Activity Questionnaire Short Last 7 Days Self-Administered Format (IPAQ), and The Quality of Life Scale (QOLS), as well a demographic section and informed consent. **RESULTS AND DISCUSSION:** Results demonstrated a significant association between Flow and overall quality of life in this sample of older adults. Additionally, results indicated a trend toward a significant association between quality of life and total level of exercise; however, no relationships were found based on the level of intensity of the exercise (vigorous, moderate, or walking). Flow significantly predicted quality of life in this sample. No significant relationship was found between Flow and exercise level.

ADULT ATTACHMENT STYLE'S ASSOCIATION WITH A SEROTONIN TRANSPORTER GENE AND ITS POTENTIAL EFFECT ON MENTAL HEALTH. K Schroeder, V Bajnath and S Clark, Nova Southeastern University, FL, USA

INTRODUCTION: The purpose of the current study is to establish an understanding of attachment styles of adults and genetic variation of the serotonin transporter promoter polymorphism (5-HTTLPR). Through a systematic review, we aim to gather and assess present information regarding attachment styles in association with the serotonin transporter gene. The intentions of the study are to understand this association and how it can provide implications for comprehensive treatments, such as increasing the abilities of mental health professionals to promote healthy attachment, and to prevent mental health problems. **METHODS:** The literature review was conducted utilizing a range of search terms and databases (e.g., PsychInfo, Google Scholar, PubMed, etc.). The study selection included articles referencing adult attachment and 5-HTTLPR. The subjects frequently studied within the relevant literature are adults' attachment style utilizing the assessment, Adult Attachment Interview. Five studies were identified that encompassed the mentioned inclusion and exclusion criteria. **RESULTS AND DISCUSSION:** Adult attachment styles are influenced by the genetic differences of each individual and are positive or negative in nature. By understanding the effect of the 5-HTTLPR gene, mental health providers can understand how they can better serve adults with certain attachment styles. Adults with unresolved or insecure attachment may be at greater risk for developing a mental health disorder, such as depression. Mental health professionals can also understand how their client\'s environment and interactions leading to their presenting problems are related to these attachment styles. The literature review aims to determine the genes that can be isolated and focused on in adults with different attachment styles in order to develop early interventions and provide the necessary support for these adults. The relationship between attachment styles of adults and genetic variations of 5-HTTLPR has been studied by various researchers in recent years. Most recently, Troisi, Carola, and Gross (2017) illustrated how the 5-HTTLPR short allele was associated with an insecure style of attachment. Furthermore, Caspers and colleagues (2009) examined how the short 5-HTTLPR allele was strongly associated with increased risk for unresolved attachment. These research studies demonstrate the need for further investigation on isolating how the serotonin transporter promoter polymorphism affects adult attachment styles and overall mental health of an individual.

CURRENT VIEWS AND MANAGEMENT PREFERENCES OF PRE-PROCEDURAL ANXIETY ACCORDING TO INTERVENTIONAL RADIOLOGISTS. A Pendi, D Baron, A Ali, K Pendi, A Anavim, A Grewal, A Melkonian and R Ter-Oganesyan, University of California Irvine, University of Southern California, University of California San Diego, University of California Riverside, California Northstate University, Western University of the Health Sciences, CA, USA

INTRODUCTION: Pre-procedural anxiety (PA) is experienced by most patients undergoing interventional radiology (IR) procedures. Given that high PA has been linked to poor patient outcomes, research to determine best PA management practices has utility. This study was performed to identify radiologists' views of current practices to manage PA. **METHOD:** An anonymous, online survey was disseminated to members of the organization Society for Interventional Radiology (SIR). The 13-item survey included questions about the importance of PA management, assessment of PA, management techniques, and responsibility for PA management. Responses were described using simple quantification and analyses were carried out using Microsoft® Excel for Mac Version 16.10. **RESULTS AND DISCUSSION:** A total of 680 responses were obtained. The majority of respondents noted that PA was somewhat important in their practice (n=363, 57.0%), very important for patients (n=439, 68.8%), and sometimes interfered with healthcare delivery (n=388, 60.9%). Although most respondents did not formally assess severity of PA from patients (n=563, 88.2%), most would discuss it if raised by the patient (n=534, 78.5%). Most respondents preferred to use pre-procedural patient education (n=536, 87.7%), anxiolytic medication (n=459, 75.1%), and/or empathetic interactions with patients (n=392, 64.2%) to reduce PA. Radiologists followed by nurses, patients, primary care providers, family members, and mental healthcare providers were given most responsibility for the management of PA. The findings of this study suggest that radiologists are aware of the importance of PA in the clinical setting and are willing to address it. Although certain PA management techniques (e.g. patient education) were endorsed by most respondents, preferences varied. However, because most survey respondents did not ask their patients about PA, it may be useful to proactively discuss PA with patients during routine pre-procedural assessment. Future research is needed to determine whether these views are coherent with those of patients and other healthcare providers.

EFFECTS OF CHRONIC STRESS EXPERIENCE ON ZEBRAFISH BRAIN TRANSCRIPTOME. V Huang, A Butler, F Lubin, Department of Neurobiology, University of Alabama at Birmingham, USA

INTRODUCTION: Zebrafish (Danio rerio) have distinct behavioral, physiological, and neuronal responses to stressors. We were interested in how chronic stress is mitigated in the zebrafish brain, further, we hypothesized that chronic stress would affect learning and memory-associated gene expression. **METHODS:** Over a period of two weeks, we chronically stressed male and female adult zebrafish with unpredictable environmental changes, and subsequently compared their swimming behavior and gene expression to unstressed zebrafish. In the whole brain, we used reverse transcription quantitative PCR to measure candidate stress- and memory- associated gene expression in the whole brain. In addition, RNA-sequencing was performed on pooled samples of the telencephalon to identify transcriptome differences. **RESULTS AND DISCUSSION**: After chronic stress experience, telencephalon transcriptome differences revealed genes and gene ontology molecular function of structural molecule activity, consistent with mammalian studies of stress-responsive learning- and memory related genes. Adult zebrafish exhibited a decrease in the expression of hsd11b2, which is involved in cortisol deactivation. In chronically stressed vs unstressed females, there was a higher ache expression, which is found to impair memory in mammal and other teleost studies. Zebrafish in all groups spent most of the time at the bottom half of the novel tank, showing no difference in anxiety-like behavior. **RESEARCH SUPPORT:** This study was conducted with the approval of IACUC-20244 protocol, with support from R01 NIH/NIMH MH097909 Lubin (PI), the UAB Zebrafish Research Facility, and UAB Neuroscience Behavior Assessment Core P30 NS47466.

ACUTE EFFECTS OF DELIRIANT HALLUCINOGENS ATROPINE AND SCOPOLAMINE ON ZEBRAFISH. AD Volgin, OA Yakovlev, KA Demin, DA Meshalkina, PA Alekseeva, TG Amstislavskaya and AV Kalueff, Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg, Institute of Experimental Medicine, Almazov National Medical Research Centre, Military Medical Academy, Russian Center for Radiology and Surgical Technologies, St. Petersburg, Ural Federal University, Ekaterinburg, Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia; School of Pharmacy, Southwest University, Chongqing, China; The International Zebrafish Neuroscience Research Consortium (ZNRC), ZENEREI Research Center, Slidell, LA, USA

INTRODUCTION: Atropine and scopolamine are two well-studied 'classical' muscarinic cholinergic antagonists, with multiple actions in the peripheral and central nervous systems, and various side-effects. They potently affect human and animal behavior, inducing specific 'deliriant' hallucinations, affecting anxiety levels, memory and general locomotion. However, their exact psychopharmacological profiles remain complex and poorly understood, necessitating further preclinical testing of these CNS drugs and related compounds. Zebrafish (Danio rerio) are rapidly emerging as a powerful tool for psychopharmacology research. Here, we utilize zebrafih behavioral testing procedures to characterize acute neuroactive effects of atropine and scopolamine. **METHODS:** Behavioral testing was performed in adult wild-type outbred short-fin zebrafish between 11.00 and 17.00 h, using tanks with water adjusted to the holding room temperature, to assess zebrafish behavior in the novel tank test. Prior to testing, fish were preexposed in a 0.5-L plastic beaker for 20 min to either drug-treated or drug-free water. For treatments, fish were randomly divided in 4 groups (n = 15): drug-free control, 30 mg/L, 90 mg/L and 120 mg/L for atropine (Experiment 1); and 60 mg/L, 120 mg/L and 180 mg/L and 240 mg/L for scopolamine (Experiment 2). **RESULTS AND DISCUSSION:** Acute atropine strongly affected adult zebrafish locomotor behavior, as fish treated with 90 mg/L covered significantly longer distance than did control group and other groups tested (2374±71 cm vs. 1761±95 cm, $p<0.005$ by Dunn's post-hoc test for significant Kruskal-Wallis data). Compared to control fish, the maximal swimming velocity was also significantly higher in the 90 mg/L group (7.9 ±0.24 cm/s vs. 5.9±0.32 cm/s control, $p<0.003$). Finally, fish from the 120 mg/L cohort began to show increased minimum acceleration (1051±400 cm/s2 vs. 714±351 cm/s2 control, $p<0.05$), which was not observed in normal control zebrafish. In contrast, there was no significant difference between control and treated with atropine groups in meander, latency to the top, mean plot of not moving, top time or top zone transition endpoints. Thus, treatment with atropine lead to increased swimming velocity and distance covered, suggesting that atropine at doses tested may possesses hyperlocomotor 'deliriant' CNS properties. Acute scopolamine affected adult zebrafish behavior as well, as fish treated with 120 and 240, but not with 180 mg/L, have significantly decreased top zone transitions than did control group (12.5±1.9 n vs. 21.0±1.6 n control, $p<0.01$ and 12.6±1.7 n vs. 21.0±1.6 n control, $p<0.01$ respectively). The latency to enter the top was also significantly longer in the 120 mg/L, but not in the 180 mg/L and 240 mg/L group (94.4±14.6 s vs. 40.3±6.2 s control, $p<0.05$). Decreased number of entering the top was seen in fish treated with both 180 and 240 mg/L (26.1±1.7 n vs. 33.4±2.3 n control, $p<0.01$ and 20.4±3.0 n vs. 33.4±2.3 n control, $p<0.01$ respectively), whereas no changes were observed in locomotor endpoints (distance traveled, velocity). Fish from the 120 mg/L cohort began to show increased minimum acceleration (-50.4±24.0 cm/s2 vs. -748.4±58.1 cm/s2 control, $p<0.001$). Collectively, this profile suggests anxiogenic and/or mild psychostimulant simulative properties of scopolamine in zebrafish, which may be relevant to the drug's known clinical delirium-inducing effects. While further research is needed to dissect in detail the complex behavioral effects of these two compounds in zebrafish, the overall phenotypic vector of overlapping changes observed here, and the sensitivity of fish to both drugs tested, support their growing utility as powerful biological sensors and screens for hallucinogenic/psychotropic drugs. **RESEARCH SUPPORT:** the Russian Foundation for Basic Research (RFBR) grant 16-04-00851 to AVK. KAD is supported by the RFBR grant 18-34-00996.

Day 2. Saturday, June 23, 2018

Celebration Room, Holiday Inn Miami Beach-Oceanfront, 4333 Collins Ave, Miami Beach, FL

LAPIN SYMPOSIUM ON BIOLOGICAL PSYCHIATRY
Chair: AV Kalueff (China)

INTRODUCTION: PROFESSOR IZYASLAV LAPIN

This regular ISBS symposium is dedicated to Professor Izyaslav 'Slava' P. Lapin (1930-2012), a true pioneer of experimental neuro-psychopharmacology and biological psychiatry. Slava Lapin graduated from Pavlov Medical School in St. Petersburg, and shortly after receiving PhD, was invited in 1960 to establish the first psychopharmacology laboratory at the Bekhterev Psychoneurological Institute. The most important scientific contribution of Prof. Lapin was establishing the link between serotonin levels and mood-elevating (thymoleptic) action of antidepressants. He suggested that enhanced central serotonergic tone is essential for the mood-elevating effects of antidepressants. Lapin's serotonin hypothesis of antidepressant action, published (together with G Oxenkrug) in Lancet in 1969, became one the most cited papers published in this journal in the last 50 years. Lapin's studies have contributed greatly to the development of newest serotonergic antidepressants, such as SSRIs, currently representing the most prescribed group of psychotropic drugs in the world. Prof. Lapin was also the first to report the neuroactive effects of kynurenine and its derivatives – a discovery that opened another rapidly expanding area of glutamatergic psychopharmacology. A talented professional musician, prolific writer, painter, and an enthusiastic athlete, Prof. Lapin was a strong supporter of ISBS, and generously shared his knowledge with colleagues and students at our "Stress and Behavior" conferences and ISBS summer schools. His enthusiasm, friendship, generous support of junior colleagues, and the deep knowledge as both a clinical and experimental neuropharmacologist ('humanists' and 'animalists', as he called them), made a long-lasting impact on his colleagues and students. This ISBS symposium will continue Lapin's scientific legacy in the field of biological psychiatry and translational neuroscience.

ISBS OUTREACH: NEUROSCIENCE MEETS ARTS: AN ARTIST'S PERSPECTIVE (AUDIOVISUAL). D Raytchev, Daniela Raytchev Art, London, UK

ISBS LECTURE: NEW DEVELOPMENTS IN ZEBRAFISH MODELS IN TRANSLATIONAL NEUROSCIENCE RESEARCH. AV Kalueff, School of Pharmaceutical Sciences, Southwest University, Chongqing, China; Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg, Ural Federal University, Ekaterinburg, Russia; ZENEREI Research Center, Slidell, LA, USA

Anxiety and depression are wide-spread, debilitating psychiatric disorders. Mainly rodent-based, experimental animal models of anxiety and depression are extensively used to probe the pathogenesis of these common affective disorders. Here, we emphasize the need for innovative approaches to studying anxiety and depression in vivo, and call for a wider use of novel model organisms, such as the zebrafish (*Danio rerio*). Highly homologous to humans and rodents, zebrafish are rapidly becoming a valuable tool in translational anxiety neuroscience research, but have only recently been utilized in depression research. Multiple conceptual and methodological problems, however, arise in relation to separating putative zebrafish depression-like states from motor and social deficits or anxiety. Here, we examine recent findings and the existing challenges in this field, to encourage further research and the use of zebrafish as novel organisms in cross-species and cross-disorder modeling of affective states.

DEPRESSION AND DEPRESSION STIGMA IN CZECH UNIVERSITY STUDENTS: PRELIMINARY FINDINGS OF A CROSS-SECTIONAL STUDY. A Pendi, E Voslarova, K Pendi, D Baron, University of California Irvine, CA, USA; University of Veterinary and Pharmaceutical Sciences, Czech Republic; University of California Riverside, University of Southern California, CA, USA

INTRODUCTION: The prevalence of depressive disorders among university students has risen, mirroring global trends. Previous studies have identified personal and perceived stigmatized beliefs associated with depression among students at university. Given that social stigma has been reported to inhibit treatment-seeking behavior, further studies are needed to quantify stigmatized beliefs among university students worldwide. Therefore, this study was conducted to determine the prevalence of depression in university students in Czech Republic and study stigmatized beliefs in this population. **METHOD:** An anonymous questionnaire was sent via email to students at a public university in Czech Republic. The survey consisted of socio-demographic questions, Patient Health Questionnaire-9 (PHQ-9) to determine prevalence of depression (score≥10), and Depression Stigma Scale (DSS) to determine the stigmatization of personal and perceived beliefs. Analyses were conducted with IBM® SPSS® Version 25 for Mac. **RESULTS AND DISCUSSION:** Of 238 respondents, the majority were female (n=219, 92.0%), under the age of 23 (n=127, 53.4%), and indicated moderate stress on average (58.6±22.4). Nearly half of sampled students (n=102, 42.9%) exhibited moderate to severe depression severity according to the PHQ-9 scale. Respondents also exhibited more stigmatized perceived views compared to personal beliefs (20.4±5.4 vs 12.3±4.5, $p<0.001$). Stress level was discovered to predict depression severity ($b=0.1$, $t=9.4$, $p<0.001$). Older age was noted to be linked to decreased personal stigma ($b=-0.4$, $t=-3.3$, $p=0.001$). Other predictors did not reach statistical significance ($ps>0.05$). The results of this study suggest a higher prevalence of depression among university students than previously reported. The finding that students expressed more stigmatized perceived beliefs than personal ones is supported by prior studies of depression stigma. Ultimately, this study suggests a high prevalence of depression among university students in Czech Republic and stigmatization of beliefs pertaining to depression, which are similar findings to those reported in students from other countries.

DEPRESSION AND DEPRESSION STIGMA IN EGYPTIAN UNIVERSITY STUDENTS: PRELIMINARY FINDINGS OF A CROSS-SECTIONAL STUDY. A Pendi, J Ashraf, S Abou El Magd, M Khalil, S Gohar, K Wolitzky-Taylor, K Pendi, R Abdel Maksoud, N Adel, D Baron, University of California Irvine, CA, USA; American University of the Caribbean, St. Martin; Cairo University, Egypt; University of Oslo, Norway; University of California Los Angeles, University of California Riverside, University of Southern California, CA, USA

INTRODUCTION: As the worldwide burden of depressive disorders increases, rates and severity of depression have increased among undergraduate students. Barriers to mental healthcare such as social stigma have been noted to decrease likelihood of seeking treatment among students. This study was performed to assess the prevalence of depressive disorders among students in Egypt and quantify their depression-related stigmatized beliefs. **METHOD:** An anonymous, online survey was disseminated to undergraduate students at a large university in Egypt. The survey included questions about sex, age, and stress level (0-10 visual analog scale). Patient Health Questionnaire-9 (PHQ-9) was used to determine the prevalence of depressive disorder according to summed-item scoring method (score >=10). Depression Stigma Scale (DSS) was used to quantify severity of personal and perceived stigmatized beliefs. Stigmatization of personal and perceived beliefs was compared via t-test. A series of linear regression were performed to determine the relationship between sex, age, and stress on depression severity, stigmatization of personal views, and stigmatization of perceived views. Analyses were performed using IBM® SPSS® Version 25 for Mac. **RESULTS AND DISCUSSION:** Of 105 respondents with completed responses, the majority were male (n=78, 74.3%), over the age of 23 (n=81, 77.1%), and demonstrated a moderately high stress level (6.6±1.9). In the sample, 28.6% screened positive for depressive disorder (n=30). Study respondents also exhibited high perceived stigmatized beliefs compared to personal stigmatized beliefs (22.5±5.6 vs 15.0±4.8, $p<0.001$). Stress level predicted depressions severity according to regression ($b=1.1$, $t=4.4$, $p<0.001$). No other predictors reached statistical significance (all $ps>0.05$). This study suggests a high prevalence of depressive disorders and more stigmatized perceived beliefs regarding depression, supporting previous studies among undergraduate students in other parts of the world.

CURRENT PREFERENCES FOR PRE-OPERATIVE ANXIETY MANAGEMENT ACCORDING TO SPINE SURGEONS: A SURVEY STUDY. A Pendi, J Wang, F Acosta, R Movahedi, D Safani, A Shahbazi, A Melkonian, G Gucev, University of California Irvine, University of Southern California, Western University of the Health Sciences, CA, USA

INTRODUCTION: Pre-operative anxiety is exhibited by nearly all patients scheduled to undergo spine surgery. Although pre-operative anxiety has been linked to poor patient outcomes in a variety of surgical procedures, it has remained under-studied in the field of spine surgery. Therefore, an introductory study was performed to identify current views and preferences of spine surgeons for the management of pre-operative anxiety. **METHOD:** An anonymous questionnaire was sent to members of the international organization AO Spine North America to identify current preferences of spine surgeons regarding the assessment, management, and responsibility for pre-operative anxiety. **RESULTS AND DISCUSSION:** Complete responses were obtained from 69 participants. Respondents were predominantly male (n=66, 95.7%), orthopedic surgeons (n=52, 75.4%), and worked at an academic practice (n=39, 56.5%). Most spine surgeons were attending physicians (n=61, 88.4%), in practice for at least 20 years (n=52, 75.4%), and operated on 100-300 patients per year (n=48, 69.6%). A majority of spine surgeons (n=46, 66.7%) did not measure pre-operative anxiety. Most would discuss it if raised by the patient (n=40, 58.0%). Although anxiety management preferences varied, the most preferred methods included patient education (n=54, 78.3%) and permitting family members' presence (n=36, 52.2%). Spine surgeons assigned major responsibility to manage pre-operative anxiety to themselves (n=33, 47.8%), anesthesiologists (n=28, 40.6%), patients (n=28, 40.6%), nurses (n=26, 37.7%), and family members (n=21, 30.4%). Major responsibility was not as commonly assigned to mental healthcare providers (n=10, 14.5%) or other staff (n=3, 4.3%). **RESEARCH SUPPORT:** NIH Southern California Clinical and Translational Science Institute. **ACKNOWLEDGEMENT:** Presented at the 30th Association for Psychological Science Annual Convention. 2018 May 24-27. San Francisco, CA, USA.

METFORMIN INCREASE ANXIETY LEVEL IN RATS WITH METABOLIC SYNDROME INDUCED IN CHILDHOOD AGE. T Karatsuba, O Tkachenko, G Shayakhmetova, I Blazchuk and V Kovalenko, Toxicology Department, Institute of Pharmacology and Toxicology NAMSU, Kiev, Ukraine

INTRODUCTION: Among children and adolescents, overweight, obesity and metabolic syndrome (MS) are rapidly increasing in recent years as a consequence of unhealthy palatable diets. Recent data suggest that MS could contribute to the development and progression of disturbance in cognitive functions and behavioral. It should be highlighted that in very high-risk insulin-resistant children, pharmacotherapy with metformin may be indicated. Metformin can cross the blood-brain barrier and have specific effects on the central nervous system, although the exact mechanism and sites of its action remain uncertain. In addition, conflicting information exists about the beneficial versus adverse effects of on the brain. The present work reports the effects of metformin on behavior of male Wistar with MS induced in a childhood. **MATERIALS AND METHODS:** Wistar albino male rats of 21 days age (50–70 g) were divided into 3 groups (8 animals in each): 1 - control (intact young rats), 2 - young rats with MS, young rats with MS+metformin (266 mg/kg, intragastrically). MS was induced by full replacement of drinking water by 10% fructose solution. The behavioral of adolescent rats was studied in the open-field and in hole board tests after 60 days of MS modeling and metformin treatment. In the open-field during a 3-min trial the number of sections crossed, vertical standing positions, defecations (feces number) and urinations were recorded. The obtained data were calculated by one-way analysis of variance (ANOVA) and compared using the Tukey test. **RESULTS AND DISCUSSION:** Our findings suggest alteration of locomotor and emotional reactivity in rats with MS as compared with control. Particularly, in MS group we recorded decrease in vertical activity (34%) and increase in grooming behavior (54%) and defecation number (59%). In MS group with metformin treatment we have noticed more pronounced disturbance of behavioral patterns: horizontal and vertical activity were less than in control near 2 and 3 folds respectively; exploration activity was depressed as compared with control and MS group 4 folds; number of grooming reactions were less than in control more than 2 folds. Thus, we found an increased anxiety in animals with MS, which was more prominent in group with metformin administration. In general, the activity of animals (intersection of peripheral squares, vertical racks, exploration activity) was reduced, while the frequency of defecation increased. Also, number of grooming reactions remained low simultaneously with motor activity inhibition. Such results on behavioral activity of animals may indicate a definite state of depression. Our data provide support for possibility of negative metformin's effects on behavior of adolescent rats with MS. Future investigations are needed to do definitive conclusions about the effects of metformin on behavior and cognitive function as well as about the

cellular and molecular basis of its actions. Special attention should be given in the aspect of the use of metformin in childhood and adolescence. **RESEARCH SUPPORT:** National Academy of Medical Sciences of Ukraine.

BIOELECTRIC ACTIVITY OF THE BRAIN DURING EXPERIENCE OF THE VITAL STRESS. NK Apraksina, TV Avaliani and SG Tsikunov, Institute of Experimental Medicine, St. Petersburg, Russia

INTRODUCTION: The vital stress leads to development of the post-traumatic stress disorder which is characterized by the prolonged experience of the injuring event. EcoG (electrocorticogram) indicators can reflect the violations of a functional condition of structures of the brain caused by vital stress. The research objective was to assessment of influence of a vital stress on bioelectric indicators of the brain of female rats. **METHODS:** The research has been conducted on the group of Wistar female rats (n = 30), weight 180-200gr. The electrodes were implanted in frontal and occipital cortex on the right and on the left sides with Zoletil (Virbac S.A., Fr.) anesthesia (0.6 ml/kg). The psychogenic trauma in a group of female rats was modeled being placed in a terrarium to tiger python, where one of them is the victim of predator food needs. Registration of bioelectric activity of a brain in frontal and occipital areas was held respectively within 20 minutes each session at the left and the right. The index of rhythms in the range an alpha, a beta, a theta and the delta of frequencies was to estimate. Background values registered in the experimental room without python and in a terrarium with the python separated by a transparent partition. Both in the first and in the second case the animal with the telemetric registrar was placed in the separate transparent camera with perforation. Reliable differences of background values among themselves haven't been revealed. Further EcoG registration was carried out directly during drawing a psychogenic trauma in a terrarium with a python at an open partition, in 2 hours after a stress, on the 3rd, 7th days after influence. Assessment of bioelectric activity of a brain of rats was carried out according to the index of a rhythm (to the relation of number of fluctuations to total of fluctuations in 2 min.) in the range by an alpha, a beta, a theta and the delta of frequencies. The one-factorial dispersive analysis to repeated measurements (Repeated Measures ANOVA) with the subsequent a posteriori comparison by criterion of t – test for dependent selections adjusted for multiple comparisons was applied. **RESULTS:** The analysis of bioelectric activity of a brain stressed rats on indicators of the index of rhythms has revealed reliable differences from control. At the time of experience of a vital stress increase in the index the delta of a rhythm in occipital area is registered at the left and on the right. More expressed changes of bioelectric activity of a brain stressed rats are registered in two hours after a stress. On this term the delta of a rhythm in both occipital and in right frontal areas which are leveled by 7 days after a stress was noted increase in the index. Reliable fall of the index an alpha and a beta of a rhythm in comparison with background values in the right frontal area and in both occipital were revealed. Increase in the index a theta - a rhythm in right frontal and both occipital areas was registered in comparison with background values. The longest changes of the index of rhythms remaining up to 3 days from the moment of experience of a situation of threat of life are observed in the range the delta of frequencies. **CONCLUSION:** The vital stress leads to change of the EcoG parameters at female rats both during a stress, and during the delayed period. The most expressed changes of bioelectric activity of a brain were registered in two hours after a stress. Experience of a situation of threat of life at rats was shown in increase of the index the delta rhythm in occipital area directly during infliction of the psychogenic trauma.

GENDER, PSYCHOLOGICAL STRESS AND ALCOHOL CONSUMPTION. A NATIONAL SURVEY IN ECUADORIAN UNIVERSITIES. P Ruisoto, SL Vaca, Israel Contador, IES Abroad Salamanca, University of Salamanca, Salamanca, Spain; Técnica Particular de Loja, Loja (UTPL), Ecuador

INTRODUCTION: Alcohol consumption and psychological stress are currently two of the major public health challenges in the Western world due to their high prevalence, and major harmful consequences, including poor mental health, increase of absenteeism and reduction of labor productivity. However, the relationship between psychological stress and alcohol consumption in low- and middle-income countries remains underreported and further research about potential mediators is required. The aim of this study was to explore differences in gender and stress level over alcohol consumption in a large sample of universities in Ecuador. Differences across the roles (students, professors and administrative staff) and geographical regions (western, central and eastern coast of Ecuador) are also analyzed. **METHODS:** A large sample of 9465 members (83,51% students, 9,52% professors, and 6,90% administrative staff) were surveyed from 10 Ecuadorian universities (from west coast, center mountain and east region of Ecuador) using Perceived Stress Scale (PSS-14) and Alcohol Use Disorders Identification Test (AUDIT, Self-report version). A

factorial ANOVA was conducted to compare the main effect of gender, location by regions, role of participants and psychological stress level on AUDIT scores. Tukey tests were conducted for post-hoc comparisons. **RESULTS AND DISCUSSION:** Reported alcohol consumption was significantly higher in males, participants with higher psychological stress, students, and universities located in the central and eastern regions of Ecuador, where reported rates fell above the threshold of problematic alcohol consumption set by the World Health Organization. There was a significant interaction between gender and region (women reported consumption rates close to men in coast universities); and role and region (in coast universities, students reported alcohol consumption rates similar or even lower than professors and administrative staff). Actions to reduce the harmful use of alcohol in male students, in particular, from central and eastern universities of Ecuador remains a priority. **RESEARCH SUPPORT:** the Particular Technical University of Loja (Ecuador), National Council for the Control of Narcotic Drugs and Psychotropic Substances, and National Secretary for Higher Education, Science, Technology and Innovation of Ecuador via Project Prometeo.

EFFECTS OF CHRONIC MAFEDINE EXPOSURE IN ZEBRAFISH. YI Sysoev, DA Meshalkina, DS Petrov, SV Okovitiy, PE Musienko and AV Kalueff, Saint-Petersburg State Chemical Pharmaceutical University; Institute of Translational Biomedicine (ITBM), St Petersburg State University, St Petersburg, Russia

INTRODUCTION: In this study the investigated the effects of chronic 6-oxo-1-phenyl-2- (phenylamino)-1,6-dihydropyrimidine-4-sodium olate (mafedine), alpha-2 adrenergic receptor agonist, exposure on zebrafish behavior in the Novel tank test. The studied compound was administrated at the doses of 1 mg/L, 5 mg/L and 10 mg/L once daily during the 7 days. Madedine at 1 mg/L had a psychostimulating action, whereas higher doses caused anxiogenesis in zebrafish. **METHODS:** The study was performed in adult zebrafish. Behavioral testing was performed using the novel tank test. Mafedine was administrated at the doses of 1 mg/L, 5 mg/L and 10 mg/L once daily during the 7 days. Animals were randomly divided on 4 experimental groups, 15 fish in each of them: control, mafedine 1, 5 and 10 mg/L. Trials were recorded for 5 min by web-camera for further analyses. For each animal, the distance travelled (cm), the mean and maximum velocity (cm/s) and turn angle (deg) were estimated. Also the frequency and duration (s) of low mobility (the complete area detected as animal is changing with <20% threshold), high mobility (the complete area detected as animal is changing with >60% threshold) and not moving state (no changes of location, threshold was defined as: start velocity – 2.00 cm/s, stop velocity – 1.75 cm/s), the time spent in the top and in the bottom zones (s), the frequency of transition from bottom to top and latency time of the first bottom-top transition (s). The statistical significance of differences between groups was assessed using the Kruskal-Wallis test followed by Dunn´s post-hoc test. The level of confidence was set as 95%. **RESULTS AND DISCUSSION:** Chronic mafedine exposure at the dose of 1 mg/L led to reduce of low mobility state duration ($H=18.711$, $df=3$, $p=0.045$) in comparison with control fish. Also in this group the increase of high mobility state frequency ($H=14.203$, $df=3$, $p=0.049$) and duration ($H=17.473$, $df=3$, $p=0.026$) was observed. The higher doses of mafedine decreased the frequency of high mobility state and prolonged the time spent in the bottom zone of the tank, moreover these effects were dose-dependent. Generally, as mafedine increased the frequency and cumulative duration of high mobility state and decreased the low mobility state duration it can be assumed that studied compound has a psychostimulant action. Higher doses led to a rise of time spent in the bottom zone of the tank by fish, so it is a hallmark of anxiogenic action. It is important to point out that observed effects of mafedine were dose-dependent. In total, effects of chronic mafedine administration are similar as after 20-min acute exposure of mafedine at the dose of 60 mg/L, which had been previously reported. **ACKNOWLEDGEMENTS:** The research was supported by the Russian Foundation for Basic Research (RFBR) grant 16-04-00851 to AVK. The funders had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication. The authors declare no conflicts of interest.

OPTIMAL EXPERIENCES (FLOW) ARE CORRELATED WITH A MORE EFFICIENT ANTI-INFLAMMATORY CHOLINERGIC EFFERENT VAGUS NERVE PATHWAY. M Agnoletti, Verona University, Verona, Italy

INTRODUCTION: Aim of this study is to explore a possible correlation between frequency of Flow Experiences (called also Optimal Experiences) and level of cholinergic anti-inflammatory pathway's neural activation. Flow Experiences are experiences characterized by a specific psycho-physiological configuration (that include a neural and metabolic activation) that are protective against psychopathology and predict

physical health. Scientific literature indicates that when we experience negative emotions, our prefrontal cortex brain area (mainly the right hemisphere) is more active and induces, through a neural reflex that targets brain stem, an inhibitory action to the cholinergic anti-inflammatory pathway (vagal nerve). Cholinergic anti-inflammatory pathway regulates the innate immune response and it is the efferent arm of the inflammatory reflex, the neural circuit that responds to and regulates the inflammatory response. As a consequence of inhibitory action induced by negative emotion's prefrontal cortex activation, cholinergic anti-inflammatory pathway produces less acetylcholine useful for contrasting systemic inflammatory processes. In short, when our emotional state is negative, cholinergic anti-inflammatory circuit is temporarily inhibited from a neural reflex, induced by prefrontal cortex brain area, and then makes it more likely to have inflammatory processes. This study wants to explore if when we experience a more frequent positive emotional state (Optimal Experiences) we have a more efficient cholinergic anti-inflammatory pathway's (efferent branch of vagus nerve) neural activation with a consequent better anti-inflammatory acetylcholine output. **METHODS:** From a methodological point of view, hypothesis was tested using linear regression data (chi-squared test) from two informative sources. First source was the Flow Questionnaire survey added with a frequency index to distinguish, by an algorithm we created, between three main clusters of Optimal Experience frequencies (low, medium and high) in order to establish three comparable groups. In particular "high" frequency was considered when subjects have at least one optimal experience weekly, "medium" frequency was considered when subjects have at least one optimal experience monthly not weekly and "low" frequency was considered when subjects have less then an optimal experience monthly. The second source was the VLF (Very Low Frequency) index in order to measure neural interference with vagal nerve activity. VLF measure was collected by a non-invasive evidence-based medical device (photoplethysmograph) which detects HRV (hearth rate variability). Statistical data sample was collected from clients of a psychological private practice (Venice, Italy) trying to detect data at same time window (from 2 p.m. to 5 p.m.) in order to minimize oscillations measures due to the circadian rhythms detected by photoplethysmograph. Data was collected from 91 adults (from 18 to 78 y.o., 52 females and 39 males. **RESULTS AND DISCUSSION:** Statistical results confirm our hypothesis as we found a significant negative correlation (r value= 0,779; p value= 0,001) that means that the higher is the optimal experience frequency value, the smaller is the anti-inflammatory cholinergic pathway's index. **RESEARCH SUPPORT:** Alessio del Zotto for his statistical support.

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‘Progress not Perfection’ and upcoming ‘Capital’ projects are centered around people who currently suffer or have dealt with their addictions, whole spectrum of them. Abstract portraits of the participants who come from all walks of life show their past experience, present state of mind and future ambitions. Graphic nature in some cases suggests altered state of reality as well as playful, honest and open-minded approach to discussing many times stigmatized issue. Expressive character of the artwork relates to the fluctuating emotions, often accompanied by anxiety and depression, that is juxtaposed against clean ‘peaceful’ linework. There is certain beauty in capturing the chaos and vulnerabilities. Paintings include personal narratives of the subjects who Raytchev interviews and studies over the period of several sittings before creating the final large scale pieces.

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