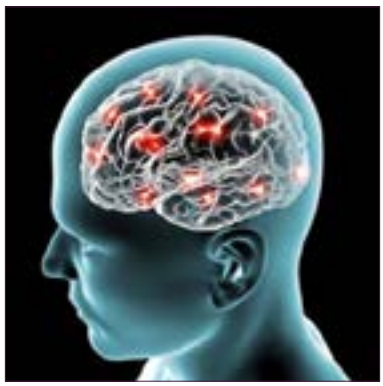
# Workshop
# October 16, 2017

## *Neuro 2017*

***Collaborator***

## *Primary Mental Health 2017*




17th International Conference on
**NEUROLOGY AND NEUROSCIENCE** &
4th International Conference on
**MENTAL HEALTH AND PRIMARY CARE**

October 16-18, 2017 | Toronto, Canada

# Robert G Harrington

*University of Kansas, USA*

## Theater of the oppressed as a creative strategy to cope with school-based gender identity bullying and cyber bullying

The purpose for the workshop is to share with attendees how theater of the oppressed has been used as a creative strategy to inform, prevent, and intervene in school-based gender identity bullying and cyber bullying and to share the results of two studies conducted using this creative theatrical approach. The goals of the workshop are to make the attendees leave it by gaining following key points in their mind. 1) To describe current forms of school-based gender identity bullying and cyber bullying and their ramifications on bullying targets and bystanders. 2) To describe how theater of the oppressed can be used as a therapeutic tool to help students, parents, the community-at-large, and mental health professionals to understand the impact and trauma associated with these two forms of bullying. 3) To describe two theatrical applications of theater of the oppressed: "it gets better project", a dramatic musical about gender identity bullying, and "out of bounds", a stage production about school-based relational bullying via cyber bullying. 4) To demonstrate the effects of theater of the oppressed through sharing our research results on audiences who attended and engaged in "it gets better" and "out of bounds." 5) To provide an opportunity for workshop attendees to engage in a theater of the oppressed activity as "SpecActors". Participants will be invited to form small groups and "stage" a response to a bullying incident from their own collective experiences. The purpose is to demonstrate how theater of the oppressed could be used in small groups as a therapeutic technique and 6) To share the touching "it gets better" PSA that was developed by a middle school group of students who attended the "it gets better" performance to show how theater of the oppressed can be used with clients who have been bullied or who are allies.

### Speaker Biography

Robert G Harrington has been working as a Professor at the University of Kansas for 38 years. He teaches and conducts research on bullying prevention and intervention. He works collaboratively with schools, mental health agencies, and other universities and has been an Invited Speaker at many conferences on the topic of bullying. He has been awarded the Social Justice Award for his work in the field of bullying. He is on the Editorial Board of the *journal, Bullying and Social Aggression.*

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*Notes:*

allied academies

# Scientific Tracks & Abstracts
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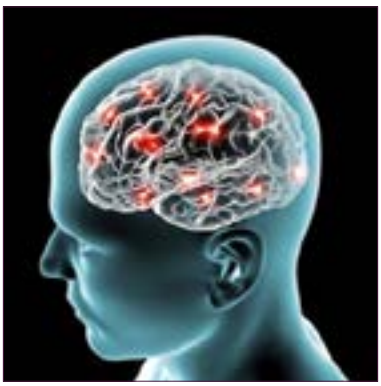


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## Symptoms in patients with ALS before and after onset of weakness

**Alexander Shtilbans, Mona Shahbazi, Kara Fields** and **Dale J Lange**
Hospital for Special Surgery, USA

Symptoms unrelated to weakness occur in patients with ALS. No studies systematically categorizing such symptoms onset and evolution with disease progression using patient reported questionnaires compared with controls exist. Therefore, these symptoms might be missed during patients' visits. Also it is not known if motor symptoms are the first manifestations, or if there might be other manifestations preceding the most obvious weakness-related symptoms by months or years. In this cross-sectional, retrospective study, we investigated the prevalence of various symptoms and their possible onset prior to weakness in 36 Amyotrophic Lateral Sclerosis (ALS) patients and 38 healthy controls using a newly designed questionnaire. The questions were chosen based on previously published literature and experience of the members of our Muscular Dystrophy Association and ALS Association Clinics. Besides musculoskeletal, symptoms from psychiatric, sleep, sensory, autonomic and extrapyramidal domains were most prevalent in the ALS group compared to controls. The most commonly reported symptoms besides muscle weakness in the ALS group were: muscle cramping and twitching, poor balance, stiffness, slowness of movements and feeling sad or depressed, compared to controls. Occasionally, these symptoms appeared before the onset of weakness although that was not statistically significant. The symptom burden correlated with advanced disease. There was a weak correlation of amount of these symptoms with ALSFRS scores. Our study shows that non-strength related symptoms in ALS patients are more common than in healthy controls and some may occur before onset of weakness. Additional studies are necessary to confirm this data and to further validate our questionnaire as a useful screening tool. The knowledge of various organ systems involved in the disease process would prevent failure to diagnose potentially co-morbid symptoms and improve individualized delivery of care.

### Speaker Biography

Alexander Shtilbans is an Assistant Professor of Neurology at the Parkinson's Disease and Movement Disorders Institute of Weill Cornell Medical College and Hospital for Special Surgery. His clinical and research interests are in Neurodegenerative Diseases in general and in Parkinson disease and ALS. Having started out as a Molecular Biologist in Neuroscience, after obtaining his PhD, he had transitioned into Clinical Neurology to work with patients and to better understand the clinical course of the diseases. He has received his Medical degree from Mount Sinai School of Medicine, where he also completed his residency in Neurology and served as a Chief Resident. Subsequently, he has completed his Clinical Fellowship in Movement Disorders at Columbia University. He has a longstanding interest in translational research and currently leads several NIH-funded clinical trials on Parkinson's disease as a Principal Investigator and is involved in studies on Amyotrophic Lateral Sclerosis. He has published in peer-reviewed journals and received awards from the American Academy of Neurology.

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## Anti-neutral glycolipids antibodies-mediated neurological disorder, EMRN: A subtype of MS?

**Tatsuro Mutoh, Shima S, Ueda A** and **Niimi Y**
Fujita Health University, Japan

Multiple Sclerosis (MS) is mainly involved in central nervous system (CNS) but not peripheral nervous system (PNS), whereas chronic inflammatory demyelinating polyradiculopathy (CIDP) is mainly involved in PNS but not CNS. Recently, however, a new clinical disorder involving both CNS and PNS is emerging called as encephalomyeloradiculo-neuropathy (EMRN). Several years ago, we discovered new type autoantibodies against neutral glycolipids in sera and cerebrospinal fluid (CSF) from these patients and the titers of these autoantibodies were well correlated with disease status (*Neurology* 2014), where we proposed that these autoantibodies can be served as a surrogate marker for EMRN. Since then, we have collected more than 20 similar cases at our department and other cases from abroad and all over Japan. The clinical phenotypes seem rather broad; some developed CNS impairment first followed by PNS involvements, others vice versa. There was no gender preponderance and most cases exhibit autonomic dysfunction. Among autoantibodies against neutral glycolipids, anti-lactosylceramide antibodies (α-LacCer) were most frequently detected. Previous studies have shown that α-LacCer activate inflammatory responses in neutrophils. We will discuss their biochemical and immunological actions on neuronal and astroglial cells as well as detailed clinical pictures of EMRN patients. The data strongly suggest that these autoantibodies against neutral glycolipids profound biological impacts on neuronal cells as well as glial cells in culture.

### Speaker Biography

Tatsuro Mutoh has completed his MD and PhD degrees from Nagoya University School of Medicine, Japan in 1980 and 1986, respectively. He was appointed as Assistant Prof. at Fukui Medical School in 1986. Then, he moved to National Institute of Health (NIH), NICHD, USA as a Visiting Fellow from 1987-1990, where he purified novel nerve growth factor-responsive protein kinases. He was promoted to Full Professor and Chairman at Department of Neurology, Fujita Health University, Japan in 2006. His expertise is Neuroglycobiology, protein-lipid interaction, and neuroimmunology. He has been acting as Board Member of Front Cell Neurosci, Front in Biosci, and so on.

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## Mutation profiling of 100 cerebrovascular disease patients based on targeted exome sequencing

**Wei li**
Capital Medical University, China

To explore the application value of the high-throughput second-generation sequencing technique in patients with suspected cerebral vascular genetic defects. We select 100 cases with suspected hereditary deficiency of cerebrovascular disease from January 2016 to June 2017 in Beijing Tiantan Hospital. DNA was extracted from the peripheral blood using a blood sample extraction kit. Then the DNAs were interrupted, repaired and connected to build the library. The Agilent capture chip was used to capture the exons and 30bp flanking sequences of exons of the 62 genes associated with hereditary cerebrovascular disease. Using the Illumina X10, the PE150 sequencing platform to sequence, using the BWA software to analysis sequence alignment, using the GATK software to detect the mutations, the artificial analysis is used to judge the mutation pathogenic type. And the pathogenic mutant site is validated by the ABI 3730 sequencing platform for the proband and his parents. There were 60 men (60%) and 40 women (40%) from 12 to 86 years old, the average age was 51 years (SD=13.1). Categorically 39 cases were denied the family histories, 43 cases were family histories, and 18 cases were not clear. 33 cases of known or suspected pathogenic mutations were detected, accounting for 33% of the overall detection rate, including 12 cases of pathogenic mutations and 21 cases of suspected pathogenic mutations. No family history or unclear samples were detected 15 cases with mutation (detection rate 26.32%). The *NOTCH3* gene mutations (CADASIL) were detected in 24 samples (72.73%); the *COL4A1* gene (cerebrovascular disease) mutations were detected in 2 samples (6%); the *KRIT1* gene mutations (cerebral cavernous hemangioma) were detected in 3 samples (9%); and respectively the *PDCD10* (cerebral cavernous hemangioma), PRNP (prnp-related amyloid angiopathy), COL4A2 ( Intracerebral hemorrhage, susceptibility to), COL5A1 (Ehlers-danlos syndrome, Classic type) gene mutations were detected in one each (3%). The *NOTCH3* gene had 23 missense mutations and one INDEL mutation, including 16 reported sites and 8 new mutation sites. The target region capture technique in high-throughput second-generation sequencing can be effectively applied to genetic detection of hereditary cerebrovascular disease; and there is a higher mutation defected rate in the family history sample; and the *NOTCH3* gene mutation is an important proportion in hereditary cerebrovascular disease.

### Speaker Biography

Li Wei is a Doctor of Neurobiology, Chief Physician and Associate Professor of Neurology. He is specialized in the genes and correlation study of cerebral vascular disease.

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*Notes:*

## Primitive social rank and assertiveness disorders: Towards a new model of neurobehavioral therapy for psychotic disorders

**Camille Lefrançois**
Funds of Environmental Medicine Institute (Fonds Institut de Médecine Environnementale), France

Several studies and observations tend to highlight one continuum between an excess and a lack of self-confidence, and a second one between an excess and a lack of trust in others. Theory suggests that these types of behaviors are like vestiges of a primitive social rank and positioning relative to the group. Some of these behaviors could be involved and even take an active part in particular troubles as social phobia and anxiety, self-harm, depression, or at the opposite in antisocial personality disorder, oppositional defiant disorders, bullying, lack of assertiveness, narcissistic perversion, paranoia, etc. According to this point of view, the authors have experimented new role-playing exercises of acting as an antidote to the positioning of the individual relative to the group. This presentation exposes the details of the theory (neurological assumptions, autoregulation of these dynamics) and the different observations, precautions and results of this type of therapy, when considering adult and childhood cases. The effects of these skills concern the symptoms which appear in social anxiety, depression, obsessive and compulsive disorders, bullying and antisocial personality disorder.

### Speaker Biography

Camille Lefrançois is a Psychologist and Researcher in the domain of Neurocognitive and Behavioral Therapy. She has her expertise in improving mental health and wellbeing. Her research is about new models of understanding human neurocognition and behaviors, and psychiatric disorders. Her goal is to create and evaluate new therapeutic tools.

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## Promoting neural plasticity in human sensorimotor cortex to alter activity in upper limb muscles

**Aimee J Nelson**
McMaster University, Canada

My research aims to determine the mechanisms that mediate plasticity in the human sensorimotor cortex, as a novel means to alter the motor cortical output to skeletal muscles and influence the motor control of the upper limb. There are two forms of plasticity that are considered complimentary and fundamental to neural systems. Homosynaptic plasticity changes the efficiency of synapses that are themselves active during the induction of plasticity, a mechanism thought to underpin learning and memory formation. Heterosynaptic plasticity changes the efficiency of synapses because of input from another pathway to support learning through stabilizing synaptic weights. Transcranial magnetic stimulation (TMS) is a technique capable of inducing either hetero- or homosynaptic plasticity. Heterosynaptic plasticity is induced following repeat pairing of electrical stimulation of a peripheral nerve with single TMS pulses over the primary somatosensory (S1) nerve or primary motor (M1) cortex muscle representation. Heterosynaptic plasticity is induced using a protocol called rapid-rate Paired Associative Stimulation (rPAS) that delivers 600 nerve-TMS pairs at a rate of 5 Hz. RPAS induces long-term potentiation (i.e. neural plasticity) effects when the nerve-TMS interstimulus interval (ISI) is set to promote their coincident arrival in S1, based on the N20 latency of the somatosensory evoked potential (SEP). RPAS promotes long-term depression at ~ 10 ms ISI. Homosynaptic plasticity is achieved using 600 pulses continuous theta-burst stimulation (cTBS) and intermittent theta-burst stimulation (iTBS) to evoke long-term depression and potentiation effects, respectively. In this talk, I will describe evidence from recent publications and advances from my lab that use TMS protocols of RPAS and TBS to evoke neural plasticity in human sensorimotor cortex. The primary purpose of these approaches is to alter the neural output to muscles of the arm. This research indicates that different methods for inducing human neural plasticity in cortex yield varying results on the corticospinal excitability of arm muscles. This information provides information fundamental to creating new rehabilitation regimes that aim to improve arm movement following disease and neurological injury.

### Speaker Biography

Aimee J Nelson is an Associate Professor in the Department of Kinesiology at McMaster University. She has completed her PhD at the Institute of Medical Sciences, the University of Toronto. She received her first Post-doctoral appointment at the McGovern Institute for Brain Research, MIT, and was subsequently a CIHR-funded Post-doctoral fellow at Toronto Western Hospital. Her academic appointment began in 2008 at the University of Waterloo and she subsequently joined McMaster University in 2012 as a Canada Research Chair, Tier 2. Her research is focused on promoting neural plasticity in brain and spinal cord for altering hand control. Her research is in basic neurophysiology and neuroimaging and her research has application in neurological injury and disease wherein hand/arm control is impaired. Her technical expertise includes transcranial magnetic stimulation, functional, anatomical and spectral imaging, and electroencephalography.

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## Early changes in neuronal cells derived from isogeneic pair of normal and genomic edited Alzheimer's disease (AD)-iPSCs

**John Yu[1, 2], Ming-Wei Kuo[1]** and **Sheng-Wen Chen[1]**
[1]Linkou Chang Gung Memorial Hospital, Taiwan
[2]Academia Sinica, Taiwan

While patient-derived AD-induced pluripotent stem cells (iPSCs) can recapitulate AD phenotypes, the lack of isogenic pair of normal and AD-iPSC with identical genetic background for comparison may impede the detailed analysis of subtle pathophysiological changes in early stage of disease. We had developed a robust MS-based proteomic platform to explore these early changes of pathogenesis by comparing the protein expression in isogeneic pair of normal and AD-iPSCs derived neuron cells. In proteome-wide label-free quantitation of the isogenic pair-derived neural progenitor and neuron cells, the changes of proteome context are proportional to the neuronal differentiation, when compared to their iPSC state, as indicated by the Pearson's correlation coefficient of triplicate datasets. We then explored the changes caused by D678H mutation in amyloid-beta precursor protein (APP) by comparing the proteome between the isogenic pair during their neuronal differentiation process. Our results suggested that the differential display of proteome between WT and AD is more significant at the state of mature neuron at day 15 (NM15). Using Perseus to identify the statistically different expressed proteins between the isogenic pair of 71-WT-NM15 and 71-AD-NM15, we found 299 proteins with significant difference based on the significance criteria of false discovery rate (FDR) 0.01 and small positive constant (So). The 299 proteins were subjected to cluster analysis and presented by the heatmap, which revealed the up- or down-regulation of protein cluster caused by D678H-APP. Launching from these MS-based technology platform, we are now focusing on finding potential pathological/diagnosis markers for AD. We selected candidate genes from these 299 proteins and confirm the changes of mRNA expression during neuron differentiation in the iPSC pair. We also found that alterations of these gene expressions in iPSC lead to changes of amyloid 40/42, characteristics of AD phenotypes.

### Speaker Biography

John Yu is Distinguished Chair Professor/Director at Institute of Stem Cell/Translational Cancer Research, CGMH. He is also Distinguished Visiting Research Fellow at Institute of Cellular and Organismic Biology, Academia Sinica, and was the Director for the same Institute (2002-2009). He is the founding President for Taiwan Society for Stem Cell Research. He was elected to serve in ISSCR Committees (USA), the Steering Committee of Asia-Pacific Stem Cell Network, and Advisor for Stem Cell Biology, Kumamoto Univ. He was the Director of Exp. Hematology (1998-2002) at Scripps Research Institute, USA. He has received an Established Investigatorship Award from American Heart Assoc. and many other awards.

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## Enabling high-resolution bioelectrical imaging to improve large-scale monitoring of neural activity in health and disease conditions

**Hayder Amin**
Fondazione Istituto Italiano di Tecnologia, Italy

Notwithstanding the remarkable advances of the last decade in Biotechnology and Neuro-technologies, progresses in understanding brain disorders and in developing novel therapeutic strategies have remained stall. One of the today's challenges in neurodegenerative disease research is the lack of efficient predictive assays that can pinpoint the onset of disease mechanisms, and that can be used for drug development. In this respect, the confluence of new emerging in vitro high-density chip-based technologies represents a unique opportunity. High-density multielectrode arrays (HD-MEAs) enable recordings of neuronal spiking activity of neuronal networks, simultaneously from several thousands of densely integrated electrodes (4096 electrodes). The result is an unprecedented and a unique sensing capability that provides access to extracellular signals in large-scale neuronal networks cultured on-a-chip. Furthermore, HD-MEAs allow studying neuronal ensembles and their responses (with single-neuron detail) to chemicals and drugs as well as for assessing developmental impairments of neuronal spiking activity in genetic models of various diseases. On the other hand, new methodology such as high-content imaging (HCI) is providing multiple cellular measurements from a single experiment. Here, we present a novel approach based on the combination of these methodologies, i.e. HD-MEAs and HCI, aim at characterizing neuronal function and network-wide dynamics in neurodegenerative and neurodevelopmental disorders and translating these results into a human-based neural system. In particular, we demonstrate on-a-chip multimodal readouts; to reveal early activity-dependent effects induced by the excitotoxicity of Aβ oligomers in vitro hippocampal cultures of a neurodegenerative Alzheimer's disease (AD) model, to decipher critical developmental delay in an embryonic neuronal network of DiGeorge Syndrome, which is demonstrated by altered chloride cotransporters and aggravated electrophysiological developmental profile and to characterize electrical responses and spontaneous activity of human-iPS-derived neuronal networks.

### Speaker Biography

Hayder Amin is a Senior Post-doctoral Researcher at the Fondazione Istituto Italiano di Tecnologia (IIT). He has received a Master's degree in Biomedical Engineering from Martin-Luther University and completed his PhD in Microtechnology for Neuroelectronic and Neuroscience from IIT in 2015. His research employs a diverse range of competencies, including, but not limited to, neuroscience, electrophysiology, neurodegeneration, neurodevelopment, data analysis, and cellular and molecular biology. He is using a combination of cutting-edge approaches such as confocal, calcium and high-content-imaging, and large-scale electrical platform (HD-MEAs) toward the development, implementation, and evaluation of bioassays for drug development, disease models, and fundamental neuroscience applications. His interdisciplinary competencies aim at addressing the functional changes of neuronal network-wide activity in neurodegenerative disease (Alzheimer's disease), neurodevelopment in genetic mouse models (DiGeorge Syndrome), and translated applications in human cell-based assays for drug development and cell therapy.

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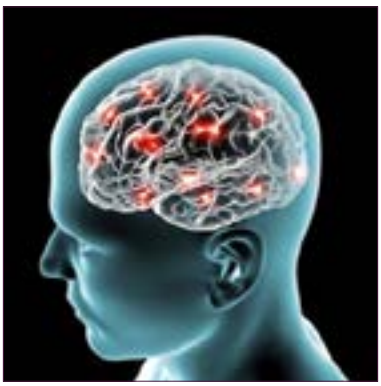


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## The effect of subthalamic nucleus deep brain stimulation on dyspepsia symptoms

**Atilla Yilmaz[1], Yucetas Cem[2]** and **Ugur Mustafa[1]**
[1]Mustafa Kemal University, Turkey
[2]Adiyaman University, Turkey

Parkinson's disease (PD) is a progressive neuro-degenerative disease and characterized by motor and nonmotor symptoms. Gastrointestinal symptoms like constipation and dyspepsia are common symptoms in PD. These symptoms can cause to significant morbidity. The patients often need to use several medications like antacids, proton pump inhibitors or H2 receptor blockers for long term. The beneficial effect of Deep Brain Stimulation (DBS) has proved by several studies. Subthalamic Nucleus (STN) and Globus Pallidus Internus GPI) are preferred targets for PD. There are several studies about the effect of STN-DBS on motor symptoms, but the studies about the nonmotor symptoms are limited. Our goal is to evaluate the effect of STN-DBS on functional dyspepsia. A total 25 patients (sixteen men and nine women), who underwent bilateral STN-DBS implantation between April 2016 and May 2017 were enrolled in this study. The median age was 57 years (range 38–80). The dyspepsia symptoms were evaluated before and three months after the surgery. Rome III criteria were used to diagnose the dyspepsia, postprandial bloating and epigastric complaints. The medications for these complaints are evaluated to. One patient was excluded because of the distal esophagus thickening diagnosis. Prior to surgery in 21 patients, at least one of these findings was observed. 17 (68%) patients were using medication regularly. In this patient group, postoperative evaluation was made on third month. 3 (17.6%) patients reported that they didn't feel any improvement on their complaints. In 5 (29.4%) patients, improvement and decrease in medication was detected. In 9 (52.9%) patient's improvement was detected and they reported that they don't need to take medication for dyspepsia anymore. Our results suggest that the bilateral STN-DBS surgery improves the dyspepsia complaints as well as life quality in Parkinson's disease patients.

### Speaker Biography

Yilmaz Atilla is currently an Assistant Professor at the Neurosurgery Department at Mustafa Kemal University. From 2015, he has served as a Clinical Fellowship in Koc University College of Medicine and Spine Centre, Istanbul, Turkey and as an Observer in Florida University Movement Disorder Centre, Gainesville, USA in 2016 and 2017. He has published more than 10 peer-reviewed journals and 100 conference papers. He is a Reviewer and Editorial Board Member for several journals in the field of Neurosurgery. He has also been invited as a speaker of many international conferences. His major research interests are: functional neurosurgery, neuromodulation and spine surgery. He also has a lot of experience about war surgery.

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## DNA nanoprobe for real-time imaging and simultaneous quantification of mitochondrial $Ca^{2+}$ and pH in neurons induced by superoxide anion and aggregated amyloid beta

**Yang Tian** and **Zhichao Liu**
East China Normal University, China

Mitochondria play vital roles in cellular energy production, signal transduction and $Ca^{2+}$ homeostasis, as well as the cell death. Besides, mitochondrial pH and $Ca^{2+}$ are closely associated with cellular functions and diseases. Thus, simultaneous imaging and biosensing are essential for understanding inter-relationship between $Ca^{2+}$ and pH in physiological and pathological processes. Herein, we created a highly selective DNA nanoprobe for real-time imaging and simultaneous quantification of pH and $Ca^{2+}$ in mitochondria, in which a new $Ca^{2+}$ fluorescent probe was synthesized and assembled onto a DNA nanostructure together with pH-responsive, inner-reference, and mitochondria-targeted molecules. This new nanoprobe powerfully tracked pH and $Ca^{2+}$ dynamics at the same localization in response to superoxide anion ($O^{2\bullet-}$)-induced oxidative stress and aggregated amyloid beta (Aβ) stimulation with a temporal resolution of milliseconds. Using this new tool, we discovered that acid-sensing ion channel 1a (ASIC1a) channel plays a vital role in $O^{2\bullet-}$ and Aβ-induced mitochondrial $Ca^{2+}$ burst, which may contribute to neuron death. Moreover, psalmotoxin 1 (PcTX1) effectively protects against neuron injury, providing a potential drug for $O^{2\bullet-}$ and/or Aβ-induced neuronal death. Using the DNA-assembled nanosensor for determination of pH and $Ca^{2+}$ at the same localization, we demonstrated that mitochondrial $Ca^{2+}$ is increased ~4-fold in neurons compared with HeLa cells, whereas mitochondrial pH exhibits no obvious difference between the two types of cells. Furthermore, experimental results demonstrated diverse mitochondrial $Ca^{2+}$ and pH values in different regions of neurons. The close relationship between $Ca^{2+}$ and pH in mitochondria was discovered. Mitochondrial pH value in neurons obviously increased with increasing $Ca^{2+}$ concentration, which may be attributed to the function of the $Ca^{2+}/H^{+}$ antiporter in mitochondria. On the other hand, the mitochondrial $Ca^{2+}$ burst can be adjusted by the ASIC1a channel during cytoplasmic acidosis. O2•- induces transitory cytoplasmic acidosis, which may activate the ASIC1a channel in the mitochondrial membrane, resulting in alkalization and $Ca^{2+}$ overload in mitochondria. Mitochondrial $Ca^{2+}$ overload is possibly one of the important factors in $O^{2\bullet-}$-induced neuronal death. These results offer a new view for understanding the signaling pathway of ROS-induced oxidative stress and neuron injury. Aggregated Aβ is highly toxic to neurons. After stimulation by Aβ25-35, the pH value in the cytoplasm clearly decreased together with the $Ca^{2+}$ burst, leading to acidification and $Ca^{2+}$ overload in mitochondria through ASIC1a. PcTX1 protein protect neurons from death by preventing mitochondrial $Ca^{2+}$ overload stimulated by $O^{2\bullet-}$ and aggregated Aβ, suggesting that PcTX1 is a potential drug for $O^{2\bullet-}$ and/or Aβ-induced neuronal death.

### Speaker Biography

Yang Tian, PhD is a Professor of Analytical Chemistry in East China Normal University. She received her PhD degree in Electronic Chemistry from Tokyo Institute of Technology. After a Post-doctoral training at University of Tokyo, she was appointed as a Professor in the Department of Chemistry at Tongji University, China in 2005. Then, she joined in East China Normal University as a specifically appointed Professor since 2013. Her research expertise is molecular imaging, biosensor, and bio-nanotechnology for understanding neuroscience. She has coauthored over 70 papers and book chapters.

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## Developing a virtual shared care model for headache neurology in Toronto: A triple aim study

**Jennifer Robblee**[1] and **Shawna Kelly**[2]
[1]University of Toronto, Canada
[2]University Health Network, Canada

**Introduction:** A "Triple Aim" study strives to improve the patient experience, population health, and reduce per capita costs within a target population. Migraine was identified to be the 6th leading cause of global years lived with disability in the Global Burden of Disease Study 2013. In Canada, the 2008 direct cost of migraine was over $300 million.

**Methods:** A triple aim approach is being undertaken in collaboration with a virtual interprofessional health team called Seamless Care Optimizing the Patient Experience (SCOPE) to improve migraine management. Primary care physicians (PCPs) registered with SCOPE have access to specialists including specialists like neurology, diagnostic imaging, and community services through a virtual hub with a nurse navigator. A SCOPE-related headache clinic has been developed with a neurologist and nurse practitioner interacting with the patients and PCPs in a shared care model through use of a bi-directional care plan and optimized communication. Patient & provider experience will eventually be measured with surveys; developmental iterations are currently based on qualitative feedback. Patient health and function are measured with a standardized score called the Headache Impact Test (HIT-6). To improve per capita cost, opioid use and emergency department visits are being tracked.

**Outcomes:** This initiative, which started officially in February 2017, has been well received thus far by patients and PCPs. There are currently 159 PCPs enrolled in SCOPE, and 101 SCOPE patients have been registered in the clinic. The care plan is qualitatively reported as helpful, and in its fifth iteration with plans for future electronic versions. Average HIT-6 at consultation is 64/78 (very severe), and will be track over time for reduction. Average weekly ED visits at the University Health Network for headache patients rostered with SCOPE PCPs are 5. On referral, 18% of patients were previously on opioids. We have discontinued opioids in 75% of those patients, and the remaining is being weaned.

**Discussion:** This type program is a longterm effort, and in its infancy. Significant changes are seen at the individual level, and already in per capita costs for opioid use. Changes at the population level for HIT-6 scores and per capita costs for ED visits will require a long-term analysis. Patients and PCPs are voicing approval of the shared care model. These changes will be tracked objectively and qualitatively for objective evidence of the promising patient stories thus far.

**Conclusion:** Migraine is a debilitating condition with massive cost to society. Management involves pharmacologic and lifestyle treatments that require significant counselling and co-management between the patient and healthcare team. A model of shared care between the patient, PCP, and neurology like SCOPE can improve patient experience. We plan to show improvements in the health of the headache population and decreased per capita costs as well as scale to other groups..

### Speaker Biography

Jennifer Robblee did her undergraduate degree at Dalhousie in Neuroscience, and then came to Toronto for Medical School at the University of Toronto. She completed her Residency in Neurology at the University of Toronto, and then started as a General Neurologist at UHN. While in her first year, she completed the MSc of Quality Improvement and Patient Safety (QIPS) and 2 years of the Veteran Affairs Quality Scholars (VAQS) program. She runs the Toronto Western Hospital General Neurology Clinic and the new KNC Headache Clinic. She is the Physician co-lead for the falls, which is one of the 6 hospital acquired conditions (HACs) identified as part of the Caring Safely initiative for UHN. She is also the SCOPE Neurologist. SCOPE is a program focused on family practices with high patient users of healthcare resources.

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## The spirituality of chronic pain and neurological disease

**Julian Ungar-Sargon**
Harrison College, USA

Over the course of a lifetime in clinical neurology and well documented in the literature that those who pay attention to the human dimension of pain and suffering and have the means and resources for spiritual and psychological care, do better in terms of outcomes. I have been interested in the spiritual dimension of pain and the way ethnic, cultural, social and religious variables affect the outcome of syndromes with the identical pathologies. I will be presenting cases that reflect the need to pay more attention to the way we frame illness and disease, since the narratives we obtain from patients often move us in the wrong direction. I claim that were we open spaces for the patient to reflect upon the human effect of disease in their lives and relationships, we might be better equipped to manage chronic pain and neurological disease in other ways than merely the pharmacological. In doing so, we also open ourselves to vulnerability and difficult philosophical questions referred to the meaning of suffering, theodicy etc. We therefore need to be equipped with our own spiritual tool kits to deal with such issues. The need for further data as to the efficacy of strategies addressing the human dimension of pain and suffering is urgently needed.

### Speaker Biography

Julian Ungar-Sargon teaches Health Sciences at Harrison College in Lafayette and works in full-time clinical practice that includes interventional pain management and neurology. He serves the Hoosier State in the Indiana Guard Reserve (MAJ) as Executive Officer (XO) and Commander of Physician Company of the 19th Medical Regiment. The goal on this command is to develop a rapidly deployable mobile medical unit to respond to terrorism, mass casualty, chemical and biological terror, protecting the citizens of Indiana. He was awarded the Merit of Honor medal by the OSMTH order of Templars in 2013 for medical service to the indigent of Indiana. He was Awarded Indiana's Highest Civilian Award, the Sagamore of Wabash in 2016 by Gov. Pence.

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## Regenerage system: therapeutic effects of combinatorial biologics (Bioquantine®) and spinal cord stimulation system on a patient with spinal cord section

**Joel I Osorio**
Westhill University School of Medicine, Mexico

As it has been previously demonstrated that co-electroporation of *Xenopus laevis* frog oocytes with normal cells and cancerous cell lines induces the expression of pluripotency markers, and in experimental murine model studies that Bioquantine® extract (purified from intra- and extra-oocyte liquid phases of electroporated oocytes) showed potential as a treatment for a wide range of conditions as Squint, Spinal Cord Injury (SCI) and Cerebral Palsy among others. The current study observed beneficial changes with Bioquantine® administration in a patient with a severe SCI. Pluripotent stem cells have therapeutic and regenerative potential in clinical situations CNS disorders even cancer. One method of reprogramming somatic cells into pluripotent stem cells is to expose them to extracts prepared from *Xenopus laevis* oocytes. We showed previously that coelectroporation of *Xenopus laevis* frog oocytes; with normal cells and cancerous cell lines, induces expression of markers of pluripotency. We also observed therapeutic effects of treatment with a purified extract (Bioquantine) of intra- and extra-oocyte liquid phases derived from electroporated *X. laevis* oocytes, on experimentally induced pathologies including murine models of melanoma, traumatic brain injury, and experimental skin wrinkling induced by squalene-monohydroperoxide. The positive human findings for Spinal Cord Injury and Cerebral Palsy with the results from previous animal studies with experimental models of traumatic brain injury, respectively. Because of ethical reasons, legal restrictions, and a limited numbers of patients, we were able to treat only a very small number of patients. These results indicate that Bioquantine® may be safe and well tolerated for use in humans, and deserves further study in a range of degenerative disorders. We propose that the mechanism of action of Bioquantine® in these various diseases derives from its unique pharmacology and combinatorial reprogramming properties. In conclusion, these preliminary findings suggest that Bioquantine is safe and well tolerated on patients with Cerebral Palsy and Spinal Cord Injury, among others. In addition to the regenerative therapy and due to the patient condition, we decided to include the Restore Sensor SureScan. Based on the of electrical stimulation for rehabilitation and regeneration after spinal cord injury published by Hamid and MacEwan, we designed an improved delivery method for the in situ application of MSCs and Bioquantine® in combination with the RestoreSensor® SureScan® Conclusions: To the present day the patient who suffered a total section of spinal cord at T12-L1 shows an improvement in sensitivity, strength in striated muscle and smooth muscle connection, 9 months after the first therapy of cell regeneration and 1 month after the placement of RestoreSensor® at the level of the lesion, the patient with a complete medullary section shows an evident improvement on his therapy of physical rehabilitation in standing for the first time and showing a progressively important functionality.

### Speaker Biography

Joel I Osorio is the CEO & Founder - Biotechnology and Regenerative Medicine at RegenerAge International ™ (www.regenerage.clinic).VP of International Clinical Development for Bioquark, Inc. (www.bioquark.com).Chief Clinical Officer at ReAnima™ Advanced Biosciences (www.reanima.tech) Westhill University School of Medicine. Mexico .Advance Fellow by the American Board of AntiAging and Regenerative Medicine (A4M)Visiting scholar at University of North Carolina at Chapel Hill (Dermatology)Fellow in Stem Cell Medicine by the American Academy of Anti-Aging Medicine and University of South Florida.

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## Modern technology and psychological well-being: VR interventions for the treatment of anxiety in cancer patients

**Konstantina Sokratous**
University of Paul Valery, France

Many stages of cancer treatment, as also the disease itself, can generate stress and anxiety for a lot of patients. According to the National Comprehensive Cancer Network 47% of cancer patient's suffers from anxiety. Although chemotherapy can be very effective and sometimes indispensable to treat cancer, a study showed that is directly correlated to depression. Another study showed that chemotherapy can cause anxiety and that anxiety is directly linked to coping strategies, with high anxiety levels leading to confrontation instead of problem solving strategies. Preoperative anxiety is commonly present in ambulatory surgery patients. Furthermore, the author demonstrated that patients with high levels of preoperative anxiety were more likely to experience physical discomfort and anxiety postoperatively. In 1997 in France, 20% of surgeries and 48% of anal tumor surgeries were done in ambulatory. The authors showed that these numbers were increasing each year. VR interventions were used in the past as a distraction to pain and anxiety. A systematic literature review of controlled studies showed with solid evidence that VR is an effective and feasible distraction, especially for reducing pain. Moreover, studies have shown that VR interventions have positive benefits and they promote wellbeing, as well as decreasing negative emotional states. Similarly, other studies showed decreased anxiety (measured by SAI) and decreased symptom distress immediately following chemotherapy with VR intervention. Therefore, our project aims to treat preoperative and postoperative anxiety in ambulatory cancer surgeries, as well as in chemotherapy, with the help of technology trends and more precisely virtual reality.

### Speaker Biography

Konstantina Sokratous has an Msc in Clinical Psychology and Psychopathology. The current research project is under evaluation for an intra- faculty funding, as well as for an external one for a phd. She has worked in Oncology services at the Gard's Cancer Institut in Nimes, France and she is currenty focusing on the promotion of psychological well-being in cancer patients.

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## Embitterment disorder and social avoidance: New link, model and behavioral therapy

**Camille Lefrançois**
Funds of Environmental Medicine Institute (Fonds Institut de Médecine Environnementale), Serbannnes, France.

A few studies tend to highlight the link between three specific disorders: embitterment disorder with or without suicidal behavior, behavioral addiction and avoiding behavior. This presentation exposes a new model of understanding the dynamics regulating the disorders. Further, the authors propose a new therapeutic method, based on a role-playing exercise focusing on the behavior avoided by the patient. By learning these therapeutic skills, the patients can see their avoiding, depressive and addictive behaviors and symptoms decrease. Several case studies and the testimony of several years of practice are also discussed.

### Speaker Biography

Camille Lefrançois is a Psychologist and Researcher in the domain of Neurocognitive and Behavioral Therapy. She has her expertise in improving mental health and wellbeing. Her research is about new models of understanding human neurocognition and behaviors, and psychiatric disorders. Her goal is to create and evaluate new therapeutic tools.

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## Representation of mental health in the media: Educating our youth about the messages to which they are exposed

**Anne T M Konkle**
University of Ottawa, Canada

The stigma associated with mental illnesses can be debilitating to individuals with these conditions. The public stigma results from the social endorsement of stereotypes about these conditions which can perpetuate the self-stigma of their internalization. The media is an important source of information about mental health; we see images on TV shows and movies, we hear about it in songs, we read about it in newspapers or news websites but perhaps as important, in our current technological age, is the information being presented on social media sites such as Facebook, Twitter, Instagram, and Tumblr, to name a few. The information being presented via all these media may be accurate or not, but may also present the mental health condition in a negative light, with negative tone or connotation, thus informing public perceptions and further perpetuating the stereotypes. We have been investigating the depiction of several mental health conditions in various media. This work has been conducted with University Students in the Faculty of Health Sciences, in order to help sensitize them to how their perceptions may be influenced by information presented via a variety of media sources. I will present some data pertaining to the representation mental health conditions in a mixture of media and speak to the educational opportunity this has presented to our youth undertaking this work. By researching media types, students become more aware of sources of information to which they are exposed on a daily basis. Students found that information is constantly being fed to us, even when it is not sought out, via advertisements in all types of media. There is often a disconnection between the media representation and the scientific literature. Educating our youth about the information to which they are exposed is a positive step toward ending the stigma surrounding mental health.

### Speaker Biography

Anne T M Konkle is an Assistant Professor in the Interdisciplinary School of Health Sciences at the University of Ottawa since 2009. She is interested in sex differences in brain development, behavior and disorder/disease. A multidisciplinary approach finds her investigating the media representation of mental health in order to better understand the information typically available to the lay person and how these might impact their perceptions and behaviors. With a focus on youth, she is attempting to help them understand mental health first is by helping to sensitize them to how their perceptions may be influenced by information presented via a variety of media sources and and secondly, to formulate an educational program that would allow students, from a young age, to be critical of the information to which they are exposed, especially as it pertains to mental health.

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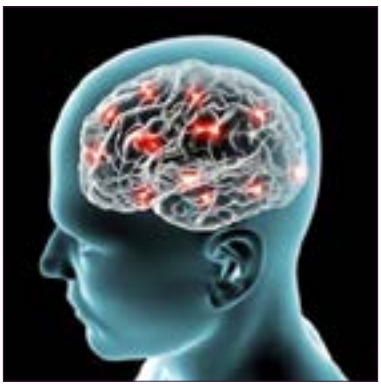
# Scientific Tracks & Abstracts
# October 18, 2017

## *Neuro 2017*

***Collaborator***

## *Primary Mental Health 2017*




17th International Conference on
**NEUROLOGY AND NEUROSCIENCE** &
4th International Conference on
**MENTAL HEALTH AND PRIMARY CARE**

October 16-18, 2017 | Toronto, Canada

## Molecular diagnostic yield of combined CNV and next generation sequencing in subjects with autism spectrum disorder

**Bashayer Al-Mubarak[1, 2], Hesham AlDhalaan1** and **Nada AlTassan[1, 2]**
[1]King Faisal Specialist Hospital & Research Center, Saudi Arabia
[2]King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia

Autism spectrum disorder (ASD) is a neurodevelopmental disorder with substantial genetic and phenotypic diversity. Structural alterations such as chromosomal abnormalities and copy number variations (CNVs) were the first culprits of ASD, however, they account for a small portion of the total cases. After the emergence of next-generation sequencing, the focus has shifted towards investigating the role of inherited and de novo point mutations using whole genome or whole exome approaches. The steep price drop and improved speed of whole exome sequencing (WES) have made this technology increasingly available as a diagnostic tool for patients with complex neurodevelopmental disorders. However, the clinical utility of WES in ASD is generally understudied and is yet to be determined in consanguineous populations. We describe here a comprehensive molecular analysis pipeline that could enable clinicians to establish molecular diagnosis with more confidence and has the potential to better inform genetic counseling. The study was performed on 135 individuals with confirmed diagnosis of ASD from 23 multiplexes and 81 simplex Saudi families. All samples were subjected to two step molecular evaluation. First, CNV analysis using the Affymetrix Cytoscan HD followed by next-generation sequencing using a customized gene-panel comprising 232 ASD associated genes developed by the Saudi Human Genome project team. Also, WES was carried out in a subset of samples in which no candidate variants were identified by the two former approaches. Disordered sleep, chronic headache, and decreased cognitive processing speed are common and often untreatable manifestations of traumatic brain injury that can devastate an individual's quality of life. Our results demonstrate the recoverability of chronic symptoms beyond what was previously thought possible? These findings have important applications in the fields of applied neuroscience and rehabilitation.

### Speaker Biography

Bashayer Al-Mubarak, PhD, Post-doctoral Research Fellow in the Behavioral Genetics Unit part of the Department of Genetics at King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia. She has completed her PhD in Neurobiology at the University of Edinburgh, which was focused on studying the transcriptional regulation of anti-oxidant defenses in neuronal and glial cells. Soon after obtaining her degree, she did her first Post-doctoral Fellowship with Dr. Alexander Jeans at the Department of Physiology Anatomy and Genetics (DPAG) in the University of Oxford, where she worked on investigating the role of presynaptic voltage-gated calcium channels in regulating a phenomenon known as "homeostatic synaptic plasticity" (an endogenous regulatory mechanism that maintains neuronal activity with normal levels) in hippocampal neurons. After completing her post at DPAG, she has joined the Behavioral Genetics Unit and has been working since then, on the genetic basis of neurodegenerative and neurodevelopmental diseases such as Parkinson's, Autism and Attention Deficit Hyperactivity Disorder.

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## Plasma metabolomic profiles: Insights into cognitive function

**Howard J Federoff**
University of California, USA

Our group has studied a longitudinal cohort of seniors, >75 years, to discover and internally validate peripheral blood measures that can accurately predict, which cognitively normal subjects will progress to amnestic Mild Cognitive Impairment (aMCI) or Alzheimer disease (AD) within less than three years. We initially reported on plasma metabolites that were accurate as a diagnostic technique for preclinical AD. We have extended these observations on plasma metabolomics and have discovered and validated a panel of 24 analytes that predict phenoconversion to Alzheimer's disease with accuracy of >96%. This discovery and internal validation work has now been externally validated. Finally, we described a subpopulation with superior neurocognitive function and discovered a plasma metabolomic signature that distinguishes this group from normal. I will discuss the implications of this body of work regarding cognitive function and its potential implications for dementia. Plasma metabolomics signatures correlate with cognitive status and discriminate between at-risk for AD, MCI/AD manifest disease, and separately identify individuals with superior cognition.

### Speaker Biography

Howard J Federoff is a Vice Chancellor for Health Affairs and CEO of UC Irvine Health. He oversees the clinical, health education, and research missions. He investigates gene therapy and neurodegenerative diseases. He has published greater than 250 articles and serves on the Editorial Boards of five journals. He has chaired the NIH Recombinant DNA Advisory Committee and the Gene Therapy Resource Program for NHLBI. He was President of the American Society for Experimental Neurotherapeutics. He has received his MS, PhD, and MD degrees from the Albert Einstein College of Medicine, internship, residency, and clinical and research fellowships at Massachusetts General Hospital/Harvard Medical School. He is a Fellow of the AAAS, National Academy of Inventors and American Neurological Association.

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