Mind-Body Interface International Symposium

PNIRSAsia-Pacific Symposium

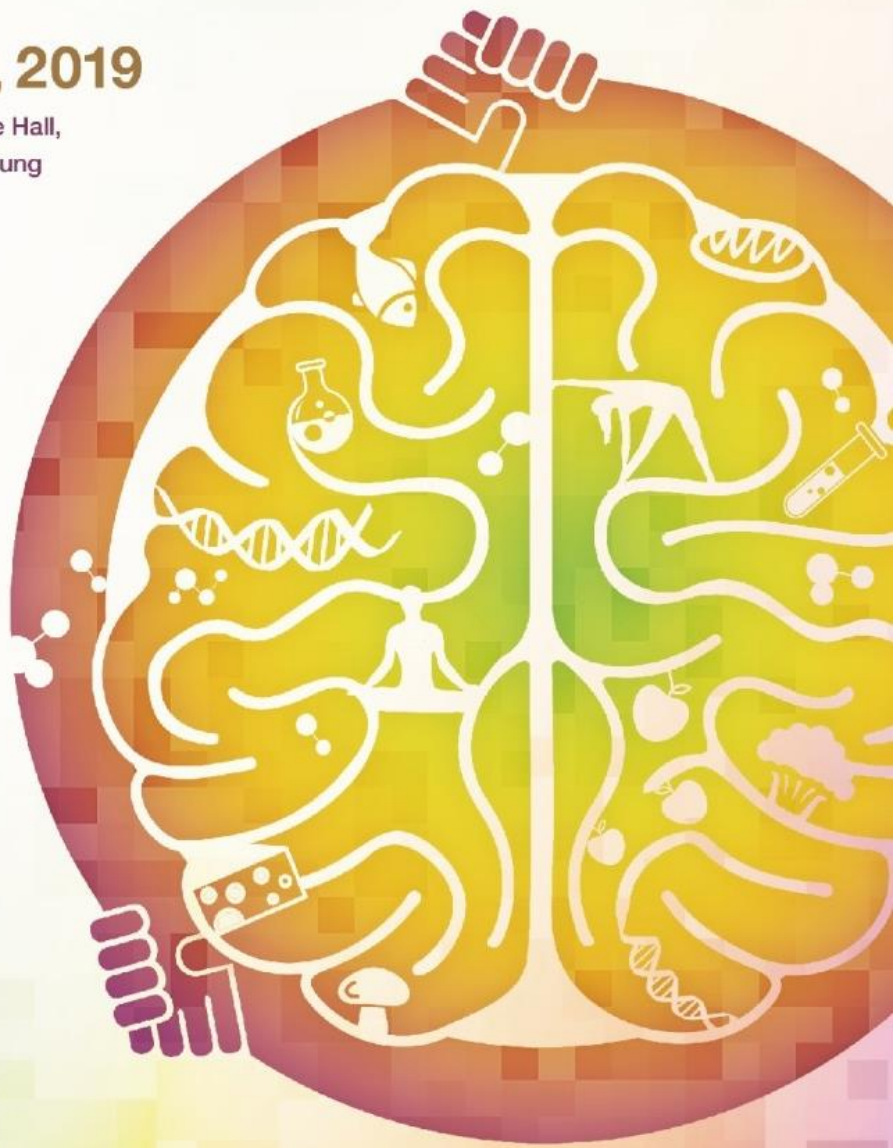
Chinese Forum on Nutritional Medicine

From Machine to Mind

Integrating the Use of Technology
and Science in Mental Health

Oct.7—9, 2019

International Lecture Hall,
Windsor Hotel Taichung



USEFUL INFORMATION FOR PARTICIPANTS

1. **Free WIFI** all around the conference venue (Account Name: windsor hotel).

2. sli.do - **Audience Interaction Made Easy**
   Join in and start sending questions
   STEP 1: Open the browser and type slido.com.
   STEP 2: Enter the **Event Code**.
   STEP 3: You're in! You can start posting questions.

Date	Session	Event Code
Mon 7 Oct.	PK1	#L586
	S11	#5271
	S12	#V580
	PK2	#H255
	S13	#P953
	S14	#S288
Tue 8 Oct.	PK3	#M496
	S21	#1501
	S22	#K624
	PK4	#A326
	S23	#Q481
	S24	#G311

3. **Post-Symposium Feedback- Help Us to Improve**

CONTENT

PROGRAMME OVERVIEW

	Mon 7 Oct. 2019	Tue 8 Oct. 2019	Wed 9 Oct. 2019
0830-0900	**REGISTRATION**		
0900-0920	**OPENING CEREMONY & GROUP PHOTO**	**REGISTRATION**	
0920-1000	**Plenary Keynote Speech 1** Kuan-Pin Su	**Plenary Keynote Speech 3** Richard Bazinet	
1000-1200	**S11. From Machine to Mind Session (I)** Device-Based Technologies in the Diagnosis and Treatment of Depression and Anxiety	**S21. Nutritional Psychiatry Session** Omega-3 Fatty Acids in Management of Depression and Anxiety: From Making Evidence to Dissemination to Practice	
1200-1300	**LUNCH & POSTER**	**LUNCH & POSTER**	
1200-1300	**S12. Chinese Forum on Nutritional Medicine**: Food Bioactive Ingredients and their metabolic benefits	**S22. REBAMP Sponsored Session**	
1300-1340	**Plenary Keynote Speech 2** Deborah Hodgson	**Plenary Keynote Speech 4** H. Rex Gaskins	**VIBRANT MIND & BODY WORKSHOP**
1340-1530	**S13. PNIRSAsia-Pacific Session (I)** Cross-talk Between the Immune and Central Nervous Systems	**S23. PNIRSAsia-Pacific Session (II)** Microbiome, Lifestyle and Neuropsychiatry	
1530-1600	**BREAK**	**BREAK**	
1600-1730	**S14. Glymphatic Session** Chances and Difficulties of Understanding the Neuroimmunology of Severe Mental Disorders	**S24. From Machine to Mind Session (II)** The Current Situation, Challenges, and Strategies of Utilizing Digital Health Tools in Mental Health	
1730-1800	**BREAK**	**AWARD CEREMONY & CLOSING**	
1830-2130	**S15. Glymphatic Colloquium: Brain on Fire** Movie with Souhel Najjar	**GALA DINNER**	

PROGRAMME DETAILS

Mon 7 Oct. 2019

0830-0900 **ILC**	**Registration**
0900-0920 **ILH**	**Opening Ceremony & Group Photo** *Mien-Chie Hung & Huey-Kang Sytwu & Kuan Pin Su*
0920-1000 **ILH**	**Plenary Keynote Speech 1:** *Kuan-Pin Su, Taiwan* From Machine to Mind: Making Translational Brain Research Powerful with Novel Technology *MODERATOR: Lu-Hai Wang*
1000-1150 **ILH**	**S11. From Machine to Mind Session (I)** Device-Based Technologies in the Diagnosis and Treatment of Depression and Anxiety *MODERATOR: David Mischoulon*
1000-1030	Brain Stimulators: Cranial Electrical Stimulation and Transcranial Direct Current Stimulation in the Treatment of Psychiatric Disorders *SK: David Mischoulon, USA*
1030-1050	Leveraging Smartphones and Wearable Sensors to Assess Depressive Symptoms *SS: Paola Pedrelli, USA*
1050-1110	Transcranial Photobiomodulation in the Treatment of Psychiatric Disorders: Can We Close the Loop? *SS: Paolo Cassano, USA*
1110-1130	The Role of Heat in the Treatment of Depression *SS: Maren B Nyer, USA*
1130-1150	**Q&A**
1200-1300 **WS & ILH**	**Lunch & Poster**
1200-1300 **WS**	**S12. Chinese Forum on Nutritional Medicine** Food Bioactive Ingredients and their metabolic benefits *MODERATOR: Liang Wang & Chia-Ming Chang*
1200-1215	Omega-3 Fatty Acids in Treatment of Clinical Hypertension in Chinese: Accumulative Evidence from Observational Epidemiological Studies to Randomized Controlled Trials *SS: Bo Yang, China*

1215-1230	Apple Polyphenols Extracts Alleviates High-Fat-Diet Induced Hepatic Steatosis in Male C57BL/6 Mice by Targeting LKB1/AMPK Pathway *SS: Xinli Li, China*
1230-1245	Intervention with Germinated Brown Rice in Type 2 Diabetes Patients-A Randomized Control Trial *SS: Yujuan Shan, China*
1245-1300	Ghrelin Modulates Dopaminergic Neuron Formation and Attention Deficit Hyperactivity Disorder-like Behavior *SS: Xi Li, China*
1300-1340 **ILH**	**Plenary Keynote Speech 2:** *Deborah Hodgson, Australia* Psychoneuroimmunology Looking to the Past and the Future: Contributing to Understanding Health and Disease Trajectories *MODERATOR: Jane Pei-Chen Chang*
1340-1530 **ILH**	**S13. PNIRS Session(I)** Cross-talk between the immune and central nervous systems *MODERATOR: Keith Kelley*
1340-1410	Social Defeat Stress Restructures the Neuroimmune and Hematopoietic Landscapes that Promote Anxiety and Inflammation *SK: Daniel B McKim, USA*
1410-1425	Microglia and its Functional Heterogeneity in Chronic Stress *SS: Li Tian, Estonia*
1425-1440	Neuronal Network Activity Controls Microglial Process Surveillance in Awake Mice via Norepinephrine Signaling *SS: Long-Jun Wu, USA*
1440-1455	An Intrauterine Inflammatory Challenge during Pregnancy Alters the Brain and Behavior of Exposed Offspring in a Sex-Dependent Manner *SS: Teresa M. Reyes, USA*
1455-1510	Breast Cancer Hijacks the Brain to Impair Its Function *SS: Adam K Walker, Australia*
1510-1525	Chronic Ocular Pain: from Basic Research to Clinic *SS: Annabelle Réaux-Le Goazigo, France*
1525-1530	**Q&A**
1530-1600	**Break**

1600-1745 **ILH**	**S14. Glymphatic Session** Chances and Difficulties of Understanding the Neuroimmunology of Severe Mental Disorders *MODERATOR: Karl Bechter & Huanxing Su*
1600-1630	Mild Encephalitis and Autoimmune Psychosis - from Hypothesis to First International Consensus *SK: Karl Bechter, Germany*
1630-1645	Intrathecal AAV9-mediated delivery of neprilysin protects against perivascular amyloid-β accumulation and improves cognitive deficits in a mouse model of cerebral amyloid angiopathy *SS: Huanxing Su, Macau*
1645-1700	Bio-inspired Molecular Design for Healthcare Impacts *SS: Yung Chang, Taiwan*
1700-1715	Diagnosis and Treatment Approaches to Autoimmune Psychosis - Discussion and Single Cases Presentations *SS: Dominique Endres, Germany*
1715-1730	Diagnostic and Therapeutic Dilemmas Inherent to Neuropsychiatric Disorders of Suspected Immune Origin, It's All One Brain *SS: Souhel Najjar, USA*
1730-1745	**Q&A**
1745-1830	**Break**
1830-2130 **ILH**	**S15. Glymphatic Colloquium: Brain on Fire** **"Brain on Fire"「我發瘋的那段日子」** *MODERATOR: Souhel Najjar & Ta-Wei Guu & Jane Pei-Chen Chang*
1830-1900	REGISTRATION
1900-1910	OPENING *Souhel Najjar, USA*
1910-1925	CASE REPORT Ta-Wei Guu, Taiwan
1925-2100	MOVIE: "Brain On Fire"
2100-2130	**Q&A**

1. PK: Plenary Keynote
2. S: Session, SK: Session Keynote, SS: Session Speaker
3. PNIRS: PNIRSAsia-Pacific Symposium (Psychoneuroimmunology Research Society)
4. ILH: International Lecture Hall, B1 國際會議廳/ WS: Windsor Square, 4F 溫莎廣場

Tue 8 Oct. 2019

0900-0920 **ILH**	**Registration**
0920-1000 **ILH**	**Plenary Keynote Speech 3:** *Richard Bazinet, Canada* The application of compound specific isotope ratio analysis to study polyunsaturated fatty acid metabolism in rodents and humans: Teaching an old technology new tricks *MODERATOR: Chon-Haw Tsai*
1000-1210 **ILH**	**S21. Nutritional Psychiatry Session** Omega-3 Fatty Acids in Management of Depression and Anxiety: From Making Evidence to Dissemination to Practice *MODERATOR: David Mischoulon & Yutaka Matsuoka*
1000-1030	Current Role of Natural Remedies in Psychiatry and Possible Mechanism of Omega-3 Fatty Acids *SK: David Mischoulon, USA*
1030-1050	Association of Use of Omega-3 Fatty Acids with Changes in Severity of Anxiety Symptoms: A Systematic Review and Meta-analysis *SS: Yutaka Matsuoka, Japan*
1050-1110	Utilizing the Delphi process for expert consensus of using omega-3 polyunsaturated fatty acids in the treatment of major depressive disorder *SS: Ta-Wei Guu, Taiwan*
1110-1130	Strategies of Dissemination, Communication, and Raising Awareness of the Benefits of Omega-3's in Mental Health *SS: Cherry Hui-Chih Chang, Taiwan*
1130-1150	Dietary Intake of Fish and N-3 Polyunsaturated Fatty Acids and Risk of Postpartum Depression: A Nationwide Longitudinal Study – The Japan Environment and Children's Study (JECS) *SS: Kei Hamazaki, Japan*
1150-1210	**Q&A**
1210-1300 **WS & ILH**	**Lunch & Poster**
1220-1250 **WS**	**S22. REBAMP Sponsored Session** *MODERATOR: Lee-Yan Sheen & Hua-Hsuan Tseng*
1220-1230	Social media addiction: why it's bad for mental health and relationships? *SS: Chotpitayasunondh Varoth, Thailand*

1230-1240	Efficacy and Acceptability of Varenicline for Alcoholism: A Systematic Review and Meta-Analysis of Randomized-Controlled *SS: Awirut Oon-arom, Thailand*
1240-1250	Pharmacological strategy in regulating Glymphatic function *SS: Senthil Kumaran Satyanarayanan, Macau*
1250-1300	Depression-free after Interferon-α (IFN-α) Exposure Indicates Less Incidence of Depressive disorder: A Population-Based *SS: Ching-Fang Sun, Taiwan*
1300-1340 **ILH**	**Plenary Keynote Speech 4:** *H. Rex Gaskins, USA* Contributions of Microbial Metabolism to the Gut-Brain Axis and Bacterial Sulfur Metabolism to Colorectal Cancer *MODERATOR: Ying-Chieh Tsai*
1340-1530 **ILH**	**S23. PNIRS Session (II)** Microbiome, Lifestyle and Neuropsychiatry *MODERATOR: Keith Kelley*
1340-1410	Should We All Eat Less? Behavioural, Endocrine, and Immunological Consequences of Calorie Restriction *SK: Stephen Kent, Australia*
1410-1425	Mind-Bugging: How do Bacteria Inside and Beyond the Gut Affect Brain and Behavior? *SS: Jan Pieter Konsman, France*
1425-1440	The Attenuation of Endogenous N-3 Pufas on Olfactory Bulbectomy-Induced Depression-Like Behaviour and Metabolomic Abnormalities in Fat-1 Mice *SS: Cai Song, China*
1440-1455	Early Life Stress and Enhanced Vulnerability to Develop Depression: Focus on The Interplay Between the Gut Microbiome and the Immune System *SS (OTA): Annamaria Cattaneo, Italy*
1455-1510	Omega-3 Fatty Acids in ADHD *SS: Jane Pei-Chen Chang, Taiwan*
1510-1525	Exercise and Lifestyle Factors in Children with Attention Deficit Hyperactivity Disorder: A Mixed-Methods Design *SS (OTA): George C.C. Hong, Australia*
1525-1530	**Q&A**
1530-1600	**Break**

1600-1730 **ILH**	**S24. From Machine to Mind Session (II)** The Current Situation, Challenges, and Strategies of Utilizing Digital Health Tools in Mental Health *MODERATOR: Yutaka Matsuoka*
1600-1630	Attempt to Quantify Psychiatric Symptoms Utilizing Information and Communication Technology and Machine Learning *SK: Taishiro Kishimoto, Japan*
1630-1645	Effect of Home-Based High-Intensity Interval Training and Behavioral Modification Using Information and Communication Technology on Cardiorespiratory Fitness and Exercise Habits Among Sedentary Breast Cancer Survivors: The Habit-B Study *SS: Yutaka J. Matsuoka, Japan*
1645-1700	Data Mining Based on Non-Parametric Bayesian Co-Clustering and Its Applications to Psychiatric and Mental Health Research *SS: Junichiro Yoshimoto, Japan*
1700-1715	Secure and Scalable Development of Digital Medicine Using Blockchain *SS: Taro Ueno, Japan*
1715-1730	**Q&A**
1730-1800 **ILH**	**Award Ceremony & Closing** *CHAIR: Lu-Hai Wang*
1830-2130 **HB**	**Gala Dinner** *Transportation is arranged. The bus is departing at 6 pm and returning at 9:30 pm*

1. PK: Plenary Keynote
2. S: Session, SK: Session Keynote, SS: Session Speaker
3. REBAMP: Research and Education Center of Bridging Asian Mental Health and Psychiatry
4. PNIRS: PNIRSAsia-Pacific Symposium (Psychoneuroimmunology Research Society)
5. OTA: Oversea Travel Awardee
6. ILH: International Lecture Hall, B1 國際會議廳/ WS: Windsor Square, 4F 溫莎廣場
7. HB: Hibiki Seafood Restaruant, No. 356 Shizheng North 2nd Road, Taichung; 響海鮮,台中市市政北二路 365 號

Wed 9 Oct. 2019

0830-1830 **Nantou County**	**Vibrant Mind & Body Workshop**
0815-0830	Meet up at Windsor Hotel Taichung
1000-1200	Workshop (I) *Michelle Chu*
1200-1400	Lunch
1400-1600	Workshop (II) *Michelle Chu*
1600-1700	Mindful Walk along the Lake
1700-1830	Say Goodbye and Back to Taichung

MODERATOR & SPEAKER

OPENING REMARKS

TIME **09:00-09:20, Mon 7 Oct. 2019**

Location **International Lecture Hall**

Moderator:

Mien-Chie Hung, PhD
President, China Medical University and Academician, Academia Sinica, Taiwan

Huey-Kang Sytwu, MD, PhD
Vice President, National Health Research Institutes, Taiwan

Kuan Pin Su, MD, PhD
Professor College of Medicine, China Medical University (CMU) , Taiwan
Director, Mind-Body Interface Research Centre, China Medical University Hospital, Taiwan
Chief, Department of General Psychiatry, China Medical University Hospital, Taiwan
Honorary Professor of Institute of Psychiatry-King's College London, UK

PLENARY KEYNOTE SPEECH 1

TIME **09:20-10:00, Mon 7 Oct. 2019**

Location **International Lecture Hall**

Moderator: Lu-Hai Wang, PhD

Vice President and Chair Professor, China Medical University, Taiwan

From Machine to Mind: Making translational brain research powerful with novel technology

Kuan Pin Su, MD, PhD

Professor College of Medicine, China Medical University (CMU) , Taiwan
Director, Mind-Body Interface Research Centre, China Medical University Hospital, Taiwan
Chief, Department of General Psychiatry, China Medical University Hospital, Taiwan
Honorary Professor of Institute of Psychiatry-King's College London, UK

The increasing global burden of major brain disorders calls for the development of novel approaches to tackle the challenge of unmet needs in prevention, diagnosis, and treatment. Due to the heterogeneity of clinical manifestations and etiological complexity, existing treatments shows modest effectiveness with limited effect sizes, and it is very difficult for “non-patentable” treatments (e.g. acupuncture, mindfulness, exercise, and lifestyle intervention) to catch the small signals. To date, clinicians are still struggling with trial-and-error practice without any reliable clinical or biological markers to predict therapeutic responses in psychiatric treatments. Therefore, it is important not only to focus on “Precision Medicine” research, but also to open minds to “Integrative Approaches” such dietary modification and nutraceutical prescription. In addition, there is a huge neglect about the fundamental diversity of ethnicity-specific and individual differences in psychopathology and biology. As Eastern medicine emphasizes on subjective (qualitative/personal) outcomes while the Western Medicine emphasizes on objective (quantitative/measurable) outcomes, it is still difficult to capture the small effects and make the individual differences measurable.

We need more advanced translational research tools and more sophisticate clinical trials. The new technology is arriving. Brain scientists can now apply various wearable devices to collect real-time, continuous, objective and dynamic data and to compute the complexity of human emotion, cognition, behaviors, and physiology with the advantage of artificial intelligence (AI). The AI technology can be applied to differentiate facial expression and vocal prosody patterns of patients with mood disorders. The wearable devices with wireless transmission enable continuous data collection of brain activities, heart rate variability (HRV), stress reaction, and sleep patterns. With the Information Communication Technology (ICT), new forms of data will be collected in a revolutionary way. At the end, the key for AI in psychiatry to success is to collect high-quality big data by excellent translational research teams that can conduct well-controlled, carefully-designed, prospective long-term human studies.

S11. FROM MACHINE TO MIND (I)

TIME **10:00-11:50, Mon 7 Oct. 2019**

Location **International Lecture Hall**

Device-Based Technologies in the Diagnosis and Treatment of Depression and Anxiety

Chair & Moderator: David Mischoulon, MD, PhD

Director, Depression Clinical and Research Program, Massachusetts General Hospital, USA
Joyce R Tedlow Professor of Psychiatry, Harvard Medical School, USA

Advances in technology have provided novel and evolving methods for diagnosing and treating psychiatric disorders. Device-based treatments are growing in popularity and the recent emergence of wearable devices that measure physiologic parameters are being investigated for their potential role as diagnostic tools in mood and anxiety disorders. We will present current lines of research in these areas. Dr Mischoulon will present an overview of device-based treatments of depression, including some work on cranial electrical stimulation (CES) from his group, and transcranial direct current stimulation (tDCS). Dr Pedrelli will present work on wearable devices used for diagnostic purposes in depressed populations. Dr Cassano will present novel research on photobiomodulation (PBM), a technology using near-infrared light (NIR) for treatment of depression and anxiety. Finally, Dr Nyer will present on the role of heat in the treatment of depression, with a focus on a device that provides whole body hyperthermia, and will also present some of her work on heated yoga, with a focus on the impact of heat on depression.

TIME: 10:00-10:30 **Session Keynote**

Brain Stimulators: Cranial Electrical Stimulation and Transcranial Direct Current Stimulation in the Treatment of Psychiatric Disorders

David Mischoulon, MD, PhD
Director, Depression Clinical and Research Program, Massachusetts General Hospital, USA
Joyce R Tedlow Professor of Psychiatry, Harvard Medical School, USA

Background: There has been a growth in the use and research of devices for treatment of psychiatric disorders. Two very popular small devices that can be used at home, with or without physician supervision, include cranial electrical stimulation (CES) and transcranial direct current stimulation (tDCS). Research is largely limited to small studies, often with open label designs.
Method: We reviewed the literature about CES and tDCS and provide a synthesis of what is known about these therapies. We also review findings from a recent trial of CES from our group.
Result: Findings overall are encouraging but mixed. Our CES study was limited by a high placebo response rate.
Conclusion: More research is needed into the efficacy of technologies such as CES and tDCS as potential treatments for psychiatric disorders. They may have a niche as augmentation therapy for individuals who are not responding adequately to standard antidepressants.

TIME: 10:30-10:50 **Session Speaker**

Leveraging smartphones and Wearable Sensors to Assess Depressive symptoms

Paola Pedrelli, PhD

Director of Dual Diagnosis Studies, Depression Clinical and Research Program, Massachusetts General Hospital, USA

Assistant Professor of Psychology, Harvard Medical School, USA

Background: Depression is the most common and disabling mental health disorder. Despite the availability of evidence-based treatments, between one third and one half of people suffering from Major Depressive Disorders (MDD) do not receive adequate treatment. Inability to closely monitor changes in severity of symptoms is one barrier to provide adequate treatment. The study examined the accuracy of assessing depressive symptoms by using passive monitoring methods including smartphone sensors, collecting activity and socialization indices, and wearable devices, collecting physiological data.
Method: A total of 41 individuals with MDD (74% females, 23% Hispanic, 71% white, and with a mean age of 33.7+14,) completed five in-person visits during which they underwent validated clinical interviews and were monitored continuously passively for eight weeks. Machine learning analytical methods were used to develop algorithms to estimate severity of depressive symptoms.
Results: Findings showed high compliance to wearing the sensors, suggesting feasibility of this methodology. An algorithm based on features from both the smartphones sensors and the wearables devices estimated depressive symptoms with high accuracy.
Conclusion: Behavioural and physiological indices may be utilized to passively monitor changes in depressive symptoms and to enhance early recognition of treatment response, relapse, and facilitate adequate treatment of MDD. Future studies are needed to replicate findings in larger populations with varying symptoms and severity.

TIME: 10:50-11:00 **Session Speaker**

Transcranial Photobiomodulation in the Treatment of Psychiatric Disorders: Can We Close the Loop?

Paolo Cassano, MD, PhD

Director, Photo-biomodulation Studies, Depression Clinical and Research Program, Massachusetts General Hospital, USA

Assistant Professor of Psychiatry, Harvard Medical School, USA

Background: Nearly all device-based therapies for psychiatric disorders are based on electromagnetic neuromodulation of the brain; we propose an approach –still relatively unexplored in psychiatry– to improve brain metabolism by treating psychiatric disorders with transcranial near-infrared light (NIR), targeting the central nervous system. Transcranial photobiomodulation (PBM) with NIR penetrates deeply into the cerebral cortex, modulates cortical excitability and improves cerebral perfusion and oxygenation. NIR is absorbed by mitochondria, boosts cerebral metabolism, promotes neuroplasticity, and modulates endogenous opioids, while decreasing inflammation and oxidative stress.
Method: This presentation explores the cellular mechanisms and the neurophysiology of PBM. We also review the latest findings on treatment of mood disorders with PBM and on cognitive enhancement of healthy subjects with PBM.
Results: Data on the neurophysiology of PBM are derived from the use of near-infrared spectroscopy (fNIRs) and electroencephalography (EEG) in healthy subjects. Original data from our group will be presented, both focusing on the neurophysiology and on clinical applications of PBM for the treatment of depressive and anxiety disorders.
Conclusion: PBM with near-infrared light is a new therapy for neuropsychiatric disorders in need of

further exploration. PBM could also potentially be used in healthy subjects to enhance wellness, cognition and eventually to prevent neuropsychiatric disorders. The lack of controlled-evidence and the lack of dissemination of scientific knowledge have limited the research on PBM in psychiatry. Future directions of research should contemplate the integration of sensors to personalize the delivery of PBM through closed-loop systems.

TIME: 11:00-11:30 **Session Speaker**

The Role of Heat in the Treatment of Depression

Maren B. Nyer, PhD

Director of Yoga Studies, Depression Clinical and Research Program, Massachusetts General Hospital, USA
Assistant Professor of Psychology, Harvard Medical School, USA

Background: Novel and effective treatments for depression are sorely needed. This presentation will examine the role of heat in the treatment of depression, with a focus on heated yoga and on a device that provides whole body hyperthermia (WBH). The literature on heat as a treatment for depression will be reviewed, and we will also present the results of our recent heated yoga pilot study (original research).
Method: Current evidence for, and methodology of a planned whole body hyperthermia (WBH) study will be discussed. Twenty-eight individuals with significant depressive symptoms were included in an open-label study of heated yoga, and asked to attend at least two 90-minute yoga sessions per week in two community heated yoga studios.
Result: Heated yoga was associated with reductions in depressive symptoms (clinician- and self-report) and associated symptoms (e.g., quality of life, anxiety, functioning). Attendance was associated with symptomatic improvement and adherence challenges were found. Progress on the establishment of our proposed study of WBH for depression will be reviewed.
Conclusions: Heat therapy and heated yoga represent potential novel avenues for treating depression. Further research is needed to develop the evidence-base for this innovative treatment area.

S12. CHINESE FORUM ON NUTRITIONAL MEDICINE

TIME **12:00-13:00, Mon 7 Oct. 2019**

Location **Windsor Square**

Food Bioactive Ingredients and their metabolic benefits

Moderator:
Liang Wang, MD, DrPH, MPH
Associate Professor (tenured), Department of Biostatistics and Epidemiology, College of Public Health, East Tennessee State University, USA

Chia Ming Chang, PhD
Associate Professor and Director, Division of Rehabilitation & Community Psychiatry, Chang Gung Memorial Hospital at Linkou, Taoyuan, Taiwan

The prevalence of chronic metabolic disorder including cardiometabolic dysfunction, obesity, diabetics, and mental disorders has received global attention in recent years. However, functional foods and natural health products in the diet are gaining increasing recognition as integral components of lifestyle changes in the fight against obesity and related metabolic diseases. Although not as well recognized, accumulated evidence from several preclinical and clinical studies has indicated that functional ingredients containing bioactive compounds (e.g., omega-3 fatty acids, phytochemicals, and macronutrients) could exert non-negligible physiological benefits in the daily diet, including suppression of appetite, lowering of blood lipids, prevention of adipocyte synthesis, and reduction of inflammatory response. Thus, the known bioactive components from food can be effectively applied in the treatment and prevention of diseases, and act simultaneously at different or identical target sites with the potential to impart physiological benefits and promotion of wellbeing including reducing the risk of cardiovascular disease, depression, inflammation, type II diabetes, and other chronic degenerative diseases. Herein, the critical research progress on the selected food functional components' benefits on hypertension, obesity, diabetics and mental disorders are presented, which help to clarify the role of nutritional medicine in prevention and clinical treatment of chronic metabolic disorders.

TIME: 12:00-12:15 **Session Speaker**

Omega-3 Fatty Acids in Treatment of Clinical Hypertension in Chinese: Accumulative Evidence from Observational Epidemiological Studies to Randomized Controlled Trials

Bo Yang, MD, PhD*; Wei Yu, MD; Xiao-Juan Guo, MD, PhD; Duo Li, MD, PhD.
Director of Institute of Lipids Medicine, Wenzhou Medical University, China

Background: Hypertension is a major public-health challenge because of a high prevalence and concomitant cardiovascular disease mortality and morbidity in China. Till now, no conclusive evidence was reported to demonstrate the omega-3 FA's antihypertensive properties in Chinese. Here, we review our group's relevant epidemiological studies and clinical trials to clarify the role of omega-3 FA in the treatment of hypertension.
Methods: Publications using the cross-sectional, case-control studies and clinical trial designs on the association of omega-3 FA (food or biomarker) with hypertension in Chinese adults were summarized.
Results: A large-scale cross-sectional study with FA determinations in serum demonstrated that increased serum compositions of omega-3 FA were associated with decreased prevalence of hypertension, especially eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). In a case-control study characterizing serum FA profile in hypertensive patients compared with normotensive controls, available data indicated that DHA was most efficacious in discriminating

hypertensive patients from normotensive persons, and increased DHA levels in serum were associated with decreased odds of newly diagnosed hypertension. Data from our RCT supported that marine-based omega-3 FA had a BP-lowering effect in Chinese hypertensive patients. The BP-lowering efficacy might be related to marine-based omega-3 FA correcting the imbalance of renin-angiotensin system and inhibiting the expression of downstream levels of MAPK phosphorylated protein.
Conclusions: Such findings may provide a novel insight on applying omega-3 FA to the managements of BP and to the clinical treatments of hypertension in Chinese population.

TIME: 12:15-12:30 **Session Speaker**

Apple Polyphenols Extracts Alleviates High-Fat-Diet Induced Hepatic Steatosis in Male C57BL/6 mice by targeting LKB1/AMPK Pathway

Xinli Li, PhD*; Deming LI, BSc; Fang LIU, BSc; Xinjing WANG, BSc
Associated Dean of Department of Nutrition and Food Hygiene, School of Public Health, Medical college of Soochow University, China

Background: Although previous studies supported the beneficial effects of single ingredient of dietary polyphenols on lipid metabolism, the role of apply polyphenols (AP), a mixture extracted from fresh apples, in ameliorating hepatic steatosis and the potential mechanisms are unclear, thus, we conducted this study.
Method: Thirty-three male C57BL/6 mice were randomly divided into three groups and were provided with high-fat diet (HFD) + ig. with aseptic water (0.1ml/10 g•bw) (CON group), HFD + ig. with 100mg or 400mg/kg•bw AP (0.1 ml/10 g•bw) (LAP and HAP groups) for 12 weeks respectively.
Results: In contrast to the mice in CON group, AP treatment significantly decreased the final body weight of mice and body weight gain, increased the ratio of serum Albumin/globulin (A/G), induced a downward trend of serum levels of alanine aminotransferase (ALT) and triglyceride (TG). High dose of AP treatment significantly decreased liver weight and reduced hepatic contents of TG and total cholesterol (TC), improved the histopathological features of hepatic steatosis supported by the decreased steatosis score and NAFLD activity score. High dose of AP treatment significantly up-regulated hepatic expressions of LKB1 and AMPK, down-regulated mTOR, p70s6k and HMGCR in protein levels, and increased levels of Ampk, Cyp27a1 and Cpt1α, and reduced expressions of Srebp-1c, Fas and Hmgcr were also observed in mRNA levels.
Conclusions: Our data supported the beneficial role of 400mg/kg•bw AP treatment in preventing hepatic steatosis by promoting bile acid synthesis, inhibiting lipogenesis and cholesterol synthesis regulated by via LKB1/AMPK pathway.

TIME: 12:30-12:45 **Session Speaker**

Intervention with Germinated Brown Rice in Type 2 Diabetes Patients-A Randomized Control Trial

Yujuan Shan, PhD*; Junli Ren, MD; Bo Pang,MD; Xinyue Song, MD
Project Evaluation Expert of the Ministry of Science and Technology, China
Experts in Accreditation of Dissertations of the Ministry of Education, China

Background: Inadequate intake of whole grains is associated with type 2 diabetes (T2D). Germinated brown rice (GBR), a whole grain food with both nutrition and mouthfeel, was consumed to explore the improvement in patients with T2D.
Method: A total of 81 patients with type II diabetes who met the test criteria were enrolled in the randomized control trial (RCT). They were randomly divided into intervention group and control group. The intervention group consumed 100g of GBR per day instead of some of the staple foods. The control group maintained a normal diet for a period of 3 months.
Result & Conclusion: Lower GI value of GBR (54) was measured and the GL value was around 7.78 (50g GBR). GBR contains much more amount of nutrients such as dietary fiber, calcium, magnesium, zinc, iron, niacin, thiamine and VB6. Additional bioactive components, which is rarely existed in

refined grain, such as GABA, ferulic acid were also found. The GBR obviously reduced the blood sugar index and blood fat index of patients with T2D. After the intervention, anthropometric data (body weight, BMI, waist circumference,) in both groups decreased significantly ($P<0.05$). Possible mechanisms were studied further including gut microbiota (inflammation and intestinal immunity), branched chain amino acids (BCAAs) metabolism and short chain fatty acids (SCFAs) metabolism. GBR improves the related biochemical indicators of type 2 diabetic subjects. Intake of 100g GBR is enough and effective to lower the levels of blood sugar, TG and HDL. GBR presents the beneficial effects through normalizing the composition of gut microbiota, alleviating inflammation, inducing degradation of BCAAs, as well as increasing production of SCFAs.

TIME: 12:45-13:00 **Session Speaker**

Ghrelin Modulates Dopaminergic Neuron Formation and Attention Deficit Hyperactivity Disorder-like Behavior

Xi Li, PhD

Deputy Director of Clinical Research Center, The Affiliated Kangning Hospital of Wenzhou Medical University
Distinguished Professor, Wenzhou Medical University, China

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder, and characterized by hyperactivity, inattention, and impulsivity, is one of the most common behavioral disorders with prevalence rates of 3-5% in children and adolescence. While ADHD patient often displayed metabolic abnormalities, however, the molecular mechanisms underneath are not well studied. In this study, we identified that a particular increase of homozygous mutation in orexigenic hormone PREPROGHRELIN /GHRELIN (T408T, Met72Met) in 248 ADHD patients. To further identity its role in ADHD, we generated 3 zebrafish mutant strains for ghrelin by TALEN and CRISPR/Cas9 mediated genome editing techniques and ghrelinΔ/Δ zebrafish displayed hyperactive, attention deficit-like and impulsive-like behaviors, mimicking human ADHD symptoms. These misbehaviors could be rescued MPH and Atomoxetine which were widely used to treat ADHD patients in clinical. Intriguingly, ghrelinΔ/Δ zebrafish exhibited downregulated expression of wnt1, wnt3a, wnt5a that are critical for dopaminergic neuron development to possibly regulate their number and spatial organization. We then found that reduction and misplacement of dopaminergic neurons and reduced levels of dopamine. Pharmacological blockade of wnt signaling with XAV939 induced a reduced moving activity and dopaminergic neuron, whereas, wnt agonist SB415286 rescued hyperactivity and dopaminergic neuron loss in ghrelinΔ/Δ zebrafish. Our zebrafish model for attention deficiency and hyperactivity disorder provides insights into genetic regulation and drug screens for the identification of novel treatments of ADHD.

PLENARY KEYNOTE SPEECH 2

TIME **13:00-13:40, Mon 7 Oct. 2019**

Location **International Lecture Hall**

Moderator: Jane Pei-Chen Chang, MD, PhD

Consultant Psychiatrist, Department of Psychiatry, China Medical University Hospital, Taichung, Taiwan
Visiting Researcher, IoPPN, King's College London, London, UK

Psychoneuroimmunology Looking to the Past and the Future: Contributing to Understanding Health and Disease Trajectories

Deborah Hodgson, PhD

Deputy Vice-Chancellor Research and Innovation University of Newcastle Director Laboratory of Neuroimmunology

At the conference I will talk on the history of Psychoneuroimmunology research and the implications, which cover the length and breadth of medical research. I will also talk about the particular research carried out in my laboratory in Australia, at the Laboratory of Neuroimmunology.
My own research is in a field known as perinatal programming. The concept of perinatal programming was formulated initially from the effects of malnutrition on the developing infant but has now been extended too many other domains.
The fundamental concept is that there can be a recalibration of many physiological processes in the developing baby via extrinsic events that impinge upon the mother. Although there is evolutionary benefit in the organism adapting for survival in its future environment, these permanent alterations may prove maladaptive in the long-term if the adult environment is incongruent with the early-life environment The effects of perinatal programming in determining later-life health and disease outcomes are consistently demonstrated in both human and animal literature. In this presentation I will talk about some of the recent discoveries that are providing novel explanatory mechanisms for a variety of pathologies in later-life including metabolic, affective, endocrine and psychiatric.

S13. PNIRSASIA-PACIFIC SESSION (I)

TIME **13:40-15:30, Mon 7 Oct. 2019**

Location **International Lecture Hall**

Cross-Talk between the Immue and Central Nervous Systems

Chair & Moderator: Keith W. Kelley, PhD

Professor Emeritus of Immunophysiology University of Illinois
Editor-in-Chief Emeritus Brain, Behavior, and Immunity

The Psychoneuroimmunology Research Society (PNIRS) has a global presence in promoting the discovery of new knowledge about interactions between the nervous and immune systems and their relationships with behavior and health. By focusing on the fundamental integrative physiology of reciprocal relationships between the immune system and brain, these scientists are changing the face of immunology and neuroscience, and more recently the gut. Inflammation is no longer taught in medical schools as only a local regional process with the classic symptoms of rubor (redness), calor (heat), dolor (pain), tumor (swelling) and loss of function. In its place, the concept of chronic, systemic inflammation is now recognized as a major factor in costly diseases such as cardiovascular, metabolic and mental health disorders. In this PNIRSAsia-Pacific-sponsored symposium, nine scholars from four continents will highlight some of their newest pre-clinical findings on the role of microglia in synaptic surveillance (Wu), stress (Tian) and their potential involvement in behavioral abnormalities associated with inflammation during neonatal development (Reyes). The impact of chronic stress on myelopoiesis, monocyte recruitment into the CNS and anxiety behavior will be presented (McKim). The emerging role of diet on interactions among the immune system, gut and brain will be highlighted by three experts. These talks will focus on caloric restriction (Kent), n-3 polyunsaturated fatty acids (Song) and signalling mechanisms across the gut and the blood-brain barriers (Konsman). New findings will be presented that suggest chronic ocular inflammatory pain primes ocular-related brainstem circuits (Réaux-Le Goazigo). Finally, the underpinnings of breast cancer-induced cognitive impairment as assessed by anti-inflammatory treatment will be presented (Walker). The collective theme of these lectures will reinforce and extend the concept of the importance of reciprocal communication between the immune and central nervous systems.

TIME: 13:40-14:10 **Session Keynote**

Brain Stimulators: Cranial Electrical Stimulation and Transcranial Direct Current Stimulation in the Treatment of Psychiatric Disorders

Daniel B. McKim PhD
Assistant Professor, Department of Animal Science, University of Illinois Urbana-Champaign, USA

Background: Psychosocial stress accelerates myelopoietic production of monocytes and neutrophils that traffic to the brain and augment anxiety behaviors. Stress-induced myelopoiesis is orchestrated by stromal cells in the hematopoietic niche, while brain-myeloid cell recruitment is mediated by dynamic intercellular signalling events surrounding the neurovasculature.
Methods: Myelopoietic and neuroimmune responses to murine repeated social defeat (stress) were characterized by flow cytometry, immunohistochemistry, and scRNAseq.
Results: Brain regions heavily activated by stress exhibited microglia activation, endothelial cell adhesion molecule induction, monocyte recruitment, and augmented vascular IL-1R1 signaling – all of which were dependent on neuronal activation and prevented by treatment with clonazepam. Meanwhile, microglia elimination or inhibition prevented monocyte recruitment and prevented prolonged anxiety. Depletion of myeloid IL1 beta also prevented prolonged anxiety behaviors. In the periphery, stress reshaped the myelopoietic landscape by inducing bone marrow stromal cell transcriptome signatures associated with increased myeloid progenitor proliferation (e.g., GMCSF,

MCSF, and IL6) and hematopoietic stem cell (HSC) mobilization (e.g., increased GCSF and reduced CXCL12). Mobilized HSCs engrafted into the spleen and established dramatic extramedullary hematopoiesis. This coincided with proliferation of a novel fibroblastic splenic stromal cell in stressed mice that expressed high levels of pro-myelopoietic chemokines and cytokines. Preliminary reveal that myelopoietic responses to stress occur independent of GMCSF and MCSF signaling but that HSC mobilization to the spleen by GCSF augments myeloid cell production.
Conclusions: Single cell resolution of complex intercellular signaling events revealed the dynamic events that coordinate neuroimmune and hematopoietic responses to stress that augment anxiety behaviors.

TIME: 14:10-14:25 **Session Speaker**

Microglia and its Functional Heterogeneity in Chronic Stress

Tian Li, PhD*; Sami Piirainen; Maria Piirsalu; Karen Odeh
Research Professor in Neuroimmunology, Institute of Biomedicine and Translational Medicine, Faculty of Medicine, University of Tartu, Estonia
Adjunct Professor, Neuroscience Center, University of Helsinki, Finland

We earlier have found that microglia from mice with high anxiety traits are more pro-inflammatory and prone to polarization from a CD206+ (M2-like) to a MHCII+ (M1-like) phenotype1, with differentially expressed genes involved in microglia-mediated synaptic plasticity2. Lately, we revealed the importance of regional specificity in microglial regulation of chronic neuropathic pain and associated affective behavior3, highlighting the importance of understanding microglial heterogeneity. Microglia have been shown to manifest temporal and spatial heterogeneities in their molecular and morphological features in the brain by several recent studies4, 5. Yet a clear functional interpretation of such heterogeneities remains elusive and microglia are still mostly regarded as either a holistic or at best polarized entities in the conditions of both brain development and diseases. This is particularly so in the studies of impacts of psychosocial stress on microglia. Microglia are sensitive to stress and their 'activation' has been mainly regarded as exacerbating stress response.
We are investigating features of microglial polarization and synaptic pruning in different brain regions across brain developmental stages as well as under the effect of chronic restraint stress in wild type C57BL/6 mice and CX3CR1KO mice by flow cytometry and confocal imaging together with behavioral tests. Our findings suggest that microglia heterogeneity is a multivariate phenomenon and region-specific changes in microglial synaptic modulation and CD206 polarization induced by chronic mild stress may help C57BL/6 mice adapt to the stress more actively, and microglial receptor CX3CR1 is important for such stress adaptation.

TIME: 14:25-14:40 **Session Speaker**

Neuronal Network Activity Controls Microglial Process Surveillance in Awake Mice via Norepinephrine Signaling

Long-Jun Wu, PhD; Yong Liu, PhD; Yujiao Li, MD, PhD; Ukpong B. Eyo, PhD, Anthony D. Umpierre, PhD; Tingjun Chen, MD, PhD; Dale B. Bosco, PhD
Associate Professor in Neurology, Neuroscience, and Immunology
Senior Associate Consultant II

Microglia are resident immune cells that dynamically survey the brain parenchyma. Microglial processes interact with neuronal elements, however, the role that neuronal network activity plays in regulating microglial dynamics is not entirely clear. Most studies of microglial dynamics have either utilized slice preparations or in vivo imaging in anesthetized mice. Here we demonstrate that microglia in awake mice have relatively reduced process area and surveillance territory. By contrast, reduced neuronal activity under general anesthesia increases microglial process velocity, extension and territory surveillance. Similarly, reductions in local neuronal activity via sensory deprivation or optogenetic inhibition increases microglial process surveillance. Using pharmacological and

chemogenetic approaches, we demonstrate that reduced norepinephrine signaling is necessary for the observed increases in microglial process surveillance. Thus, we reveal that noradrenergic tone in awake mice normally suppresses microglial process surveillance under basal physiological conditions. Our results therefore indicate the importance of awake imaging for studying microglia-neuron interactions and advance a "set point" theory for how neuronal activity influences microglial process dynamics.

TIME: 14:40-14:55 **Session Speaker**

An Intrauterine Inflammatory Challenge during Pregnancy Alters the Brain and Behavior of Exposed Offspring in a Sex-Dependent Manner

Teresa M. Reyes, PhD
Associate Professor, Pharmacology and Systems Physiology

Chorioamnionitis, or intraamniotic infection, is an acute inflammation of the membranes and chorion of the placenta, and can lead to adverse neurological outcomes for the developing fetus. To better understand how this early life exposure to an inflammatory challenge can alter brain development, we utilize a mouse model involving intrauterine delivery of lipopolysaccharide at E15 (IUI; intrauterine inflammation) and study behavioral, cellular and molecular consequences of IUI. In a series of studies, we have found that IUI-exposure leads to an increase in microglial cell count without changing the morphology of these brain-resident immune cells. In parallel, we also observe a decrease in white matter in both male and female IUI-exposed animals. Interestingly, when animals are challenged with LPS in adulthood, IUI exposed animals have a potentiated cytokine response in the brain, an effect observed only in males, but not females. To examine the effects of IUI on cognition, mice were trained in the 5 choice serial reaction time task, an operant task used to assess executive function (e.g., attention, impulsivity). At baseline, no differences between control and IUI animals were observed.
However, in response to an acute immune challenge (LPS administration), the IUI animals had a potentiated deficit in performance in this cognitive task. Across multiple behavioral assays, IUI animals showed an increase in locomotor activity. Collectively these data document significant effects of early life exposure to an immune challenge on brain development and behavior. Future studies will examine the role that microglia play in mediating the observed behavioral deficits.

TIME: 14:55-15:10 **Session Speaker**

Breast Cancer Hijacks the Brain to Impair Its Function

Adam K Walker, PhD
Director, Laboratory of Immunopsychiatry, Neuroscience Research Australia
Senior Lecturer, School of Psychiatry, University of New South Wales

Background: 70% of cancer patients report cognitive symptoms and 40% have measureable learning, concentration, and memory deficits. While these symptoms have long been attributed to chemotherapy, we have shown that the cancer itself is responsible. Here we interrogate the biological mechanisms responsible for tumour-induced cognitive impairment.
Method: We used syngenic orthotopic mouse models of metastatic breast cancer and examined memory using the novel object recognition test. Mice were injected with 4T1.2 or EO771 mammary adenocarcinoma cells (vs PBS) into the mammary fat pad. Bioluminescence imaging was used to track tumour progression and metastasis.
Result: Tumours induced memory impairment by releasing pro-inflammatory cytokines that cause neuroinflammation ($p < 0.05$) prior to metastasis and onset of sickness behaviours. Prophylactic use of the anti-inflammatory drug aspirin prevented tumour-induced memory impairment ($p < 0.05$). To determine if anti-inflammatories can reverse established tumour-induced memory impairment, mice were treated with aspirin (vs placebo) once memory impairment was established. Aspirin did not

reverse tumour-induced memory impairment, and did not affect cancer progression. It is plausible that pharmacological strategies are insufficient to eliminate tumour-induced peripheral inflammation. To determine if removing the tumour altogether reverses tumour-induced memory impairment we resected tumours either before or after metastasis. Despite primary tumour resection reducing peripheral inflammation, resection failed to reverse established memory impairment.
Conclusion: Solid peripheral tumours can hijack the brain to induce cognitive impairment preventable by anti-inflammatory drugs. However, strategies to eliminate tumour-induced inflammation may not be effective in treating cancer-associated cognitive impairment once cognitive impairment and neuroinflammation is established.

TIME: 15:10-15:25 **Session Speaker**

Chronic Ocular Pain: from Basic Research to Clinic

Annabelle Réaux-Le Goazigo, PhD
Institut de la Vision- Research Center – Sorbonne University-INSERM-CNRS
Team C. Baudouin-S. Melik Parsadaniantz « Chemokines and physiopathology of the eye anterior segment
Group Leader: "Neuroinflammation and Ocular Pain"

Ocular pain, in particular corneal pain, is considered a core symptom of inflammatory or traumatic disorders affecting the anterior segment of the eye. It increasing prevalence, morbidity, and the resulting social burden has caused chronic ocular pain to be recognized as a serious public health issue. To date, the management of chronic corneal pain still represents a therapeutic challenge in ophthalmology. A better understanding of the molecular and cellular mechanisms involved are crucial issues for developing effective management and therapeutic strategy to alleviate this debilitating condition.
Here we provide new information about the peripheral and central neuroinflammatory process in the trigeminal pathways in response to cornea alteration in preclinical models of corneal pain. We reported that altered activity in intracellular signaling (Fos, Iba1 and p38 MAPK activation) caused by ocular inflammatory pain might play a priming role in the central sensitization of ocular related brainstem circuits.
In addition to this fundamental research, we have conducted a clinical study on the ocular surface of patients with ocular pain symptoms to quantify corneal nerve density and its relation with corneal inflammation. Conjunctival impression cytology analysis revealed that proinflammatory markers (HLA-DR, IL-6, CXCR4 and CCL2/CCR2 mRNA levels) were significantly increased in patients with ocular pain compared to healthy subjects.
To conclude, a better understanding of the sequence and nature of the events that drive these molecular mechanisms will offer significant promise for the discovery of new mechanisms and targets for the management of chronic ocular pain.

S14. GLYMPHATIC SESSION

TIME **Mon 7 Oct. 2019 16:00-17:45**

Location **International Lecture Hall**

Chances and Difficulties of Understanding the Neuroimmunology of Severe Mental Disorders

Moderator:
Bechter Karl, MD, PhD
Retired clinician, researcher University of Ulm, Germany
Su Huanxing, MD, PhD
Associate Professor, Institute of Chinese Medical Sciences, University of Macau

Karl Bechter will provide an overview about the development and relevance of the Mild Encephalitis (ME) hypothesis, based on animal models of Bornavirus infection and compiled findings in humans with regard to the potential role of various infections and related/triggered autoimmune ME in severe psychiatric diseases and the road to a first international consensus about autoimmune psychosis, fulfilling in principle the proposed ME criteria.|

Huanxing Su, from University of Macau, Macau, will describe an enhanced effective Aβ clearance pattern for the treatment of CAA. With two-photon microscopy and histopathological analysis, we revealed that intrathecally injected AAV-sNEP transfect meningeal cells and adventitial and smooth muscle cells of leptomeningeal and penetrating vessels, sufficiently generate soluble sNEP to rapidly and efficiently degrade perivascular Aβ deposits and improve impaired spatial learning and memory function in a mouse model with CAA. Our study suggests that intrathecal AAV mediated NEP could be a promising therapeutic strategy for CAA.

Yung Chang, PhD, Bio-inspired Molecular Design for Healthcare Impacts | R&D Center for Membrane Technology, Chung Yuan University, Taiwan

Dominique Endres, from the University Medical Center Freiburg, Department of Psychiatry and Psychotherapy, Germany , will present the revolutionary new approach to diagnosis and treatment of Autoimmune Psychosis and demonstrate and discuss these extraordinary succesfull new treatment in several detailed single case presentations including video material (English translation of patients examinations in written subtitles).

Souhel Najjar, from the Department of Neurology, Lenox Hill Hospital, New York, USA , will outline the many diagnostic and therapeutic Dilemmas inherent to neuropsychiatric disorders of suspected immune origin, discussing the role oft he neurovascular unit and the present considerable limitations of diagnostic methods available for mild neuroinflammation, necessitating the use of brain biopsy in some cases. He treated under others the now publicly reknown case of psychosis in a young journalist (see S. Cahalan, Brain on Fire).

TIME: 16:00-16:30 **Session Keynote**

Mild Encephalitis and autoimmune psychosis - from hypothesis to first international consensus

Karl Bechter, MD, PhD
Retired clinician, researcher University of Ulm, Germany

Background: From background of own longstanding research on the potential role of Bornavirus, a strongly neurotropic virus causing the most frequent type of meningoencephalitis in horses and sheep in Middle Europe, in the etiology of neurological and psychiatric disorders in humans the Mild Encephalitis (ME) hypothesis was developed, which proposed ME to present clinically with various symptoms of severe psychiatric disorders but without neurological hard signs, the psychiatric syndrome being caused by mild neuroinflammation (Bechter, NPBR, 2001).
Methods: Review about the emerging findings to support the ME hypothesis for a subgroup of severe psychiatric disorders caused or triggered by various infections and potentially related to or triggering autoimmune neuroinflammation.
Results: Three major models of potential human Bornavirus infection appeared plausible (Bechter 1998): 1. a type of acute or subacute classical meningoencephalitis with typical neurological symptoms. 2. an ME type of classical virus encephalitis but presenting with exclusive psychiatric symptoms. 3. a type of Bornavirus-induced autoimmune ME presenting with exclusive psychiatric symptoms, clinically appearing rather similar as type 2.
Our compiled research findings from our endemic region (Southern Germany) suggested, that up to 3% of severe psychiatric disorders in clinical inpatient population under age 50 and few cases of classical viral meningoencephalitis with typical neurological syndrome might be causally related to Bornavirus infection.
The idea to consider the Bornavirus model as a template for other unknown infectious and/or autoimmune ME with similar outcome with regard to clinical syndromes elicited, is supported by an emerging bulk of epidemiologic and clinical findings, though remains still elusive (Bechter, Progr NP&BP, 2013).
Conclusions: A first international consensus on the diagnosis and treatment of a type of Autoimmune Psychosis, fulfilling the proposed ME criteria, was based on clinical and autoantibodies findings and case series successfully treated by immune modulation (Pollak et al, Lancet Psychiatry, in press).

TIME: 16:30-16:45 **Session Speaker**

Intrathecal AAV9-mediated delivery of neprilysin protects against perivascular amyloid-β accumulation and improves cognitive deficits in a mouse model of cerebral amyloid angiopathy

Huanxing Su, MD, PhD
Associate Professor, Institute of Chinese Medical Sciences, University of Macau

Background: Targeting Amyloid-β (Aβ) accumulation seems a promising strategy for the treatment of cerebral amyloid angiopathy (CAA) and Alzheimer's disease (AD). However, a safe and efficient brain-wide perivascular Aβ clearance is still challenging.
Methods: In this animal study, we used male C57BL/6J mice (8-12 weeks of age), APP/PS1 double-transgenic mice (AD, 7–9 months old) and Tg-SwDI transgenic mice (CAA, 4 months old) subjected to intrathecal injection of AAV9 vectors encoding a soluble form of NEP (NEP-s). Two-photon imaging was used to visualize if AAV9-NEP-s could substantially enter the brain parenchyma. Behavioural analysis followed by brain pathology analysis was conducted. To further validate the effects of AAV9-NEP-s treatment, western blot and ELISA analysis were performed to analyse specific markers.
Results: Using intrathecal injected adeno-associated virus 9 (AAV 9) mediated neprilysin (NEP), we showed that AAV-NEP-s could reduce Aβ accumulation and improve cognitive deficits both in Tg-SwDI and APPswe/PS1dE9 (APP/PS1) transgenic mice. Meningeal cells, adventitial cells and smooth muscle

cells in leptomeningeal arteries and penetrating arterioles could be transfected by intrathecal injected AAV9-NEP-s, and hence generating sufficient soluble NEP to exert beneficial effects by perivascular Aβ clearance, protecting smooth muscle cells from damage and pericyte from loss, maintaining the BBB integrity, and eventually improving cognitive decline in Tg-SwDI mice. Furthermore, intrathecal AAV9-mediated NEP-s could efficiently enter the brain interstitium via periarterial spaces and degrade extracellular Aβ deposits and improve cognitive decline in APP/PS1 transgenic mice.
Conclusion: The results of the present study provide evidence that intrathecal AAV mediated sNEP could be a promising therapeutic strategy for clearance of Aβ accumulation in the treatment of CAA and AD

TIME: 16:45-17:00 **Session Speaker**

Neuronal Network Activity Controls Microglial Process Surveillance in Awake Mice via Norepinephrine Signaling

Yung Chang, PhD
Director, R&D center for membrane technology, Chung Yuan Christian University, Taiwan
Distinguished Professor, Department of Chemical Engineering, Chung Yuan Christian University, Taiwan

Bio-inspired zwitterionic macromolecules are the latest generation of medical materials for bio-inert interfaces and membranes. Zwitterionic molecules can form tighter bonds with water molecules and can trap more water molecules. This talk summarizes our laboratory's fundamental developments related to the functionalization of interfaces and membranes using zwitterionic moelcules. Our molecular designs of zwitterionic macromolecules (polymers and copolymers), sulfobetaine-based, carboxybetaine-based, or phosphobetaine-based, will be reviewed. Then, the strategies used to functionalize surfaces/membranes by coating, grafting onto, grafting from, or in situ modification will be introduced, and the important part of this talk will be the focus to key medical applications of zwitterionic membranes. Finally, some potential future directions for molecular designs, functionalization processes, and applications will be summarized in this talk

TIME: 17:00-17:15 **Session Speaker**

Diagnosis and Treatment Approaches to Autoimmune Psychosis - Discussion and Single Cases Presentations

Dominique Endres, MD
Senior physician (psychiatrist)
Head of the working group for"Immunological Encephalopathies" from the University Medical Center Freiburg, Department of Psychiatry and Psychotherapy, Germany

Over the last ten years, the discovery of anti-NMDA receptor encephalitis and other autoimmune encephalitides has opened a new clinically highly-relevant field of brain disorders. Initially, it was assumed that autoimmune encephalitis always manifests neurologically, but we and other researchers were able to publish several cases of autoimmune encephalitis that mimicked classical psychiatric syndromes, with the majority being psychosis. Therefore, the term autoimmune psychosis has been suggested for these patients by some authors. Different subgroups of patients with autoimmune psychosis with either antineuronal antibodies against the cell surface or intracellular antigens can be distinguished as well as patients with underlying Hashimoto encephalopathy or neuropsychiatric systematic lupus erythematosus. In the presentation, pathophysiological processes, such as direct antibody effects, will be discussed. In addition, clinical signs of autoimmune pathophysiology will be presented as well as typical diagnostic findings in cerebrospinal fluid analyses, magnetic resonance imaging, electroencephalography and [18F] fluorodeoxyglucose positron emission tomography. In particular, the role of cerebrospinal fluid diagnostics and antibody

investigations will be shown. Finally, diagnostic experiences and clinical courses will be discussed.

TIME: 17:15-17:30 **Session Speaker**

Diagnostic and Therapeutic Dilemmas Inherent to Neuropsychiatric Disorders of Suspected Immune Origin, It's All One Brain

Souhel Najjar, MD

Founder and Director of Autoimmune Brain Disorder and Autoimmune Encephalitis Center, Lenox Hill Hospital
Chairman of Neurology, Lenox Hill Hospital, NY
Chairman of Neurology, Staten Island University Hospital, NY
Professor and Chairman, Department of Neurology, Donald and Barbara Zucker School of Medicine at Hofstra/Northwell
Executive Director and Senior Vice President of Northwell Health Neurology Service Line

Growing human and experimental data suggest that inflammation, immune dysregulation, and autoimmunity can contribute to the neurobiology, severity, and progression of subgroups of psychiatric disorders, including first-episode psychosis and schizophrenia according to the currently established DSM/ICD criteria. These aberrant immune and inflammatory responses may contribute not only to the pathophysiology of psychiatric and behavioral disturbances, but also to the concurrent cognitive deficits, soft neurological signs, and autonomic abnormalities. Furthermore, these changes can also contribute to the refractoriness of psychiatric disorders to the conventional treatments. Recent data support the existence of autoimmune psychosis as a distinct entity. Here, we present the current challenges inherent to the diagnosis and management of clinically suspected immune or inflammation–mediated isolated CNS disorders presenting with dominant psychiatric features, with emphasis on new-onset seronegative psychosis of suspected immune origin (seronegative autoimmune psychosis) mimicking primary psychosis.

PLENARY KEYNOTE SPEECH 3

TIME **09:20-10:00, Mon 8 Oct. 20190**

Location **International Lecture Hall**

Moderator: Chon-Haw Tsai, MD, PhD

Dean, College of Medicine, China Medical University, Taiwan
Professor and Director, Department of Neurology, China Medical University Hospital, Taiwan

The application of compound specific isotope ratio analysis to study polyunsaturated fatty acid metabolism in rodents and humans: Teaching an old technology new tricks

Richard Bazinet, PhD
Associate Professor, Department of Nutritional Sciences, University of Toronto, Canada
Canada Research Chair in Brain Lipid Metabolism
President, ISSFAL

Collectively polyunsaturated fatty acids (PUFA), especially eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) regulate many functions and there has been much interest in how plasma and tissue levels are maintained. Interestingly, supplements rich in EPA have been extensively liked to improvements in major depression when the content of DHA is low, but not when DHA is relatively high. Unfortunately, the study of PUFA often requires expensive tracers which are given as a single dose and evaluated over a short period of time. Recently, we have taken advantage in the natural variation of carbon 13 in lipids by using compound specific isotope analysis (CSIA) via gas-chromatography, isotope ratio mass spectrometry. In rodents, we observed that natural variations in the carbon 13 content of PUFA derived from marine sources can be used to differentiate tissue docosahexaenoic acid (DHA) derived directly from the diet or synthesised from terrestrial precursors. Then, in humans we reported the EPA can supply plasma DHA. Furthermore, we reported, that while dietary DHA increases EPA, that this is not occurring via “retroconversion”, but rather by creating a backlog in the synthesis pathway which highlights novel EPA/DHA interactions. Within two years of applying CSIA to the study of fatty acids in rodents, we were able to confirm several of our basic observations in humans. In summary, CSIA analysis can be applied to study PUFA metabolism both rodent and human fatty acid metabolism.

S21. NUTRITIONAL PSYCHIATRY SESSION

TIME **10:00-12:10 Mon 8 Oct. 2019**

Location **International Lecture Hall**

Omega-3 Fatty Acids in Management of Depression and Anxiety: From Making Evidence to Dissemination to Practice

Moderator:
David Mischoulon, MD, PhD

Director, Depression Clinical and Research Program, Massachusetts General Hospital
Joyce R Tedlow Professor of Psychiatry, Harvard Medical School

A growing body of evidence has highlighted a role of omega-3 polyunsaturated fatty acids (n-3 PUFAs) in psychiatric practice. Randomized clinical trials of n-3 PUFAs are increasing in number in the past decade in diverse indications, notably mood disorders and anxiety disorder with varying levels of evidence base. Here, we summarize the current evidence of n-3 PUFAs and sheds some light on the future direction in practice and research. Professor Mischoulon provides some historical background about omega-3 in psychiatric practice. Then he presents data from a new dose-finding clinical trial examining clinical efficacy and possible biological mechanisms of action of n-3 PUFAs for depression. Dr. Guu presents a literature review of n-3 PUFAs in the treatment of depression and a result of subsequent Delphi-process for developing a consensus-based practice guideline of n-3 PUFAs in MDD treatment. Professor Matsuoka presents the findings of meta-analysis that evaluated the anxiolytic effects of n-3 PUFA treatment compared with controls in varied populations. And he describes the necessity to conduct more researches of n-3 PUFAs for anxiety. Finally Dr Chang summarizes the current best evidence and limitation of n-3 PUFAs in psychiatric practice and discusses the necessity of high quality clinical research, making practice guideline and dissemination strategy for using n-3 PUFAs as a treatment option for depression and anxiety.

TIME: 10:00-10:30 **Session Keynote**

Current Role of Natural Remedies in Psychiatry and Possible Mechanism of Omega-3 Fatty Acids

Karl Bechter, MD, PhD*, Boadie Dunlop, MD, Becky Kinkead, PhD, Pamela Schettler, PhD, Stefania Lamon-Fava, MD, PhD, Andrew A Nierenberg, MD, Jennifer Felger, BA, Alisabet J Clain, MS, Tanja Mletzko, BA, Andrea Wong, BA, Garrett Thomas, BA, Lisa Sangermano, BA Thomas Ziegler, MD, Maurizio Fava, MD, Mark H Rapaport, MD
Director, Depression Clinical and Research Program, Massachusetts General Hospital
Joyce R Tedlow Professor of Psychiatry, Harvard Medical School

Background: The omega-3 (n-3) eicosapentaenoic acid (EPA) may be effective for overweight depressed individuals with elevated inflammation. We compared an EPA-enriched preparation versus placebo as monotherapy for overweight adults with major depressive disorder (MDD) and elevated c-reactive protein (CRP).
Method: We randomized 61 adults with MDD, body mass index (BMI)>25, and plasma hs-CRP ≥3.0 equally to 3 EPA regimens (1 g/day, 2 g/day, 4 g/day) or placebo for 12 weeks. We assessed response (≥50% decrease in IDS-C30 scores), plasma hs-CRP, interleukin (IL)-6, tumor necrosis factor (TNF)-α; peripheral blood mononuclear cell (PBMC) IL-6, TNF-α, TNF-α gene expression, and IL-6 gene expression. A ≥25% decrease was considered biologically meaningful.
Result: For 48 completers, response rates were 69% for EPA 4g/day (odds ratio [OR]= 3.37, Cohen's d=0.67 vs placebo), 36% for 1 g/day and 2 g/day, and 40% for placebo. EPA produced greater rates of ≥25% reduction of hs-CRP than placebo (2g/d, OR=4.00, d=0.76; 4 g/d, OR=3.43, d=0.68). The 25% IL-6 reduction threshold was lower for all EPA than for placebo. For PBMC IL-6, OR ranged from 2.22-2.67 for all EPA vs. placebo (d=0.44-0.54). IL-6 gene expression exceeded placebo most at 4

g/day (OR=8.17, d=1.16; OR=4.20, d=0.79 for 1 g/day and 2 g/day). Plasma TNF-α reduction was higher (9-15%) in all EPA than placebo (0%). PBMC TNF-α and TNF-α gene expression favored EPA 1g/day and 2g/day only.
Conclusion: Higher EPA doses (4 g/day) may be more effective for depression, and improvement may be mediated by inflammatory biomarkers. Replication in larger samples is necessary.

TIME: 10:30-10:50 **Session Speaker**

Association of Use of Omega-3 Fatty Acids with Changes in Severity of Anxiety Symptoms: A Systematic Review and Meta-analysis

Yutaka Matsuoka, MD, PhD
Division Chief of Health Care Research, Behavioral Sciences and Survivorship Research Group, Center for Public Health Sciences, National Cancer Center Japan
Professor of Lifestyle Medicine, Cooperative Graduate Program, The Jikei University Graduate School of Medicine

Background: No systematic review or meta-analysis has assessed the efficacy of omega-3 polyunsaturated fatty acids (PUFAs) for anxiety. We evaluated the anxiolytic effects of omega-3 PUFA treatment compared with controls in varied populations.
Methods: Clinical trials assessing the anxiolytic effect of omega-3 PUFAs in humans, either in placebo-controlled or non-placebo-controlled designs were searched up to March 4, 2018. Out of 104 selected articles, 19 entered the final data extraction stage. Two authors independently extracted the data according to a pre-determined list of interests. We performed a random-effects model meta-analysis and conducted this study based upon PRISMA guidelines. The main outcomes were set as the changes in the severity of anxiety symptoms after omega-3 PUFA treatment.
Results: In total, 1203 participants with omega-3 PUFA treatment and 1037 participants without omega-3 PUFA treatment revealed that omega-3 PUFA improved clinical anxiety symptoms compared with control arms (Hedges' g = 0.374, 95% confidence interval = 0.081 to 0.666, p = 0.012). Subgroup analysis showed that the treatment effects were significantly better in subgroups with specific clinical diagnoses than in subgroups without clinical conditions. The anxiolytic effect of omega-3 PUFAs was significantly better than that of controls only in subgroups with a higher dosage (at least 2 g/day) and not in subgroups with a lower dosage (less than 2 g/day).
Conclusion: Our review indicates that omega-3 PUFAs might help to reduce the symptoms of clinical anxiety. Further well-designed studies are needed in populations where anxiety is the main symptom.

TIME: 10:50-11:10 **Session Speaker**

Utilizing the Delphi process for expert consensus of using omega-3 polyunsaturated fatty acids in the treatment of major depressive disorder

Ta-Wei Guu, MD
Attending physician, Division of Psychiatry, Department of Internal Medicine, China Medical University Beigang Hospital
Chief of Education Division, Department of Education and Research, China Medical University Beigang Hospital

Background: Omega-3 polyunsaturated fatty acids (N-3 PUFAs), especially EPA and DHA, have been used to treat major depressive disorder (MDD) with growing biological and clinical evidence. We aimed to establish a consensus on clinical application through a Delphi process.
Method: A sub-committee of the International Society for Nutritional Psychiatry Research (ISNPR) formulated nineteen statements regarding clinical application of N-3 in MDD. Fourteen experts in the field of N-3 and depression, including clinicians and academics, participated in the web-based Delphi process and validated the statements. A Likert scale (0 to 10) was used for the statements (0 = fully against, 10 = fully agree). "Consensus" was predefined as 7.0/10, "equivocal" between 5.1-6.9, and < 5.0 led to allocation into a second-round survey with inverse questions.
Results: All fourteen experts completed the survey in 2 weeks. Sixteen out of nineteen statements scored above the threshold. The three "equivocal" questions were: "N-3 PUFAs are one of the

potential monotherapies for adult MDD," "pure EPA is more recommended than EPA/DHA (>2) combination," and "N3-PUFAs are considered similarly effective for recurrent MDD, compared with treatment-naïve MDD, as an adjunctive treatment." Statements that reached consensus were synthesized into a guideline, covering 5 domains in MDD treatment, including "general concepts," "prescription strategy," "recurrence monitoring and prevention," "safety" and "special populations."
Conclusion: Using the Delphi process, international experts from the ISNPR sub-committee validated practical statements and achieved a consensus to develop the practice guideline of N-3 PUFA in the treatment of MDD.

TIME: 11:10-11:30 **Session Speaker**

Strategies of Dissemination, Communication, and Raising Awareness of the Benefits of Omega-3's in Mental Health

Cherry Hui-Chih Chang, PhD
Senior Lecturer, Mind-Body Interface Center, China Medical University Hospital, Taichung, Taiwan
Secretary-General, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

Background: Mental illness, like depression, is known for its heterogenous nature, which has hindered progress in treatment and research for the past decades. With the recent advance of nutritional psychiatry research, health benefits of omega-3 polyunsaturated fatty acids (PUFAs) have been recognized and considered as a promising treatment by clinicians in Taiwan. Founded in 2016 by researchers and clinicians, the Taiwanese Society for Nutritional Psychiatry Research (TSNPR) aims to bridge the gap between bench and bedside. We will present experience on how to advocate nutritional medicine as the mainstream of psychiatry, to raise the awareness of integrative medicine and to facilitate evidence-based practice in the field of mental health, with the model of omega-3 PUFAs.
Method: Effective communication proposals have been developed by the executive board, ensuring that all communications speak to the core objectives of the agreed dissemination strategy and that key messages are consistently delivered to our targeted audience, the practitioners and researchers. Key outcome results will be monitored on a regular basis, and evaluation will take place annually.
Result: The communication plan and the activities conducted will be presented with outcomes measured.
Conclusion: Strategies of dissemination and raising awareness of omega-3's benefit in mental health have been developed to target audiences (health professionals, scientific and educational community members, and the general public). The strategy will be reviewed and adapted, to better suit the needs and the latest opportunities offered in the future.

TIME: 11:30-11:50 **Session Speaker**

Dietary Intake of Fish and N-3 Polyunsaturated Fatty Acids and Risk of Postpartum Depression: A Nationwide Longitudinal Study – The Japan Environment and Children's Study (JECS)

Kei Hamazaki, MD, PhD
Associate ProfessorUniversity of Toyama, Toyama city, Japan

Background: Pregnant women require increased levels of n-3 polyunsaturated fatty acids (PUFAs) due to the demands of the growing fetus. Although evidence indicates a relationship of maternal intake of fish and n-3 PUFAs with a reduced risk of postpartum depression, the results are not consistent.
Methods: We investigated whether dietary consumption of fish and/or n-3 PUFAs during pregnancy is associated with a reduced risk of maternal postpartum depression at 6 months after delivery and of serious mental illness at 1 year in a Japanese population. After exclusion and multiple imputation from a dataset comprising 103,062 pregnancies obtained in the Japan Environment and Children's Study, we evaluated 84,181 and 81,924 women at 6 months and 1 year after delivery, respectively.

Results: Multivariable logistic regression showed a reduced risk of postpartum depression at 6 months in the second to fifth quintiles vs. the first quintile for fish and n-3 PUFA intake, with trend tests also revealing a significant linear association. At 1 year after delivery, fish intake was associated with a reduced risk of serious mental illness in the second to fifth quintiles vs. the first quintile for fish and in the third to fifth quintiles vs. the first quintile for n-3 PUFA intake, with trend tests also revealing a significant linear association.
Conclusions: Women with higher fish and/or n-3 PUFA intake showed reduced risk of postpartum depression at 6 months after delivery and of serious mental illness at 1 year after delivery. The association was strongest between fish intake and risk of serious mental illness.

S22. REBAMP SPONSORED SESSION

TIME **12:20-13:00, Mon 8 Oct. 2019**

Location **Windsor Square**

Moderator:
Lee Yan Sheen, PhD
Distinguished Professor, Institute of Food Science and Technology, National Taiwan University
Director, National Center for Food Safety Education & Research, National Taiwan University
Hua-Hsuan Tseng, MD, PhD
Attending Psychiatrist & Assistant professor, Department of Psychiatry, College of Medicine, National Cheng Kung University;
Assistant Professor (joint appointment), Institute of Behavioral Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan

TIME: 12:20-12:30 **Session Speaker**

Social media addiction: why it's bad for mental health and relationships?
Chotpitayasunondh Varoth, MD, PhD
Psychiatrist, Sritanya Psychiatric Hospital, Department of Mental Health
Deputy Director, Bureau of Mental Health Academic Affairs, Department of Mental Health

Since the past decade, communication technology has revolutionized everyone's daily life and has also disrupted how people interact with each other in general. Social media, the interactive websites that allow people to express and share information on the internet using, have changed the way people maintain friendships and intimate relationships in modern society. Comparing to many previous forms of communication, social media socialization can enrich interactions by providing better control in sharing of ideas, interests, conversations, identities, reputations, and information over both the degree of privacy and size of socialized group. While social media are becoming a way of life and personal activities of human, however, there has been increasing concern that they are often used inappropriately which can impact family, social, and psychological functioning. Research into various online addictions, including social media addiction, has greatly increased over the past few years. Even though, social media addiction is not yet officially recognized as a mental disorder in the standard classification, the exponential growth of statistics in social media worldwide has been triggering researchers' interest in investigating this emerging phenomenon. Therefore, this oral presentation is intended to provide empirical and conceptual insight into the phenomenon of social media addiction, phubbing behaviour, and its impact on mental health and relationship aspect of users' lives.

TIME: 12:30-12:40 **Session Speaker**

Efficacy and Acceptability of Varenicline for Alcoholism: A Systematic Review and Meta-Analysis of Randomized-Controlled

Awirut Oon-arom, MD, FRCPsychT
Research FellowDepartment of Psychiatry, Faculty of Medicine, Chiang Mai University

Background: Current pharmacological treatment for alcoholism remains unsatisfactory. While there have been several clinical trials investigating the efficacy and safety of varenicline in alcoholism, no high-quality review in this topic has been carried out. This systematic review aimed to determine the efficacy and acceptability of varenicline in alcoholism.
Methods: This systematic review included double-blinded, randomized, placebo-controlled trials reporting heavy drinking days, amount of alcohol consumption, overall dropout, or dropouts due to adverse events. We searched PubMed, Scopus, Web of Science, ClinicalTrials.gov, and the Cochrane Library in January 2019. We independently selected the trials and assessed the quality of included studies. We calculated standardized mean differences on heavy drinking days, amount of alcohol intake. We computed the relative risks for dropouts using random-effects models.
Result: This systematic review included nine double-blind, randomized, placebo-controlled trials (N=585). The study duration was ranged from 2 to 13 weeks. Varenicline therapy was marginally superior to placebo in decreasing heavy drinking days and significantly superior to placebo in decreasing alcohol intake. There were no significantly difference between groups on dropouts for any reasons and dropouts due to adverse events.
Conclusion: Varenicline therapy is effective for decreasing alcohol intake and might able to decrease heavy drinking days in patients with alcoholism. It is a well-accepted pharmacological treatment for alcoholism. More studies are needed to determine if varenicline is effective in decreasing heavy drinking.

TIME: 12:40-12:50 **Session Speaker**

Pharmacological strategy in regulating Glymphatic function

Senthil Kumaran Satyanarayanan, PhD*, Dr. Qiang Liu, Dr, Huixia Ren, Ms. Lingli Yan, Ms. Miaodan Huang, and Dr. Huanxing Su
Post Doctoral FellowUniversidade de Macau, Macau

Background: Recent revelations about the impairment of glymphatic function in aging and Alzheimer's disease (AD) have prompted a fresh lookout for some pharmacological strategies in restoring its function. Strategies that can promote amyloid-β clearance from the brain hold a great promise in delaying or preventing the onset of AD. Here, we demonstrated that n-3 polyunsaturated fatty acids (PUFAs), by use of fat-1 transgenic mice and oral administration of fish oil significantly promote interstitial Aβ clearance from the brain and resist Aβ injury, whereas, the glymphatic function in the brain was impaired by alcohol administration in C57BL/6J mice.
Methodology: In the animal study, we would use male fat-1 transgenic mice and C57BL/6J mice subjected to n-3 PUFAs and alcohol treatment with three parallel groups. Group1 received fish oil containing 52.4% docosahexanoic acid (DHA) was given to adult male C57BL/6 mice (30 mg/kg weight) through daily oral gavage for 3 weeks. Group 2 mice were injected with 2.0 g/kg which was dissolved in saline with the volume of 1.0 mL/100 g of body weight for acute treatment, whereas, group 3 mice were injected with 2.0 g/kg/day alcohol (20% v/v in saline) for 4 consecutive weeks for chronic alcohol treatment respectively. Two-photon imaging was used to investigate further effects of n-3 PUFAs and alcohol treatment.
Result & Conclusion: Acute moderate alcohol administration impaired CSF-interstitial fluid (ISF) exchange and parenchymal amyloid β (Aβ) peptide clearance accounting for impairment of the glymphatic function. Chronic moderate alcohol consumption led to an irreversible impairment of the glymphatic function by activation of astrocytes and a widespread loss of perivascular AQP4 polarization in the brain. Interestingly, both endogenous and exogenous n-3 PUFAs promoted Aβ clearance from the brain by inhibiting the activation of astrocytes and protecting the AQP4

polarization after Aβ injury. The results of the present study provide evidence for the first time that pharmacological agents could regulate the function of the brain clearance system, n-3 PUFAs exert beneficial effects via activating the Aβ clearance system in the brain and alcoholism may contribute to impaired glymphatic function and reduced parenchymal Aβ clearance contributing to further development of cognitive decline and dementia.

TIME: 12:50-13:00 **Session Speaker**

Depression-free after Interferon-α (IFN-α) Exposure Indicates Less Incidence of Depressive disorder: A Population-Based

Ching-Fang Sun, MD

Medical studentCollege of Medicine, China Medical University, Taichung, Taiwan

Background: IFN-α-induced depression, as an adverse effect of hepatitis C virus (HCV) treatment, gained attention because it served as an ideal model for the inflammation hypothesis of depression. While most studies focused on the prevention and treatment for depressive symptoms during IFN-α-based therapies, there is no study on HCV patients receiving IFN-α without developing a neuropsychiatric disorder. In contrast to IFN-α-induced depression with a high recurrent rate, we assumed that not developing depression even exposed to IFN-α might be a protective factor against depressive disorder. The aim of this study is to reveal the correlation between depression-free after IFN-α exposure and the incidence of depressive disorder.

Methods: We conducted a twelve-year population-based cohort study of hepatitis C virus (HCV)-infected patients who were older than 20 years and had received IFN-α therapy. The sample was obtained from the Taiwan National Health Insurance Research Database. The cohort included patients without any depressive disorder nor antidepressant use during IFN-α therapy, matched randomly by age, sex income and urbanization, at a ratio of 1:4 with the HCV cohort without IFN-α therapy. The follow-up started after the last administration of IFN-α and was designed to determine the incidence of depressive disorder after IFN-α therapy.

Results: A total of 20,468 subjects were identified as having no IFN-α-induced depression records. The overall incidence of new-onset depressive disorders among patients without IFN-α-induced depression and control cohort was 126.8 (95% CI, 118.5-135.6) and 145.2 (95% CI, 140.0-150.6) cases, respectively, per 10,000 person-years, $p < 0.001$. The crude hazard ratios for incident depressive disorder was 0.87 (95% CI, 0.80-0.87) and the adjusted hazard ratios was 0.79 (95% CI, 0.72-0.87) after adjusting for age, sex, income, urbanization and comorbid diseases.

Conclusions: Compared with the HCV infected population, patients without depression after IFN-α exposure were less likely to develop a mood disorder in later life. Our study might inspire a new direction for developing pharmacological prophylaxis strategy against depression.

PLENARY KEYNOTE SPEECH 4

TIME **13:00-13:40 Mon 8 Oct. 2019**

Location **International Lecture Hall**

Moderator: Ying Chieh Tsai, PhD

Professor, Institute of Biochemistry and Molecular Biology, National Yang-Ming University, Taiwan
President of Taiwan Association of Lactic Acid Bacteria

Contributions of Microbial Metabolism to the Gut-Brain Axis and Bacterial Sulfur Metabolism to Colorectal Cancer

H. Rex Gaskins, PhD
Keith W. and Sara M. Kelley Professor of Immunophysiology
Associate Director for Education, Cancer Center at Illinois

First, an overview will be presented of current state of knowledge regarding contributions of various modes of microbial metabolism to the gut-brain axis in health and disease. This will be followed by a focus on our own work examining the extent to which bacterial-derived hydrogen sulfide may serve as a proinflammatory and genotoxic insult that modifies colon cancer risk. Data will be presented which demonstrate that the human colonic mucosa is persistently colonized by bacteria capable of generating sulfide from both inorganic and organic sulfur sources along with evidence that sulfide activates molecular pathways that underlie epithelial inflammation and hyperplasia, a phenotype common to both ulcerative colitis and colorectal cancer. Published studies will also be summarized, which demonstrate direct free radical based genotoxicity by exogenous sulfide that is independent of host cell metabolism. These observations highlight the possible role of bacterial-derived sulfide as a colonic insult that, together with a predisposing genetic background, may lead to genomic instability or the cumulative mutations characteristic of colorectal cancer.

S23. PNIRSASIA-PACIFIC SESSION (II)

TIME **13:40-15:30 Mon 8 Oct. 2019**

Location **International Lecture Hall**

Microbiome, Lifestyle and Neuropsychiatry

Chair & Moderator: Keith W. Kelley, PhD

Professor Emeritus of Immunophysiology, University of Illinois, USA
Editor-in-Chief of Brain, Behavior, and Immunity

The Psychoneuroimmunology Research Society (PNIRS) has a global presence in promoting the discovery of new knowledge about interactions between the nervous and immune systems and their relationships with behavior and health. By focusing on the fundamental integrative physiology of reciprocal relationships between the immune system and brain, these scientists are changing the face of immunology and neuroscience, and more recently the gut. Inflammation is no longer taught in medical schools as only a local regional process with the classic symptoms of rubor (redness), calor (heat), dolor (pain), tumor (swelling) and loss of function. In its place, the concept of chronic, systemic inflammation is now recognized as a major factor in costly diseases such as cardiovascular, metabolic and mental health disorders. In this PNIRSAsia-Pacific-sponsored symposium, nine scholars from four continents will highlight some of their newest pre-clinical findings on the role of microglia in synaptic surveillance (Wu), stress (Tian) and their potential involvement in behavioral abnormalities associated with inflammation during neonatal development (Reyes). The impact of chronic stress on myelopoiesis, monocyte recruitment into the CNS and anxiety behavior will be presented (McKim). The emerging role of diet on interactions among the immune system, gut and brain will be highlighted by three experts. These talks will focus on caloric restriction (Kent), n-3 polyunsaturated fatty acids (Song) and signalling mechanisms across the gut and the blood-brain barriers (Konsman). New findings will be presented that suggest chronic ocular inflammatory pain primes ocular-related brainstem circuits (Réaux-Le Goazigo). Finally, the underpinnings of breast cancer-induced cognitive impairment as assessed by anti-inflammatory treatment will be presented (Walker). The collective theme of these lectures will reinforce and extend the concept of the importance of reciprocal communication between the immune and central nervous systems.

TIME: 13:40-14:10 **Session Keynote**

Should we all eat less? Behavioural, endocrine, and immunological consequences of calorie restriction

Stephen Kent, PhD *, MacDonald, L, Radler, M, Paolini, AG, Hale, MW
Professor and Head of School Psychology & Public Health

Calorie restriction (CR) has been shown to increase longevity and elicit many health promoting benefits including delaying immunosenescence and attenuating neurodegeneration in animal models of Alzheimer's disease and Parkinson's disease. However, the mechanisms underlying these effects are unknown, but a decreased inflammatory state may be a contributor. Data presented in this talk will highlight how reduced food intake (50% for 28 days), which still meeting the RDAs for all vitamins and minerals, reduces anxiety-like behaviour, increases social behaviour, alters sexual selection, changes endocrine levels, and shifts hypothalamic signaling pathways to an anti-inflammatory bias. This results in an attenuated fever and sickness response to lipopolysaccharide (LPS), the active fragment of Gram negative bacterial cell walls. Associated with this attenuated immune response are increases in anti-inflammatory compounds (e.g., corticosterone, NPY, interleukin-10) and decreases in pro-inflammatory compounds (e.g., cyclooxygenase-2, interleukin-6, leptin). Our most recent work has focused on the ability of CR to attenuate microglial activation primarily in the arcuate nucleus and ventromedial nucleus of the hypothalamus. Collectively, our results indicate that microglial activation

may be dependent on NPY-associated changes in brain and/or body temperature, suggesting that the thermoregulatory effects of NPY may represent a key mechanism underlying the CR-induced suppression of neuroinflammation. Achieving a greater understanding of the mechanisms involved in the CR induced suppression of fever and neuroinflammation may contribute to the development of therapeutic strategies that mimic the anti-inflammatory effects of CR, thus providing potential benefit for the treatment and management of chronic inflammatory conditions, autoimmune disease, and neuroinflammatory diseases.

TIME: 14:10-14:25 **Session Speaker**

Mind-Bugging: How do Bacteria Inside and Beyond the Gut Affect Brain and Behavior?

Jan Pieter Konsman, PhD
Senior scientist at National Center for Scientific Research (France) and University of Bordeaux

There is presently a lot of interest in how bacteria in the gut (gut microbiota) can affect brain and behavior. However, the possibility that bacteria can influence brain and behaviour during infection was put forward more than three decades ago and has been extensively studied by psychoneuroimmunology. Any explanation of the effects of bacteria on brain and behavior needs to take into account biological compartments, such as the gut and the brain, and to come up with signaling mechanisms across biological barriers, including the gut barrier and the blood-brain barrier. In the case of an infection, gut bacteria have obviously been able to pass the gut epithelium forming a biological barrier. Therefore, much of the research on infection-associated behavior has focused on signalling mechanisms across the blood-brain barrier. When it comes to the effects of gut microbiota on brain and behavior, explanations need also account for how signals get across the gut epithelium. At least two types of explanations have been put forward in microbiota-gut-brain (MGB) research. The first can be considered neuroendocrine as it involves the proposed action of mediators produced by gut bacteria, such as acetylcholine, gamma-aminobutyric acid and serotonin, on and in the nervous system. The second invokes the immune system and the production of cytokines, which, in turn, act on and in the nervous system and can therefore be called neuroimmune. The aim of the present work is to compare signalling mechanisms across biological barriers between psychoneuroimmunology and MGB research.

TIME: 14:25-14:40 **Session Speaker**

The Attenuation of Endogenous N-3 Pufas on Olfactory Bulbectomy-Induced Depression-Like Behaviour and Metabolomic Abnormalities in Fat-1 Mice

Cai Song, PhD*, Ling Yan, MSc, Minqing Gu, MSc, Li Tian, PhD, Zhiyou Yang, PhD
Directors, National Leading Scientist

Background: Depression is associated with abnormal lipid metabolism. However, what kind of lipid metabolism is involved in n-3 PUFAs-mediated depressive attenuation remains poorly understood. Because olfactory bulbectomy (OB)-induced changes in behavioral, neuroendocrine and immune response are similar to those observed in depressed patients, the present study used sham operated or OB wild type and Fat-1 mice to explore whether endogenous n-3 PUFAs treat depression was through rectifying lipid metabolism and which lipid metabolic pathways were involved.
Methods: Animal behaviors were studied in “open field” and force swimming test (FST). Ultra-performance liquid chromatography combined with time-of-flight mass spectrometry was used to detect metabolic changes in the serum. Correlation between behaviors and metabolites was evaluated. Finally, one changed metabolite Coproporphyrinogen III (Cop) was studied in a microglia cell line BV2.
Results: In WT mice, OB led to increases in locomotor activity in a novel environment and immobility in FST, which were reversed in Fat-1 mice. A series of metabolites in the serum, including those involved in lipid metabolism, phosphatidylcholines (PC), L-a-glutamyl-L-Lysine and Cop were

up-regulated in WT OB mice, but were attenuated in Fat-1 mice. Five fatty acid metabolic pathways found by KEGG analysis were glycerophospholipid, porphyrin and chlorophyll, linoleic acid, alpha-Linolenic acid and AA metabolism. Levels of PC and Cop were correlated with OB-induced hyperactivity. Furthermore, Cop treatment increased the production of pro-inflammatory cytokines and nitric oxide in BV2.
Conclusion: Endogenous n-3 PUFAs in Fat-1 mice attenuated depression through restoration of lipid metabolism, lipid metabolic pathways and suppression of inflammatory response.

TIME: 14:40-14:55 **Session Speaker**

Early Life Stress and Enhanced Vulnerability to Develop Depression: Focus on the Interplay between the Gut Microbiome and the Immune System

Annamaria Cattaneo, PhD
Head of the Biological Psychiatry Laboratory, IRCCS Fatebenefratelli Institute, Brescia, Italy;
Joint position as Researcher at the Dept. of Psychological Medicine, Institute of Psychiatry, King´s College London.

Background: The exposure to adverse experiences during gestation or the first years of life are known to affect the brain developmental trajectories leading to an enhanced vulnerability for several neurodevelopmental and psychiatric disorders later in life (Lockhart et al. 2018; Syed and Nemeroff 2017). Interestingly, not all the exposed individuals develop stress-related psychiatric disorders, as, contrarily, they acquire coping strategies and become resilient (Pfau and Russo 2015). One of the biological systems that has been found associated with exposure early in life and mediator of enhanced vulnerability for psychiatric disorders is the inflammatory system: preclinical and clinical studies have showed alterations in the peripheral immune and inflammatory systems in association with stress and in association with the future development of depression (Miller and Raison, 2016; Chamberlain et al., 2019). However, it is still not clear where this altered inflammation comes from. Recently researchers have focused their attention on the gut microbiota as one of the key players in shaping the immune/inflammatory system. inflammation.
Methods: We investigated by 16s sequencing the development of the gut microbiome composition in animal model of stress early in life, stress in adolescence, and investigated how the GMB profile, affected by stress exposure, can in turn influence the response to a further stressful challenge in adulthood. The 16s sequencing and the peripheral blood inflammatory profile has been also performed in stool samples of a group of control subjects characterized for childhood trauma events. Finally, the inflammatory profile as possible biomarker of stress vulnerability or resilience has been investigated also in saliva samples of a group of adolescents screened for childhood trauma and for vulnerability or resilience to stress.
Results & Conclusion: We observed that exposure to stress in adolescence induces the development of a specific profile of the GMB, which persists up to adulthood. We also found a correlation between the abundance of specific taxa and the levels of the pro-inflammatory cytokines IL-6 and TNF-alpha measured as released after an acute stressful challenge. Interestingly, some of the taxa that we found altered in animals exposed to stress in adolescence have been observed also in stool samples of control individuals exposed to childhood trauma, where an alterations of inflammatory related pathways have been observed. Finally, to evaluate whether inflammation may serve as biomarker of stress vulnerability and resilience we measured CRP and a panel of pro-inflammatory cytokines in saliva samples of adolescence screened for childhood trauma and for emotional dysregulation. Interestingly, we found that those adolescents exposed to childhood trauma and showing vulnerability traits (emotional dysregulation, conduct problems and self-harming behaviours) also showed enhanced levels of hsCRP.
Our results suggest that the exposure to stress early in life induces alterations in the composition of the gut microbiome which persists up to adulthood and influence the development and activation of the inflammatory/immune system. Moreover, alterations in the inflammatory/immune system are also able to identify those adolescents at higher risk of developing depression as already showing

vulnerable traits.

TIME: 14:55-15:10 **Session Speaker**

Omega-3 Fatty Acids in ADHD

Jane Pei-Chen Chang, MD, PhD

Consultant Psychiatrist, Department of Psychiatry, China Medical University Hospital, Taichung, Taiwan
Visiting Researcher, IoPPN, King's College London, London, UK

Omega-3 polyunsaturated fatty acids (PUFAs) are important nutrients for the developing brain. The current literature showed that n-3 PUFAs deficiency may play a role in the pathogenesis of neurodevelopmental disorder, such as attention deficit hyperactivity disorder (ADHD). However, the study findings on the associations between n-3 PUFAs and ADHD have been controversial. Moreover, omega-3 PUFAs have been reported of anti-inflammatory actions, while ADHD has been linked with inflammation and immune dysregulation. However, no studies have focused on the inflammatory status and treatment responses of omega-3 PUFAs in children with ADHD.
The first part of my presentation will provide an overview of our study findings of omega-3 fatty acids in children with ADHD from cross-sectional, meta-analyses studies. The second part of the presentation will focus on the preliminary findings of our randomized clinical trial of omega-3 PUFAs on the cognitive function in children with ADHD, looking specifically at different inflammatory status.

TIME: 15:10-15:25 **Session Speaker**

Exercise and Lifestyle Factors in Children with Attention Deficit Hyperactivity Disorder: A Mixed-Methods Design

George C.C. Hong, PhD Candidate

CandidateDiscipline of Psychology, School of Health and Biomedical Science, RMIT University, Melbourne, Australia

Background and purpose: Attention deficit hyperactivity disorder (ADHD) is the most frequent neurodevelopmental disorder that affects 5% of children across the world (APA, 2013). Recently more research explores correlations of daily lifestyle patterns, such as quality of diet and sleep with the severity of symptoms. Meanwhile numerous studies have demonstrated benefits for ADHD from brief or a single bout of exercise intervention, little is understood about the daily challenges and needs in engaging children with ADHD in longer-term exercise programs for sustained effects. The present research used a mixed-method design to identify specific needs and critical factors in promoting exercise programs for children with ADHD. An in-depth interview with parents aimed to identify individual challenges and preferences in children's participation in exercise programs. Furthermore, a survey study with a larger number of parents examined mediating mechanisms between exercise, quality of diet, sleep, and screen time in understanding the variance in the severity of ADHD symptoms.
Methods: In the qualitative study, the semi-structured interview was conducted with 21 parents (mean age= 44.05 ± 4.9) caring a 8 to 12 year-old child with ADHD in Australia. Content analysis was performed to abstract themes and categories on children's physical activity with a coding system that was developed from the interview data. In the online survey study, 300 parents of a child with or without ADHD have responded to a lifestyle pattern questionnaire. These data will be analysed with structured equation modeling (SEM).
Results: For the interview study, the coding achieved good inter-rater reliability (kappa = .78) while the number of meaning units in each interview ranged from 65 to 349 (M=198.10±72.72). In the inductive content analysis of the abstraction process, 57 categories under 10 themes emerged from 4159 meaning units. According to the core theme, Exercise was discussed in 818 meaning units. Most parents viewed exercise brings benefits such as physical and psychological accomplishment including building confidence and skill development as well as other emotional effects and social aspects such as making friends and lessening parental stress. Conversely, negative opinions such as little effect or

no help of exercise were also mentioned. Furthermore, interviewees discussed their suggestions for a well-structured, small group, and providing close supervision programs for exercise intervention for children with ADHD. The analysis results from the survey data will indicate possible mechanisms of lifestyle patterns in understanding the ADHD symptom variance.
Conclusion: Attending to parents' voice and responses, the present mixed-method study elaborated the perceived effects and challenges in promoting exercise programs for children with ADHD. The research team will utilise these results to develop a refined 8-week exercise program for children with ADHD based on the current findings. Further implications for research and practice will be discussed to promote exercise as a daily routine in children with ADHD.

S24. FROM MACHINE TO MIND (II)

TIME **16:00-17:30 Mon 8 Oct. 2019**

Location **International Lecture Hall**

The Current Situation, Challenges, and Strategies of Utilizing Digital Health Tools in Mental Health

Chair & Moderator: Yutaka Matsuoka, MD, PhD

Chief, Division of Health Care Research, Center for Public Health Sciences, National Cancer Center Japan
Professor of Lifestyle Medicine, Cooperative Graduate Program, The Jikei University Graduate School of Medicine

Due to the large burden posed by psychiatric disorders, it is important to create accessible screening and intervention tools for individuals at risk for or experiencing psychiatric disorders. As digital devices become increasingly ubiquitous, there is an incredible public health potential for developing digital health tools that can be easily integrated into people's daily lives. Such tools have the potential to increase access to healthcare, decrease treatment costs, and improve long-term outcomes. However, developing and implementing digital health tools that are both effective and usable in everyday life requires a certain approach. There are many aspects and challenges to consider in the design, development, and implementation of these technology-enabled services in order for them to effectively help people gain awareness of their health conditions and manage their problematic symptoms or improve their health. In this session, four speakers will provide their experiences and thoughts on the potential of digital medicine in the field of healthcare. First, Dr. Kishimoto explains an outline of information and communication technology (ICT) and/or machine learning by introducing his projects. Second, Dr. Yoshimoto describes a method called “non-parametric Bayesian co-clustering” and introduces its application to two studies involved in mental health. Third, Dr. Ueno shows the blockchain technology for secure data management in digital medicine including the use of mHealth and IoT. Finally Dr. Matsuoka introduces his ongoing clinical trial of home-based exercise for cancer survivors by using ICT and wearable device with generous supports from the IT and fitness companies.

TIME: 16:00-16:30 **Session Keynote**

Attempt to quantify psychiatric symptoms utilizing information and communication technology and machine learning

Taishiro Kishimoto, MD, PhD

Associate Professor of Psychiatry, Keio University School of Medicine, Tokyo Japan

Needless to say, quantification of symptom severity is important in various medical fields, including psychiatry. However, due to the lack of biomarkers that closely reflect illness severity in psychiatry, the field suffers enormously in diagnosing, assessing treatment response, and developing new drugs. Utilization of information and communication technology and/or machine learning may be one approach to resolve such problems. To date, there have been many attempts to use these technologies in the psychiatric field, and the results are promising to a certain degree. The presenter will review such studies and also introduce a few projects that the presenter is conducting in Japan. The PROMPT (Project for Objective Measures Using Computational Psychiatry Technology), which launched in November 2015, is a study funded by the Japan Agency for Medical Research and Development (AMED). The goal of the study is to quantify the severity of psychiatric symptoms, namely psychomotor retardation for depression, and neurocognitive decline for dementia. Cameras, infrared sensors, and microphones are used to observe patients’ expressions, body motion, and speech during clinical visits. Using a machine learning algorithm based on the data acquired, PROMPT aims to develop a medical device to assess disease symptom severity. Another project, called UNDERPIN (Understanding Psychiatric Illnesses Utilizing Natural Language Processing), is a project

that utilizes natural language processing to extract features expressed in the speech of psychiatric disease patients.
The presentation will cover the concept of these studies, brief progress reports, and the obstacles for the projects.

TIME: 16:30-16:45 **Session Speaker**

Effect of home-based high-intensity interval training and behavioral modification using information and communication technology on cardiorespiratory fitness and exercise habits among sedentary breast cancer survivors: the habit-B study

Yutaka J. Matsuoka, MD, PhD*, Katsunori Tsuji, MA, Yoichi Shimizu, RN, PhD, Eisuke Ochi, PhD
Chief, Division of Health Care Research, Center for Public Health Sciences, National Cancer Center Japan
Professor of Lifestyle Medicine, Cooperative Graduate Program, The Jikei University Graduate School of Medicine

Maintaining high levels of physical activity not only helps to maintain and improve physical health and quality of life, but also plays a role in reducing short- and long-term adverse effects due to cancer treatments. Moreover, a greater degree of cardiorespiratory fitness is associated with reduced risk of all-cause mortality in breast cancer survivors. However, there are no home-based programs for improving cardiorespiratory fitness using body weight exercises for breast cancer survivors. This study assesses the efficacy of the newly developed habit-B program (12-week high-intensity interval training exercise, exercise counselling + guidance, home-based exercise support using information and communication technology, and a wearable device) on peak oxygen uptake (VO2peak; mL/kg/min) compared with treatment as usual. Sixty sedentary breast cancer survivors (Stage I-IIa) are randomized to either 12-week habit-B program or treatment as usual with a wearable device (fitbit versa®). The primary outcome is the difference in change of in VO2peak between the groups after 12 weeks. The planned sample size is 60 patients to detect the increase of 2.0 ml/kg/min change in VO2peak with a one-sided significance level of 2.5% and 80% power. Patient reported outcome such as physical activity, fatigue, fear of cancer recurrence, depression, health-related quality of life, and self-esteem are assessed by a smartphone-based app. Data of resting heart rate, daily steps, daily energy consumption, and sleep stage and duration are obtained from a wearable device. The trial is registered at UMIN-CTR (UMIN000036400). Enrolment, intervention, and data collection are ongoing.

TIME: 16:45-17:00 **Session Speaker**

Data mining based on non-parametric Bayesian co-clustering and its applications to psychiatric and mental health research

Junichiro Yoshimoto, PhD
Associate Professor, Division of Information Science, Graduate School of Science and Technology, Nara Institute of Science and Technology

Co-clustering is a data mining tool that performs a simultaneous grouping of rows (i.e. objects) and columns (i.e. attributes of each object) of the data matrix. While it is very useful in analyzing dyadic data connecting two entities, we sometimes suffer from practical issues such as the determination of a suitable number of groups and coping with missing values. In this talk, we present a method called “non-parametric Bayesian co-clustering,” to solve those issues based on the Bayesian inference. Then, we introduce its application to two studies involved in mental health. One aimed to discover neurophysiological subtypes of depression by analyzing a high-dimensional dataset consisting of resting state functional connectivity measured by functional MRI, clinical questionnaire scores, and so on. Consequently, we identified three subtypes of depression that are characterized by functional connectivity between the right angular gyrus and other brain areas in default mode networks, and CATS (Child Abuse Trauma Scale) scores. These subtypes were also related to Selective Serotonin-Reuptake Inhibitor (SSRI) treatment outcomes. The other aimed to uncover a latent pattern underlying a personal lifelog recorded by a smartphone. The result revealed four categories of recording days, suggesting that experience of mindfulness accompanied with morning physical

exercise after a night of restful sleep will suppress negative feeling. While it was preliminary yet, this approach will help us to make aware of our individual lifestyle and facilitate behavioral change to lead to better health.

TIME: 17:00-17:15 **Session Speaker**

Secure and scalable development of digital medicine using blockchain

Taro Ueno, MD, PhD
CEO, Sustainable Medicine, Inc..

Digital medicine, including the use of mHealth and IoT has become popular in medical practice. It has the potential to promote improved patient health outcomes, support care coordination, and improve communication with lower costs. While digital medicine has the potential for better practices to patients, we need to consider the security of the patient's data. Data tampering and impersonation are important security risks for digital medicine and clinical trials.
Blockchain technology is emerging as an innovative technology for secure data management in many areas, including medical practice. It is based on distributed ledger model that affords a transparent and immutable record on data transactions. We have developed mHealth system combined with blockchchain technology for cognitive behavioral therapy for insomnia using smartphone app and verified the usefulness of blockchain technology in mHealth data management (Ichikawa et al., 2017).
To further extends the usability and security of the blockchain technology in mHealth, we have designed and validated the mHealth system that sends medical data to the blockchain network via relay servers. In order to ensure the reliability of the data from patients' mobile devices, hash values with chain structure (client hashchain) has been adopted. Our proposed mHealth system, blockchain combined with client hashchain, ensures compatibility of security and scalability in the data management of mHealth medical practice (Motohashi et al., 2019).
As the application of the system, we have started a new project in collaboration with National Cancer Center for breast cancer survivors as a regulatory sandbox project of the Japanese government.

VIBRANT MIND & BODY WORKSHOP

TIME **08:30-18:30, Wed 9 Oct. 2019**

Location **Nantou County**

The workshop is a total Mind-Body experience to embrace the natural beauty and cultural richness of Formosa. Featuring a getaway in central Taiwan, colleagues and friends will enjoy the beautiful surroundings, inspiring conversation of science and humanity in medicine, and a must-have lunch with local ingredients to nourish your mind & body. This year, a mindfulness yoga practitioner, Michelle Chiu, will join us to share her insight on health from both Western and Eastern perspectives.

Michelle is certified as the highest certification of ERYT-500 from Yoga Alliance. Her teaching has fostered many in Taiwan as well as overseas. Over the years, she hosts advanced teacher's training program and a variety of workshops to weave Mindfulness teaching into practitioners' yoga practice as well as into life.

Her teaching focus on the overall integration of yoga. Her specialties are to lead the yoga asana practice with emphasis on using the breath to support and also mindfulness awareness during the practice. Other than yoga poses(asana) practice, she also incorporates breath work(pranayama), meditation, yin and restorative yoga into the spectrum of teaching in order to encourage integration and balance to yoga practice in modern busy life nowadays.

In yoga and Zen philosophy, she often shares inspiring stories that can resonate with people to inspire people to bring awareness into their life on all levels of body, mind, emotions, and soul. She leads people to start yoga with the body and slowly deepen into the energy and consciousness body, and then ease into the spirituality of yoga.

In the recent years, she promotes the diversification and integration of yoga practice, which includes Mindfulness yin yoga, Restorative yoga, and Women's yoga. The inspiration comes from the understanding of most yoga practitioner nowadays are women. In the process of life, their body and mind changes dramatically as they enter marriage or parenthood and later into menopause. She encourages practitioners to take on yoga as a tool in a diversification and balance way to support their body, mind and soul during the different phases in life. So that yoga practice is not just the poses we do on the yoga mat; it becomes a way of living and life attitude. The practice will then start from the mat and extend to self-awareness in life, relationships, and self-growth.

Other than yoga, Michelle is also a writer and an activist in surfing and art. She loves mother nature and art creation. She is the author of the book" Mindfulness Yin Yoga". Yoga has supports Michelle's life in many ways and she wishes to share yoga and mindfulness with the world by teaching and writing.

POSTER ALLOCATION

OP011★	Social media addiction: why it's bad for mental health and relationships? **Varoth Chotpitayasunondh**, *Thailand*
PP003	Omega-3 fatty acids ameliorate cognitive dysfunction in schizophrenia patients with metabolic syndrome **Wei Tang**, *China*
PP008	Chinese Students' Psychological Distress and Somatic Symptoms at British University: A Comparison with Chinese Students at Home **Lei Qian**, *China*
PP012	A Prediction Model for Evaluating Postpartum Depression Symptoms **Jie Zhu**, *China*
PP013	Effects of Depressive Symptoms on Pregnant Women's Attention to Infant-related Emotional Images：An Eye Tracking Study **Wenqian Feng**, *China*
PP014	The relationship between skipping breakfast and depression among workers with a focus on psychosocial factors **Eisho Yoshikawa**, *Japan*
PP015	Pharmacological strategy in regulating Glymphatic function **Senthil Kumaran Satyanarayanan**, *Macau*
PP016	Prevalence and risk factors of sarcopenia among elder people in a veteran retirement community in southern Taiwan **Aih-Fung Chiu**, *Taiwan*
PP017	Association of red blood cell n-3 polyunsaturated fatty acid levels and single nucleotide polymorphisms in fatty acid desaturase and elongase with the psychological state of Japanese elders **Tamami Ueda**, *Japan*
PP018	The optimal light color and measuring mode for photoplethysmography in the presence of motion artifacts **Kenta Matsumura**, *Japan*
PP019	Effect of isoginkgetin on LPS-induced depressive-like behaviors in mice and the underlying mechanism **Peng Li**, *China*
PP021	The depressive-like behaviors of unpredictable chronic mild stress-treated rat ameliorated by Poria cocos water extract involvement in inflammation **Yun-Ju Huang**, *Taiwan*
PP023	Compare depression, sleeping, and quality of life in rheumatoid arthritis, systemic lupus erythematous, ankylosing spondylitis and psoriasis/psoriatic arthritis **Ying-Ming Chiu**, *Taiwan*
PP026	Midlife cancer/diabetes and risk of dementia and mild cognitive impairment: a population-based prospective cohort study in Japan **Ryoichi Sadahiro**, *Japan*
PP027	Depression-free after Interferon-α (IFN-α) Exposure Indicates Less Incidence of Depressive disorder: A Population-Based Retrospective Cohort Study in Taiwan **Ching-Fang Sun**, *Taiwan*

PP028★	Efficacy and Acceptability of Varenicline for Alcoholism: A Systematic Review and Meta-Analysis of Randomized-Controlled **Awirut Oon-arom Oon-arom**, *Thailand*
PP029	C-Reactive Protein is Associated With the Severity of Thought and Language Dysfunction in Patients With Schizophrenia **Chang Chun-Hung**, *Taiwan*
PP030	Peripheral Brain-Derived Neurotrophic Factor and Contactin-1 Levels in Patients with Attention-Deficit/Hyperactivity Disorder **Liang-Jen Wang**, *Taiwan*
PP033	Explore the anti-depression effect on water extract of Gastrodia elatae Blume via gut-brain axis in subchronic and mild social defeat stress mouse model **Huai-Syuan Huang**, *Taiwan*
PP040	The learning effects during high beta down-training neurofeedback for patients comorbid with major depressive disorder and anxiety symptoms. **Chen Ting-Chun**, *Taiwan*
PP041	Reliability and Validity of the Chinese Version of Emotional Eater Questionnaire and Grazing Questionnaire **Chia-I Ko**, *Taiwan*
PP042	Change of employment status in patients with depression **An Pham**, *Vietnam*
PP043	Attempt of long-term stress quantification by pulse wave measurement using non-contact devices **Shun Kudo**, *Japan*
PP052	Modeling of shotgun sequencing of DNA plasmids using experimental and theoretical approaches **Sergey Shityakov**, *Taiwan*

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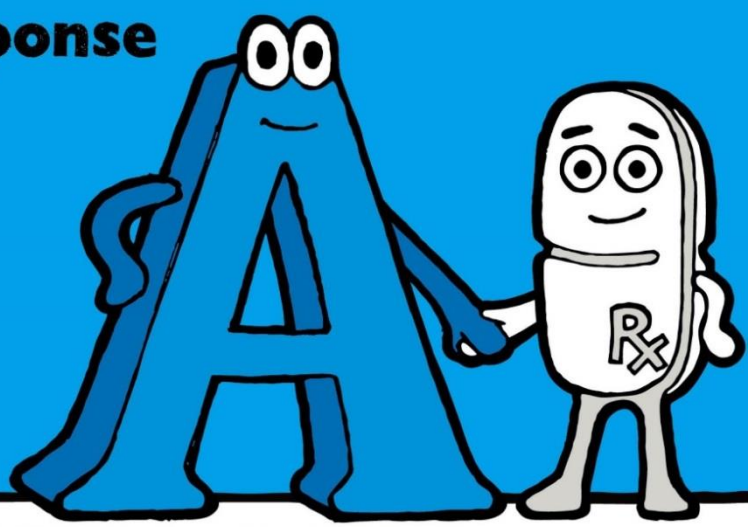

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		思覺失調症	10 or 15 mg/day	10 or 15 mg/day	30 mg/day
		雙極性疾患之躁症發作及混合型發作，單獨使用	15 mg/day	15 mg/day	30 mg/day
		雙極性疾患之躁症發作及混合型發作，鋰鹽或Valproate輔助治療 第一型雙極性疾患維持治療，鋰鹽或Valproate輔助治療	10-15 mg/day	15 mg/day	30 mg/day
青少年（13-17歲）		思覺失調症	2 mg/day	10 mg/day	30 mg/day
兒　童（10-17歲）		雙極性疾患之躁症發作及混合型發作，單獨使用及鋰鹽或Valproate輔助治療 第一型雙極性疾患維持治療，鋰鹽或Valproate輔助治療	2 mg/day	10 mg/day	30 mg/day
兒　童（6-17歲）		自閉性疾患伴隨之急躁易怒	2 mg/day	5-15 mg/day	15 mg/day
兒　童（6-18歲）	< 50 公斤	妥瑞氏症	2 mg/day	5 mg/day	10 mg/day
	≥50 公斤		2 mg/day	10 mg/day	20 mg/day

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雙極性情感異常，混合型	296.6	F31.6
重鬱症，單純發作	296.2	F32
重鬱症，復發	296.3	F33
自閉症	299	F84
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  - 不常見：潮紅、夜間盜汗。
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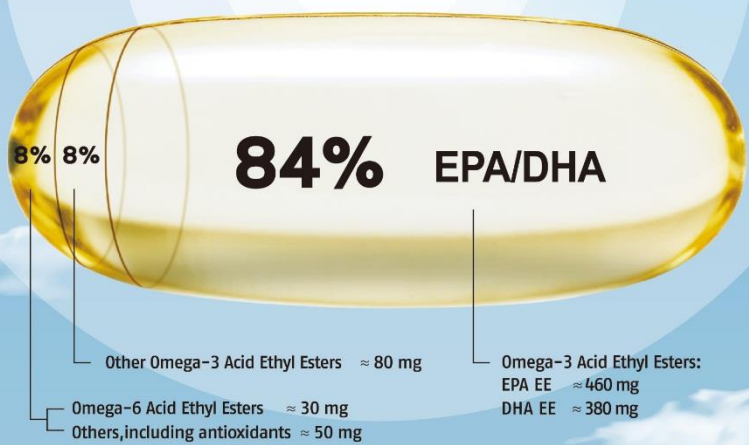

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In

糖尿病周邊神經病變所引起的神經性疼痛

脊髓損傷所引起的神經性疼痛

成人局部癲癇的輔助治療

帶狀疱疹後神經痛

Fibromyalgia 纖維肌痛

衛署藥輸字第 024995 號
北衛藥廣字第 10807006 號

處方資訊摘要

■ **適應症**

成人局部癲癇的輔助治療、帶狀疱疹後神經痛、糖尿病周邊神經病變引起的神經性疼痛、纖維肌痛、脊髓損傷所引起的神經性疼痛。

■ **用法用量**

口服，停止服用LYRICA時，應以至少一週的時間逐漸減量。用於腎功能減退的患者應調整劑量。

帶狀疱疹後神經痛

LYRICA的建議劑量是75-150 mg 每天二次或50-100 mg 每天三次 (150-300 mg/天)。應從75 mg 每天二次或50 mg 每天三次 (150 mg/天) 開始給藥，根據療效和耐受性可在一週之內將劑量增加到 300 mg/天。

脊髓損傷所造成的神經性疼痛

從75mg每天二次(150 mg/天)開始給藥，根據療效和耐受性可於一週內將劑量增加到 150mg每天二次(300 mg/天)，最高可用300mg每天二次(600 mg/天)。

成人局部癲癇的輔助治療

LYRICA在150-600 mg/天的劑量下是成人局部癲癇發作的有效輔助治療。每日總劑量應該分二次至三次給藥。一般建議從不高於 150 mg/天 (75 mg 每天二次或50 mg 每天三次) 的每日總劑量開始。

糖尿病周邊神經病變引起的神經性疼痛

開始時應先投予75mg每天二次或50mg每天三次，根據療效和耐受性，最高可於一週內增加到 300 mg/天，可分一天150mg兩次或一天100mg三次(300/天)服用。

纖維肌痛

以75mg一天兩次(150mg/天)的服用方式開始時應先投予劑量，視療效與耐受性而定，可於 1 週內將劑量提高至150mg每天二次(300 mg/天)，若仍未能獲足夠的治療效益最高可增加到 225mg每天二次(450 mg/天)。

■ **懷孕**

LYRICA未在孕婦中進行適當且有良好對照的研究，只有在對孕婦潛在效益大於對胎兒的潛在風險時方可在懷孕期間使用。在適應症提及的族群中，重大先天性缺陷和流產的背景發生風險不明。請告知孕婦可能對胎兒造成的風險。

■ **授乳**

曾在授乳中女性的乳汁中偵測到少量pregabalin。由於有導致腫瘤生成的潛在風險，因此不建議於LYRICA治療期間哺餵母乳。

■ **禁忌**

LYRICA禁用於已知對pregabalin或本品其他任何成分過敏的患者。曾有使用pregabalin 的患者發生血管性水腫與過敏的現象。

■ **不良反應**

在結合所有患者群的上市前對照性試驗中，接受 LYRICA 治療者比接受安慰劑治療者較常通報頭暈、嗜睡、口乾、水腫、視力模糊、體重增加及「思考異常」(主要是專注力/注意力困難) 等不良反應(≧ 5% 而且是在安慰劑組出現比率的 2 倍)。

■ **注意事項**

應告知患者 LYRICA 所引起的頭暈與嗜睡可能會使其從事諸如駕駛或操作機器等工作的能力受損。

★ 完整 LYRICA 資訊請參閱仿單

Reference : 1. LYRICA仿單(版本USPI 201805-1)

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