

Program Book



MBI Symposium
Mind-Body Interface Symposium

11th Mind-Body Interface International Symposium
PNIRSAAsia-Pacific Symposium

**20
21**

Oct. 30–31
Taichung, Taiwan

Tune into the Mind & Body

Finding the melody to promote mental health wellbeing



Take the road
to full recovery

Valdoxan®

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Agomelatine 25 mg

The only melatonergic antidepressant



有效緩解鬱症的2個核心症狀

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【成份】每錠含 Agomelatine 25 mg

【適應症】成人鬱症。

【用法・用量】

一般建議每天一顆 Valdoxan® 25mg 於睡前口服使用。治療兩週後，若症狀沒有改善時，劑量可增加至每天50mg，也就是 Valdoxan® 25mg 兩顆，於睡前一次服用。於憂鬱症老年患者(<75歲)，agomelatine(每天25至50mg)的療效與安全性已經確立。

【禁忌】

- 對有效成分或任一賦形劑過敏者
- 肝功能不全者，特別是針對肝硬化或活動性肝臟疾病，或肝轉胺酶指數 ≥ 3 倍正常值上限者
- 併用CYP1A2強抑制劑者(如fluvoxamine、ciprofloxacin)

【不良反應】

最常見的不良反應是噁心和暈眩，不良反應通常是輕度或中度，並且在開始治療前兩周內發生。這些不良反應通常是短暫的，而且一般不會導致停止治療。

【包裝】每盒28錠



詳細資料備索 僅限專業人員使用·處方前請詳閱仿單警語及注意事項



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MBI Symposium
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Chairman's Message

Dear Colleagues and Friends,

Despite the challenge of COVID-19 pandemic, the 11th Mind-Body Interface (MBI) International Symposium is to be held as a form of hybrid conference, with pre-recorded talks, online discussion in our physical conference site in Taichung, Taiwan on October 30-31, 2021.

Organized annually by Mind-Body Interface Research Center (MBI-lab) and Taiwanese Society for Nutritional Psychiatry Research (TSNPR), we are delighted to co-chair this 2-day international conference with the PNIRASia-Pacific Symposium for four consecutive years in a row.

The main theme this year is "Tune into the Mind & Body: Finding the Melody to Promote Mental Health Wellbeing". A growing body of evidences has shown that arts as a tool for enhancing mental health wellbeing are well-documented, such as to manage stress, express feelings, enhance memory, improve communication and to promote physical wellness. Findings of the present meta-analysis also indicated that music therapy provides short-term beneficial effects for people with depression, which also shows efficacy in decreasing anxiety levels and improving functioning of depressed individuals. Researches with methodological rigors, novelty of study design and outcome measures as well as, elucidating biological mechanisms underlying these interventions could encourage the advancement of creative art therapy in mental illness, and to promote non-medical intervention for public health and mental wellbeing in a wide variety of healthcare and educational settings.

The MBI International Symposium has been vigorously promoting a global agenda of translational neuroscience by encouraging interdisciplinary research, and integrating biomedical discovery and development focused on patients, to provide better care and service in the field of mental health. The symposium is featured with a broad range of topics, including immunology, metabolic processes and molecular science, psychopharmacology, psychology, the brain-gut-microbe axis as well as biological processes and factors underlying the links between diet, nutrition and mental health from the perspective of Western medicine and traditional Chinese medicine. Furthermore, there will be a strong focus on the use of brave approach and novel technology, artificial intelligence, big data, neuroimaging, personalized medicine, lifestyle intervention, health promotion and disease management, and epidemiology and population studies in brain disorders. Our programme includes keynote speeches, state of the art symposia, oral and poster presentations, as well as Mind-Body Workshop. Early-career researchers are encouraged to join us and bursaries are provided to apply.

MBI Symposium is insightful and inspiring with active discussion among participants. With the great Taiwanese hospitality and richness of cultural and natural heritage of Formosa, the 11th MBI Symposium is guaranteed to be another wonderful event like it has been in the previous years. We look forward to greeting our biomedical researchers, psychiatrists and other health professionals worldwide in Taichung.



Kuan-Pin Su

Prof. Kuan-Pin Su, M.D., Ph.D.

Chairman, 11th MBI International Symposium

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital, Taiwan

President, Taiwanese Society for Nutritional Psychiatry, Taiwan

Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

Committees

Organizing Committee

- **Prof. Kuan-Pin Su, M.D., Ph.D. (Symposium Chairman)**
Professor & Director, Mind-Body Interface Laboratory, CMU Hospital, Taiwan
President, Taiwanese Society for Nutritional Psychiatry, Taiwan
Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan
- **Dr. Jane Pei-Chen Chang, M.D., Ph.D. (Scientific Committee Chairman)**
Director, Child Psychiatry Division, Department of Psychiatry, CMU Hospital, Taiwan
Director, Taiwanese Society for Nutritional Psychiatry Research, Taiwan
- **Dr. Cherry Hui-Chih Chang, Ph.D.**
Secretary-General, Taiwanese Society for Nutritional Psychiatry Research, Taiwan
Researcher, Mind-Body Interface Center, CMU Hospital, Taiwan

Scientific Committee

- **Dr. Jane Pei-Chen Chang, M.D., Ph.D. (Scientific Committee Chairman)**
- **Prof. Kuan-Pin Su, M.D., Ph.D. (Symposium Chairman)**
- **Prof. Keith W. Kelley, Ph.D.**
Professor, Immunophysiology, University of Illinois, USA
Editor-in-Chief Emeritus, Journal of Brain, Behavior, and Immunity
- **Prof. David Mischoulon, M.D., Ph.D.**
Professor, Psychiatry, Harvard Medical School, USA
Depression Clinical and Research Program, Massachusetts General Hospital, USA
- **Prof. Richard Bazinet, Ph.D.**
Professor, Department of Nutritional Sciences, University of Toronto, Canada
Canada Research Chair, Brain Lipid Metabolism, Canada
Immediate Past President, International Society for the Study of Fatty Acids and Lipids (ISSFAL)
- **Dr. Wolf Marx, Ph.D.**
Alfred Deakin Postdoctoral Research Fellow, Department of Medicine, Deakin University, Australia
Postdoctoral Research Fellow and Head of the Nutraceutical Research Stream, Food & Mood Centre, Australia
- **Dr. Cheng-Hao Tu**
Associate Professor, Acupuncture Science of Graduate Institute, CMU Hospital, Taiwan
Supervisor, Taiwanese Society for Nutritional Psychiatry Research (TSNPR)
- **Prof. Tsuo-Hung Lan**
Superintendent, Tsaotun Psychiatric Center, Taiwan
Professor, School of Medicine, National Yang Ming University, Taiwan
- **Dr. Chih-Chung Wu Ph.D.**
Chairman, Department of Nutrition and Health Science, Chang-Jung Christian University, Taiwan
Director, Taiwanese Society for Nutritional Psychiatry Research (TSNPR)
- **Prof. Nai-Wen Chang**
Associate Professor, Department of Music, Tunghai University, Taiwan
- **Prof. Wei-Che Chiu, M.D., Ph.D.**
Associate Professor, School of Medicine, Fu Jen Catholic University, Taiwan
Director, Department of Psychiatry, Cathay General Hospital, Taiwan
Director, Taiwanese Society for Nutritional Psychiatry Research (TSNPR)



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Acknowledgement

Organizer / 主辦單位



China Medical University
中國醫藥大學



China Medical University Hospital
中國醫藥大學附設醫院



Tainan Municipal An-Nan Hospital -
China Medical University
台南市立安南醫院



Taiwanese Society for
Nutritional Psychiatry Research
台灣營養精神醫學研究學會

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Psychoneuroimmunology Research Society (PNIRS)



Taiwan Neuroscience Society
台灣基礎神經科學學會

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Continuous Education Credits 繼續教育積分

Taiwan Dietitian Association 中華民國營養師公會全國聯合會 (11.2學分)

Taiwan Medical Association 中華民國醫師公會全國聯合會 (11學分)

Taiwanese Society of Child and Adolescent Psychiatry 台灣兒童青少年精神醫學會 (1學分)

Taiwanese Society of Geriatric Psychiatry 社團法人台灣老年精神醫學會 (審查中)

Taiwanese Society of Psychiatry 台灣精神醫學會 (3.5學分)

Taiwan Society of Sleep Medicine 台灣睡眠醫學會 (5學分)



Program at a Glance

Date/Time	Oct. 30	Date/Time	Oct. 31
08:30-09:00	Registration	08:30-09:00	Registration
09:00-09:20	Opening Ceremony		S21. Novel Treatment for Depression Chair: David Mischoulon (US) Maren Nyer (US) Sam Petrie (US) Felipe Jain (US) Cristina Cusin (US) Q&A
09:20-11:20	S11. PNIRASia-Pacific I Chair: Keith W. Kelley (USA) David Creswell (USA) Melissa Rosenkranz (USA) Richard Simpson (USA) Liye Zou (China) Tatia Mei-Chun Lee (Hong Kong) Q&A	09:00-11:00	
		11:00-11:10	Break
11:20-11:30	Break	11:10-11:40	S22. Meet the Expert Richard Bazinet (CA)
11:30-12:10	PK1. Plenary Keynote Julienne E. Bower (US)		
12:10-13:30	Lunch and Virtual Poster Session	11:40-13:30	Lunch and Virtual Poster Session
13:30-15:10	S12. PNIRASia-Pacific II Chair: Sarah J. Spencer (AU) Adam K. Walker (AU) Jane Pei-Chen Chang (TW) Luba Sominsky (AU) Simone N. De Luca (AU) Q&A	13:30-14:10	S23. Selected Oral Presentation Po-Han Chou (TW) Ya-Chun Feng (TW)
		14:10-14:50	PK3. Plenary Keynote Alexander T. Sack (NL)
		14:50-15:30	Break
15:10-15:40	Break		
15:40-16:20	PK2. Plenary Keynote Kuan-Pin Su (TW)		S24. Nutritional Psychiatry Chair: Wolf Marx (AU) Annamaria Cattaneo (IT) Melissa Lane (AU) Elizabeth Gamage (AU) Nikolaj Travika (AU) Q&A
16:20-17:00	S13. 5-min Poster Blitz	15:30-16:30	PK4. Plenary Keynote John F. Cryan (IE)
17:00-18:30	Interaction with Speakers of Educational Workshop 1, 2 & 3 (in Mandarin) WS3. Workshop 3 WS2. Workshop 2 WS1. Workshop 1	16:30-17:10	
		17:10-17:30	Closing Remark
18:30-20:30	Dinner and Award Ceremony		

1. PK: Plenary Keynote speech; S: Session; WS: Workshop

2. For each session, discussion can be scheduled according to the session chair's discretion (e.g., after individual talks, concentrated at the end of a session).

Daily Program

Saturday, October 30

08:30-09:00	Registration
09:00-09:20	Opening Ceremony
09:20-11:20	S11. PNIRASia-Pacific Session I Non-Pharmaceutical Interventions to Improve Mental Health
09:20-09:25	<u>Chair:</u> Keith W. Kelley, USA
09:25-09:45	How do Mindfulness Interventions Work? David Creswell, USA
09:45-10:05	The Benefits of Mindfulness-Based Stress Reduction for Chronic Inflammation Melissa Rosenkranz, USA
10:05-10:25	Acute Exercise Increases Immune Responses to SARS CoV-2 in Naturally Infected and Vaccinated Humans Richard Simpson, USA
10:25-10:45	Regular Tai Chi Practice is Associated with Improved Memory as Well as Structural and Functional Alterations of the Hippocampus in the Elderly Liye Zou, China
10:45-11:05	Qigong Exercise Enhances Cognitive Functions in Older People Tatia Mei-Chun Lee, Hong Kong
11:05-11:20	Discussion
11:20-11:30	Break
11:30-12:10	PK1. Plenary Keynote 1 Mind-Body Interventions in Cancer Survivors: Targeting Neuro-Immune Pathways to Promote Well-Being Julienne E. Bower, USA
12:10-13:30	Lunch and Virtual Poster Session
13:30-15:10	S12. PNIRASia-Pacific Session II The Immune System is a Conduit that Links Environmental Stimuli to Brain Function
13:30-13:35	<u>Chair:</u> Sarah J. Spencer, Australia
13:35-13:55	The Role of Neuroinflammation in Cancer-Related Cognitive Impairment Adam K. Walker, Australia
13:55-14:15	Nutritional Psychiatry as the Mainstream: Focus on Omega-3 Fatty Acids in ADHD Jane Pei-Chen Chang, Taiwan
14:15-14:35	Modulatory Effects of Peri-Pregnancy Diet on the Maternal Brain Luba Sominsky, Australia

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14:35-14:55	Cigarette Smoke Induced-Cognitive Dysfunction is Associated with Increased Oxidative Stress in the Brain Simone N. De Luca, Australia
14:55-15:10	Discussion
15:10-15:40	Break
15:40-16:20	PK2. Plenary Keynote 2 The Interplay of Stress, Nutrition, and Inflammation in the Mind-Body Symphony Kuan-Pin Su, Taiwan
16:20-17:00	S13. 5-min Poster Blitz
16:20-16:25	Association between Kawasaki Disease in Childhood and Psychiatric Disorders: A Population-Based Cohort Study Tzu-Li Chen, Taiwan
16:25-16:30	The Healing Power of Dancing Together - A Narrative Study of Dance Movement Therapy Group for People with Dementia Yin-Hui Hong, Taiwan
16:30-16:40	The Anti-Obesity and Anti-Depressant Effects Evaluation of Korean Red Ginseng Extract in High-Fat Diet with an Unpredictable Chronic Mild Stress-Induced Obesity and Depression Mice Model Hsin-Chen Tsai, Taiwan
16:40-16:45	Omega-3 Fatty Acids on White Matter Hyperintensity and Cognitive Impairment in Patients with Vascular Depression Shih-Chun Meng, Taiwan
16:45-16:50	A Systematic Review of Adverse Childhood Experiences and Resilience on High-Risk Behavior, Emotional and Somatic Symptoms Chia-Yu Chen, Taiwan
17:00-18:30	Interaction with Speakers of Educational Workshop 1, 2 & 3 (in Mandarin)
17:00-17:30	WS3. Workshop 3 營養精神醫學核心課程
17:30-18:00	WS2. Workshop 2 TMS 臨床實務工作坊
18:00-18:30	WS1. Workshop 1 憂鬱症研究核心課程
18:30-20:30	Dinner and Award Ceremony

1. PK: Plenary Keynote speech; S: Session; WS: Workshop

2. For each session, discussion can be scheduled according to the session chair's discretion (e.g., after individual talks, concentrated at the end of a session).

Sunday, October 31

08:30-09:00	Registration
09:00-11:00	S21. Novel Treatment for Depression Session Cutting Edge Therapies for Depressive Disorders: Clinical Efficacy and Mechanisms of Action
09:00-09:25	<u>Chair</u> : David Mischoulon, USA
09:25-09:45	Primary Clinical Outcomes from a Randomized Controlled Trial of Heated Yoga for Depression Maren Nyer, USA
09:45-10:05	Biological Findings from a Randomized Controlled Trial of Heated Yoga for Depression Samuel Petrie, USA
10:05-10:25	Randomized Controlled Trial of Mentalizing Imagery Therapy for Family Dementia Caregivers: Clinical Effects and Brain Connectivity Changes Felipe Jain, USA
10:25-10:45	Ketamine and Esketamine -from Research to Clinical Practice Cristina Cusin, USA
10:45-11:00	Discussion
11:00-11:10	Break
11:10-11:40	S22. Meet the Expert Murine and Human Microglial Cells are Relatively Enriched with Eicosapentaenoic Acid Compared to the Whole Brain Richard Bazinet, Canada
11:40-13:30	Lunch and Virtual Poster Session
13:30-14:10	S23. Selected Oral Presentation
13:30-13:50	Prefrontal Cortical Activity Predicts Therapeutic Effects of Repetitive Transcranial Magnetic Stimulation in Major Depression: A Near-Infrared Spectroscopy Po-Han Chou, Taiwan
13:50-14:10	Cognitive Biases Predict Worry and Anxiety During Examinations and COVID-19 Pandemic -A UK Sample Ya-Chun Feng, Taiwan
14:10-14:50	PK3. Plenary Keynote 3 Transcranial Magnetic Stimulation: Towards Personalized Neuromodulation in Mental Health Alexander T. Sack, Netherlands
14:50-15:30	Break

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15:30-16:30	S24. Nutritional Psychiatry Session
15:30-15:35	Chair: Wolf Marx, Australia
15:35-15:55	Stress Early in Life and Long-Term Alterations in the Inflammatory System and in the Gut Microbiome Composition: Implications for Psychiatric Disorders Annamaria Cattaneo, Italy
15:55-16:05	Assessing the Interplay between Ultra-Processed Foods Consumption and Indicators of Inflammation and Depression Melissa Lane, Australia
16:05-16:15	Polyphenols as Novel Dietary Interventions for Depression: Exploring the Efficacy, Safety and Implicated Mechanisms of Action Elizabeth Gamage, Australia
16:15-16:25	The Effects of Surgery on Plasma Vitamin C Concentrations and Cognitive Function Nikolaj Travika, Australia
16:25-16:30	Discussion
16:30-17:10	PK4. Plenary Keynote 4 A Gut Feeling About the Brain: Microbiome & Mental Health John F. Cryan, Ireland
17:10-17:30	Closing Remark

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Program Details

October 30, 2021

Opening Ceremony

Time: 09:00-09:20

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Opening Remark by Symposium Chairman

Prof. Kuan-Pin Su, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital, Taiwan

President, Taiwanese Society for Nutritional Psychiatry, Taiwan

Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

Opening Remark by Honorary Guests

Prof. Mien-Chie Hung

President of China Medical University, Taiwan

Academician of the Academia Sinica, Taiwan

Prof. Chon-Haw Tsai

Dean, College of Medicine, China Medical University, Taiwan



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S11. PNIRASia-Pacific Session I

Time: 09:20-11:20

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Chair: Keith W. Kelley, Ph.D.

Professor, Immunophysiology, University of Illinois, USA

Editor-in-Chief Emeritus, Journal of Brain, Behavior, and Immunity

Non-Pharmaceutical Interventions to Improve Mental Health

Session Summary:

Prescription drugs are widely used across the globe. For example, nearly half of Americans, and 80% of those over 60 years of age, use some type of pharmaceutical drug to treat disorders in mental health, heart disease/hyperlipidemia, and analgesia. Of these, anti-depressants and anti-anxiety medications are the most highly prescribed for psychological well-being. While most medicines provide some measure of relief, they are expensive and can cause significant side effects. This PNIRASia-Pacific symposium offers two non-pharmaceutical possibilities to improve mental health disorders. They are mindfulness and exercise, with the practice of mindfulness now blending with traditional Chinese meditation and exercise. Professor J. David Creswell at Carnegie-Mellon in Pittsburgh will share data that shows how paying attention to one's surroundings, living in the moment and acceptance of one's self are key components of improving mental health. Mindfulness training is especially helpful for subjects who are lonely, depressed, or experiencing chronic pain. Professor Creswell will discuss the procedures used in mindfulness-based stress intervention training that will include smartphone training. Data indicate that mindfulness training couples the resting brain with the dorsolateral prefrontal cortex, and this relates to a reduction in serum IL-6. Professor Melissa Rosenkranz at the University of Wisconsin-Madison will extend these findings on mindfulness meditation to inflammation. She will describe a model that combines the Trier Social Stress Test and neurogenic inflammation to evaluate the potential benefit of mindfulness meditation. To induce neurogenic inflammation, capsaicin is applied to the skin, which leads to the local release of inflammatory neuropeptides by afferent neurons. Following 8 weeks of training, mindfulness reduced the inflammatory response compared to controls subjects who trained in a health enhancement program. A separate investigation conducted by Professor Rosenkranz used experienced meditators, and that study confirmed the reduction in neurogenic inflammatory responses, and well as a reduction in the Trier Social Stress Test-induced release of cortisol compared to the control group. Richard Simpson at the University of Arizona will share data on the impact of being physically active during the COVID19 pandemic. He will describe his earlier work with astronauts with high levels of skeletal muscle endurance who are better able to prevent latent herpes virus reactivation. These data will highlight how moderate exercise augments many functions of the immune system, with a focus on the frequent mobilization and redistribution of both lymphoid and myeloid cells. Tai Chi and Qigong are popular arts that combine physical exercise with meditation. Professor Liye Zou at Shenzhen University will discuss data collected from elderly women who had more than 6 years of experience with either Tai Chi or brisk walking. Tai Chi not only improved episodic memory but also increased higher gray matter density in the inferior and medial temporal regions, including the hippocampus. Qigong exercise, which incorporates meditation with

both movement and breathing, acts similar to Tai Chi in improving cognitive function. Professor Tatia Lee at the University of Hong Kong will describe the results of 12 weeks of Qigong training compared to standard exercise training in elderly men and women. Her results showed that Qigong also increased hippocampal volume and reduced blood levels of IL-6 as well, which is one biomarker of systemic inflammation. Collectively, these results provide evidence that mindfulness meditation, either alone or when combined with the traditional Chinese exercises of Tai Chi and Qigong, enhances cognitive performance and reduces IL-6.

Time: 09:25-09:45

How do Mindfulness Interventions Work?

David Creswell, Ph.D.

Associate Professor, Psychology, Carnegie Mellon University, USA

Principal Investigator, The Health and Human Performance Lab

Mindfulness meditation interventions have been shown to have mental and physical health benefits in initial randomized controlled trials (RCTs), and research attention has now turned to understanding the biobehavioral mechanisms for intervention effects. We have developed a new theoretical account called Monitor and Acceptance Theory (MAT) which describes how acceptance and equanimity skills may be a key mechanism for stress reduction and health benefits observed after mindfulness interventions. This talk will describe MAT and several dismantling RCTs of mindfulness interventions, showing that acceptance and equanimity skills may be a key mechanism for their benefits, such as biological stress reduction, emotional well-being, and social relationships. Discussion will explore next steps for MAT theory and research.

Time: 09:45-10:05

The Benefits of Mindfulness-Based Stress Reduction for Chronic Inflammation

Melissa A. Rosenkranz, Ph.D.

Assistant Professor, Psychiatry and Distinguished, University of Wisconsin School, USA

Background: Chronic inflammatory diseases are notoriously vulnerable to stress- and emotion-induced flare-ups. Mindfulness-based stress reduction has shown promise in reducing inflammation and buffering the pro-inflammatory effects of psychological stress. However, its efficacy in ameliorating the negative impacts of stress in chronic inflammatory conditions is less well-studied. Here, I will present data from 3 separate studies supporting the benefits of mindfulness training in populations with chronic inflammatory disease.

Methods: In study 1, healthy participants were randomized to an 8-week training in mindfulness-based stress reduction (MBSR) or an active control intervention. All participants underwent the Trier Social Stress Test (TSST) before randomization and again post-intervention. Neurogenic inflammation, an important component of the underlying pathophysiology in most chronic inflammatory diseases, was induced in forearm skin via application of capsaicin cream, before performance of the TSST. The resulting inflammatory response was measured after completion of the TSST at each timepoint. The design of study 2 was identical to that of study 1, except that long-term meditators (LTM) were compared to meditation-naïve participants (MNP). In study 3, participants with asthma, a chronic inflammatory disease of the airways, were randomized to 8 weeks of MBSR training or to a wait-list control group. Asthma control was measured using the Asthma Control Questionnaire, at



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baseline, at the mid-point of the intervention, and at monthly follow-up visits from intervention completion to 4-months post-intervention.

Results: In studies 1 and 2, the MBSR and LTM groups developed smaller post-stress inflammatory responses at post-training, relative to the active control group ($p < .01$) and MNPs ($p < .05$), respectively. Moreover, the LTM also has a significantly smaller cortisol response to the TSST compared to the MNP group ($p < .05$). In study 3, asthma participants randomized to receive MBSR training had a significant and clinically meaningful improvement in asthma control across the duration of the study ($p = .01$). Importantly, this effect was most pronounced in those with the greatest depressive symptoms at baseline ($p < .05$).

Conclusions: In studies 1 and 2, training in mindfulness, an intervention that targets the mind and its relationship to stress, was associated with a significant reduction in the impact of psychological stress on neurogenic inflammation in healthy adults. Neurogenic inflammation is believed to be an important mechanism through which stress confers risk for exacerbation in chronic inflammatory conditions. We extended these results in study 3, to demonstrate the benefits of mindfulness training to improving disease control in asthma patients – the primary goal of asthma treatment. Collectively, the results from these 3 studies suggest that MBSR may be a valuable addition to comprehensive treatment plans for individuals with chronic inflammation.

Time: 10:05-10:25

Acute Exercise Increases Immune Responses to SARS CoV-2 in Naturally Infected and Vaccinated Humans

Richard J. Simpson^{1,2,4,5}, Forrest L. Baker^{1,2}, Kyle A. Smith¹, Tiffany M. Zúñiga, Helena Batatinha¹, Shane C. Burgess^{3,5}, Emmanuel Katsanis^{2,4,5, 6,7}

¹ Department of Nutritional Sciences, University of Arizona, Tucson, AZ, USA

² Department of Pediatrics, University of Arizona, Tucson, AZ, USA

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⁵ Department of Immunobiology, University of Arizona, Tucson, AZ, USA

⁶ Department of Medicine, University of Arizona, Tucson, AZ, USA

⁷ Department of Pathology, University of Arizona, Tucson, AZ, USA

Background: Evidence is emerging that exercise and physical activity provides protection against severe COVID-19 disease in patients infected with SARS-CoV-2, but it is not known how exercise affects immune responses to the virus.

Methods: Healthy individuals previously infected with SARS CoV-2 and/or recently (within 2-3 weeks) received a COVID-19 vaccine completed a graded cycling ergometer test. Blood samples were collected at rest, during exercise at 60% and 80% VO₂max, and at 1h post exercise. Viral specific T-cell responses were characterized using whole blood SARS-CoV-2 peptide stimulation assays, IFN- γ ELISPOT assays, flow cytometry, ex vivo viral-specific T-cell expansion assays and deep T-cell receptor (TCR) β sequencing. Results: Exercise robustly mobilized highly functional SARS-CoV-2 specific T-cells to the blood compartment in naturally infected participants that recognized spike protein, membrane protein and nucleocapsid antigen. The mobilized SARS-CoV-2 specific T-cells consisted mostly of CD3⁺/CD8⁺ T-cells and double-negative (CD4⁻/CD8⁻) CD3⁺ T-cells. The magnitude of SARS-CoV-2 T-cell mobilization with exercise was intensity dependent and robust when

compared to T-cells recognizing other viruses (e.g. CMV, EBV, influenza). Vaccination enhanced the number of exercise-mobilized SARS-CoV-2 T-cells recognizing spike protein only. Exercise-mobilized SARS-CoV-2 specific T-cells in naturally infected participants proliferated more vigorously to *ex vivo* peptide stimulation and maintained broad TCR- β diversity against SARS-CoV-2 antigens both before and after *ex vivo* expansion. Neutralizing antibodies to SARS-CoV-2 were transiently elevated during exercise after both infection and vaccination.

Conclusion: Acute exercise increases immune responses to SARS CoV-2 in naturally infected and vaccinated humans, with broader T-cell responses seen in those with natural infection. It remains to be determined if these immune responses to exercise can facilitate viral clearance and ameliorate symptoms of long COVID syndrome following SARS-CoV-2 infection.

Time: 10:25-10:45

Regular Tai Chi Practice is Associated with Improved Memory as Well as Structural and Functional Alterations of the Hippocampus in the Elderly

Liye Zou¹ Qian Yu

¹*Professor, Psychology, Shenzhen University, China*

Objective: The current study aimed at comparing the effects of Tai Chi (a motor-cognitive exercise) with walking (an exercise without cognitive demands) on cognitive performance, brain structure, and brain function in the elderly.

Methods: This cross-sectional study included 42 healthy elderly women within two groups: Tai Chi (n = 20; mean age = 62.90 \pm 2.38 years) and brisk walking exercise (n = 22; mean age = 63.27 \pm 3.58 years). All the participants underwent a cognitive assessment via the Montreal Cognitive Assessment and brain structural and resting state functional magnetic resonance imaging (rsfMRI) assessments.

Results: Episodic memory in the Tai Chi group was superior to that of the walking group. Higher gray matter density in the inferior and medial temporal regions (including the hippocampus) and higher ReHo in temporal regions (specifically the fusiform gyrus and hippocampus) were found in the Tai Chi group. Significant partial correlations were found between the gray matter density of the left hippocampus and episodic memory in the whole sample. Significant partial correlations were observed between the ReHo in left hippocampus, left parahippocampal, left fusiform, and delayed memory task, which was observed among all subjects.

Conclusion: The present study suggests that long-term Tai Chi practice may improve memory performance via remodeling the structure and function of the hippocampus.

Time: 10:45-11:05

Qigong Exercise Enhances Cognitive Functions in Older People

Tatia M.C. Lee, Ph.D. ¹ Lai-Ping Yuen, M.D., Chetwyn C. H. Chan, Ph.D.

¹*Chair Professor, Psychological Science and Clinical Psychology, Hong Kong University, Hong Kong*

Background: There is strong evidence on the beneficial neurocognitive effects of exercise that protects against cognitive decline. Herein we tested the neurobiological and neurocognitive effects of Qigong on older people.



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Methods: A 12-week randomized active-controlled trial with two study arms was conducted in cognitively healthy older people. Wu Xing Ping Heng Gong (Qigong), which an experienced Daoist Qigong master designed, was applied to the experimental group (n =22) while the physical stretching exercise was applied to the control group (n=26). We measured the levels of ageing-sensitive neurocognitive abilities, serum interleukin-6 (IL-6), and brain structural volumes in the experimental before and after the 12-week training.

Results: We observed that Qigong caused significant improvement in processing speed ($t(46) = 2.03, p = 0.048$) and sustained attention ($t(46) = -2.34, p = 0.023$). Also, there was significant increase in hippocampal volume ($t(41) = 3.94, p < 0.001$) and reduction in the peripheral IL-6 levels ($t(46) = -3.17, p = 0.003$) after the Qigong practice. Moreover, greater reduction of peripheral IL-6 levels was associated with a greater increase of processing speed performance (bootstrapping CI: [0.16, 3.30]) and a more significant training-induced effect of hippocampal volume on the improvement in sustained attention (bootstrapping CI: [-0.35, -0.004]).

Conclusion: These findings altogether offer significant insight into the mechanistic role of peripheral IL-6—and its intricate interplay with neural processes—in the beneficial neurocognitive effects of Qigong.

PK1. Plenary Keynote 1

Time: 11:30-12:10

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Moderator: Jane Pei-Chen Chang, Taiwan

Mind-Body Interventions in Cancer Survivors: Targeting Neuro-Immune Pathways to Promote Well-Being

Julienne E. Bower, Ph.D.

Professor, University of California, Los Angeles, USA

Associate Director, Cousins Center for Psychoneuroimmunology, Semel Institute for Neuroscience and Human Behavior, University of California, Los Angeles, USA

Background and Methods: Advances in detection and treatment have resulted in longer survival for women diagnosed with breast cancer. Many of these women will experience cancer-related symptoms that disrupt quality of life during survivorship, including fatigue, insomnia, and depression. Interventions are required that address these symptoms and their biological correlates. Our research group has developed and tested several mind-body interventions for breast cancer survivors with persistent behavioral symptoms. These include randomized controlled trials examining mindfulness meditation for depression, yoga for fatigue, and Tai Chi for insomnia.

Results: All three mind-body interventions have demonstrated improvements in behavioral symptoms as well as improvements in inflammatory biology. In particular, these interventions have led to reductions in expression of pro-inflammatory genes and inflammatory signaling. In addition, results show that changes in positive psychological states (i.e., eudaimonic well-being) and reward-related neural activity are correlated with changes in immune outcomes following mindfulness meditation.

Conclusions: Evidence from randomized controlled trials indicates that mind-body interventions are effective in reducing behavioral symptoms and inflammatory processes in breast cancer survivors. These trials are also elucidating mechanisms underlying intervention effects, with a focus on positive psychological processes.

S12. PNIRASia-Pacific Session II

Time: 13:30-15:10

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Chair: Sarah J. Spencer, Ph.D.

*Professor and Head, Neuroendocrinology of the Obese Brain Research Group Deputy Leader,
Neurodevelopment in Health and Disease Program School of Health and Biomedical Sciences RMIT University,
Australia*

The Immune System is a Conduit That Links Environmental Stimuli to Brain Function

Session Summary:

A recent review highlighted how the brain regulates the number and function of a variety of cells in the immune system (Nature Reviews.2021, 21:20-36). Equally important is the reciprocal issue of how the immune system affects the brain. A variety of environmental stimuli, ranging from pathogens to stress to cancer, affects cells of both the innate and adaptive immune system. These cells respond in a variety of ways, including informing the brain that a perturbation has occurred somewhere in the body. This symposium features four early career scientists who will describe their newest findings in immune to brain communication. Dr. Adam Walker from the University of New South Wales uses a murine model of breast cancer to investigate the physiological mechanisms that lead to cancer-induced cognitive impairment and anxiety. He will describe how breast cancer causes inflammation in the brain to the same degree as chronic psychological stress. Exciting new data show that microglia are activated in stress neurocircuitry of the brain and that the anti-inflammatory drug aspirin, angiotensin receptor blocker candesartan and the resection of solid tumors inhibit cognitive dysfunction caused by breast cancer. Other types of insults that affect cells of the immune system also led to changes in cognition. New data from Dr. Simone De Luca at RMIT University show that cigarette smoking can disrupt learning and memory. She is exploring how chronic obstructive pulmonary disease (COPD) caused by cigarette smoking leads to cognitive dysfunction. Her newest findings suggest that the oxidative stress and inflammatory events caused by COPD in the lungs leads to inflammation in the brain that impairs cognition. Another environmental insult is overeating, which leads to a rise in obesity. Dr. Luba Sominsky from Barwon Health/Deakin University is investigating the role of inflammation in maternal mood disorders. Her recent preclinical findings show that diet-induced obesity before and during pregnancy induces systemic inflammation, increases microglial activation and disrupts neurogenesis in the postpartum maternal brain. She is now studying how maternal obesity affects postnatal depression and anxiety in human birth cohorts. Dr. Jane Pie-Chen Chang from Taichung, Taiwan will extend these studies on systemic inflammation to humans. Clinical studies have linked biomarkers of systemic inflammation to children with attention deficit disorder (ADHD). She and others have shown that children with ADHD display reduced consumption and low blood levels of n-3 PUFAs. These are both negatively correlated with blood levels of inflammatory proteins. She will summarize the newest results and recommended clinical guidelines on n-3 PUFAs in adolescents with ADHD. Collectively, this symposium will highlight the growing recognition and concept that a variety of environmental insults activates cells of the immune system, leading to systemic inflammation. The increase in both soluble inflammatory proteins and cellular constituents ultimately informs the brain that a perturbation has occurred in the periphery. As such, cells of the immune system are a critical conduit that conveys messages from the environment to the brain.



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Time: 13:35-13:55

The Role of Neuroinflammation in Cancer-Related Cognitive Impairment

Adam K. Walker, Ph.D.

Senior Research Fellow, School of Psychiatry, The University of New South Wales, Australia

Background: >50% of cancer patients have cognitive impairment and anxiety, and we have shown that the cancer itself is responsible. Here we interrogate the biological mechanisms and evaluate treatment responsible for tumour-induced cognitive impairment and anxiety.

Method: We used mouse models of breast cancer and examined memory and anxiety-like behaviour, and markers of neuroinflammation. To evaluate the impact of cancer surgery or the stress of a cancer diagnosis, mice underwent primary tumour resection or chronic restraint stress. Based on clinical findings showing dysregulation of inflammatory pathways and the renin angiotensin system in cancer patients with cognitive impairment, we evaluated the impact of the anti-inflammatory drug aspirin and angiotensin receptor blockers (ARBs) on memory impairment in tumour bearing mice.

Result: Tumours induced memory impairment and anxiety-like behaviour, increased hippocampal pro-inflammatory cytokines and activated microglia throughout memory and stress neurocircuits to the same degree as chronic stress. Aspirin prevented but did not reverse tumour-induced memory impairment and neuroinflammation. We are still evaluating the impact of ARBS on tumour-induced memory impairment. Primary tumour resection improved breast cancer-induced memory impairment, depending on the magnitude of invasiveness of the surgery.

Conclusion: Breast cancer can cause cognitive impairment and anxiety-relevant symptoms to the same degree as chronic stress even before patients know they have cancer. These symptoms may be preventable by generalised anti-inflammatory drugs. Minimal cancer surgeries (e.g. small lumpectomies) may be a viable approach to reverse tumour-induced cognitive impairment, but major surgeries (e.g. mastectomy) are likely to contribute to cognitive impairment in cancer patients.

Time: 13:55-14:15

Nutritional Psychiatry as the Mainstream: Focus on Omega-3 Fatty Acids in ADHD

Jane Pei-Chen Chang, M.D., Ph.D.

Director, Child Psychiatry Division, Department of Psychiatry, CMU Hospital, Taiwan

Director, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

Deficiency of omega-3 polyunsaturated fatty acids (n-3 PUFAs), such as docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), and inflammation have been suggested to play a role in attention deficit hyperactivity disorder (ADHD). Studies have suggested that children with ADHD tend to have less intake and lower blood levels of n-3 PUFAs, and higher inflammatory biomarkers. On the other hand, although some studies reported improvement in clinical symptoms of ADHD with n-3 PUFAs supplementation, usually e DHA, other studies did not have similar findings. This talk will provide a brief overview of the most updated research findings of n-3 PUFAs in ADHD, supported by cross-sectional studies, meta-analyses and randomised controlled trials. A most recently published clinical guideline on n-3 PUFAs in children and adolescents with ADHD will also be highlighted in this talk.

Time: 14:15-14:35

Modulatory Effects of Peri-Pregnancy Diet on the Maternal Brain

Luba Sominsky, Ph.D.

Barwon Health University Hospital; School of Medicine, Deakin University, Geelong, Victoria, Australia

Maternal mood disorders are serious and specific complications of pregnancy experienced by as many as 1 in 5 mothers worldwide. Maternal obesity increases the risk of postpartum mood disorders, but the mechanisms are unknown. Here we examined the effects of maternal obesity, induced by the consumption of a high-fat-high-sugar (HFSD) diet before and during pregnancy on postpartum brain and behaviour in rats. We also assessed if the effects of HFSD could be reversed by consumption of a healthier diet during pregnancy, specifically by a diet high in omega-3 polyunsaturated fatty acids. Our data show that consumption of HFSD before and during pregnancy activated magnocellular, but not parvocellular, neurons in the paraventricular region of the hypothalamus, and only moderately affected anxiety-like behaviours. However, HFSD-induced pre-conception obesity was associated with increased circulating cytokine levels and reduced microglial complexity; morphology indicative of microglial activation. A shift to a healthier diet during pregnancy alleviated systemic and neuro-inflammation. Surprisingly, both HFSD and omega-3-replete diet increased the numbers of immature neurons in the hippocampus. While outside of pregnancy neurogenesis refines hippocampal activity, the opposite occurs postpartum, where increased neurogenesis may facilitate mood disorders. Our findings highlight the potential role of inflammation in mediating the effects of diet on the maternal brain and support the importance of a balanced dietary intake before and during pregnancy. Our data also indicate the need for future research into key triggers that may influence the neuroimmune balance in the maternal brain.

Time: 14:35-14:55

Cigarette Smoke Induced-Cognitive Dysfunction is Associated with Increased Oxidative Stress in the Brain

Simone N. De Luca, Ph.D.

Boehringer Ingelheim Postdoctoral Fellow, RMIT University, Australia

Introduction: Chronic obstructive pulmonary disease (COPD) is the 3rd leading cause of death, with cigarette smoking (CS) being the leading causative factor. People with COPD often suffer from cognitive and mood dysfunction, thereby reducing their quality of life and shortening of life expectancy. However, the mechanism underlying this neuropathology in COPD is unknown. It is believed that increased inflammation and oxidative stress in the lungs may 'spill over' into the systemic circulation, damaging the brain, leading to neurocognitive dysfunction.

Aims: To examine the impact of CS-exposure on neuroinflammation and neurocognitive function and to ascertain whether targeting oxidative stress may prevent the neurocognitive deficits.

Methods: Male BALB/c mice were exposed to CS (9 cigarettes/day, 5 days a week) or room air for 8 weeks with or without the coadministration (oral gavage) of the glutathione peroxidase mimetic, ebselen (10mg/kg). Following 8 weeks CS exposure, we assessed working memory (novel object recognition [NOR] test). We also examined microglial profiles (ionized calcium binding adaptor molecule-1 via immunohistochemistry) and oxidative stress (protein carbonylation and lipid peroxidation via western blot),



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Results: CS-exposure caused working memory impairment ($n=8$; $p=0.004$). CS-exposed mice had a significantly activated microglial profile when compared to air-exposed sham mice ($n=8$; $p=0.001$). In addition, mice exposed to CS also had increased protein carbonylation compared to control mice ($n = 8$; $p = 0.003$), suggesting oxidative stress in the brain. Ebselen completely prevented hippocampal-dependent memory deficits ($n=8$, $p= 0.003$) without altering the activated microglial morphology ($n=8$).

Discussion: Eight weeks of CS-exposure impairs hippocampaldependent memory which is associated with neuroinflammation and heightened oxidative stress. Antioxidant supplementation using ebselen completely prevents the CS-induced memory loss despite neuroinflammation. This study demonstrated that neurocognitive deficits may be disassociated with microglial activation. Targeting oxidative stress may be a viable approach for the prevention of neurocognitive deficits in smokers.

PK2. Plenary Keynote 2

Time: 15:40-16:20

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Moderator: Jane Pei-Chen Chang, Taiwan

The Interplay of Stress, Nutrition, and Inflammation in the Mind-Body Symphony

Kuan-Pin Su, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital, Taiwan

President, Taiwanese Society for Nutritional Psychiatry, Taiwan

Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

The increasing global burden calls for the development of novel approaches to tackle unmet needs in prevention, diagnosis, and treatment of brain disorders underlying biological, psychological and social dysregulations. Clinicians and researchers are facing the huge challenge of developing new approaches for mental disorders despite of the advance of neurosciences. Current psychiatric practice is dominated by the use of pharmacological and psychological therapies; however, the limited therapeutic effects of traditional psychiatric therapies, for example, imply the insufficiency without holistic approach to “tune into mind and body”.

The mainstream (Western) medicine separates mind and body distinctly, to differentiate the specific diagnoses, and to rule out confounding. This approach is powerful to detect small signals of therapeutic effects on specific molecular targets (e.g., pharmaceutical interventions) for a “well-defined” complex disease such as DSM-5 major depressive disorder (M.D.D). The Eastern medicine practitioners, on the other hand, believe that mind and body are inseparable. The goal of Eastern practices, such as diet intervention, mindfulness, herbal medicine, music & art, and even Taichi, are all to bring balance to both the mind and body. In addition to personalized intervention, the Eastern medicine emphasizes on subjective (qualitative/personal) outcomes while the Western Medicine emphasizes on objective (quantitative/measurable) outcomes. Because of these fundamental differences, one can expect that the effect sizes of one single intervention (said, the “cooling down” foods) on one specific manifestation (said, the “on-fire” symptoms) will be much smaller than the “antidepressant agents” on the DSM-5 M.D.D.

There are emerging evidence of the interplay of stress, depression, and Inflammation in health and diseases. Here, I'd like to discuss the critical needs of more translational research and invite more physician scientists play in the mind-body symphony.

S13. 5-min Poster Blitz

Time: 16:20-17:00

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

-
- 5PB001 Association between Kawasaki Disease in Childhood and Psychiatric Disorders: A Population-Based Cohort Study
Tzu-Li Chen, Taiwan
-
- 5PB003 The Healing Power of Dancing Together - A Narrative Study of Dance Movement Therapy Group for People with Dementia
Yin-Hui Hong, Taiwan
-
- 5PB004 The Anti-Obesity and Anti-Depressant Effects Evaluation of Korean Red Ginseng Extract in High-Fat Diet with an Unpredictable Chronic Mild Stress-Induced Obesity and Depression Mice Model
Hsin-Chen Tsai, Taiwan
-
- 5PB006 Omega-3 Fatty Acids on White Matter Hyperintensity and Cognitive Impairment in Patients with Vascular Depression
Shih-Chun Meng, Taiwan
-
- 5PB007 A Systematic Review of Adverse Childhood Experiences and Resilience on High-Risk Behavior, Emotional and Somatic Symptoms
Chia-Yu Chen, Taiwan
-



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Interaction with Speakers of Educational Workshop 1, 2 & 3 (in Mandarin)

Time: 17:00-18:30

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Time: 17:00-17:30

Workshop 3: Core Curriculum on Nutritional Psychiatry (營養精神醫學核心課程)

Organizer: Jane Pei-Chen Chang, M.D., Ph.D.

Director, Child Psychiatry Division, Department of Psychiatry, CMU Hospital, Taiwan

Director, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

Organized by Dr. Jane Pei-Chen Chang, this educational workshop aims to provide a core curriculum on nutritional psychiatry. The workshop will be compiled by eight topics delivered by experts from Taiwan. The essence of this workshop is to serve as the foundation of nutritional psychiatry. With an interdisciplinary approach of research to integrate biomedical discovery and development, the enhancements of nutritional medicine in the prevention, concurrent treatment and wellbeing of mental health will be promoted.

此教育工作坊由台灣營養精神醫學研究學會張倍禎理事召集，邀請國內八位專家在課程講授大腦營養醫學核心知識。本工作坊的目的在提供有興趣進入該領域的專業人員最新知識以及未來實作演練的基礎。本課程以線上學習、播放預錄影片方式進行，提供最有效率的教育訓練。大會活動期間學員能與專家主講人進行線上互動，課程結束後亦將提供醫事人員繼續教育積分及上課證明。

Speakers

Li-Ren Chang, M.D.

Adjunct lecturer, Medical College, National Taiwan University, Taiwan

Jane Pei-Chen Chang, M.D., Ph.D.

Director, Child Psychiatry Division, Department of Psychiatry, CMU Hospital, Taiwan

Director, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

Chih-Kun Huang, M.D.

Superintendent, BMI Medical Center, China Medical University, Taiwan

Ying-Chieh Tsai, Ph.D.

Chair Professor, National Yang Ming Chiao Tung University, Taipei, Taiwan

Lee-Yan Sheen, Ph.D.

Distinguished Professor, National Taiwan University, Taiwan

Cherry Hui-Chih Chang, Ph.D.

Secretary-General, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

Researcher, Mind-Body Interface Center, CMU Hospital, Taiwan

I-Chi Cheng, M.S.

Supervisor, Dietitian, Chinese Taipei Society for the Study of Obesity, Taiwan

Hui-Ting Yang, Ph.D.

Associate Professor, Taipei Medical University, Taiwan

Time: 17:30-18:00

Workshop 2: Clinical Workshop for Transcranial Magnetic Stimulation (TMS臨床實務工作坊)

Organizer: Galen C.L. Hung, M.D.¹ and Kuan-Pin, M.D., Ph.D.²

¹ Taipei City Psychiatric Center, Taipei City Hospital

² Professor & Director, Mind-Body Interface Laboratory, CMU Hospital

² President, Taiwanese Society for Nutritional Psychiatry

In the 11th MBI International Conference we will launch a much-anticipated educational workshop. Eight renowned TMS experts in Taiwan will provide core teachings of basic TMS principles. The essence of rTMS principles will be compiled by these clinical experts, which will serve as the foundation of academic and clinical application of rTMS. This workshop also provides essential knowledge for the advanced hands-on training.

此教育工作坊邀請台灣在rTMS治療上最專精的八位臨床專家，課程以中文進行。透過國內臨床專家所精萃的rTMS核心知識，提供對rTMS臨床操作及研究有興趣的醫事人員最有效率的教育訓練。該工作坊亦涵蓋未來rTMS實作演練課程前之必備核心知識。本課程以線上學習、播放預錄影片的方式進行，大會活動期間學員能與專家主講人進行線上互動，課程結束後亦將提供醫事人員繼續教育積分及上課證明。

Speakers

Te-ho Wu, Ph.D.

Professor, Graduate School of Materials Science, National Yunlin University of Science and Technology, Douliu, Taiwan

Kuan-Pin Su, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital, Taiwan
President, Taiwanese Society for Nutritional Psychiatry, Taiwan
Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

Hsin-An Chang, M.D.

Chief, Division of Child and Adolescent Psychiatry, Department of Psychiatry, Tri-Service General Hospital, Taiwan

Cheng-Ta Li, M.D., Ph.D.

Division Chief, Taipei Veterans General Hospital, Taiwan

Ming-Kuei Lu, M.D., Ph.D.

Associate Professor, Ph.D. Program for Translational Medicine, College of Medicine, China Medical University, Taiwan
Attending Physician, Department of Neurology, CMU Hospital, Taiwan

Tze-Chun Tang, M.D., Ph.D.

President, Tang's Psychiatric Clinic and Mind Center, Taiwan

Cheng-Ruey Jou, M.D.

Visited Staff, Blossom Clinic of Psychosomatic Medicine, Taiwan

Galen C.L. Hung, M.D.

Chief, Blossom Clinic of Psychosomatic Medicine, Taiwan
Chair, Taiwan Allied Clinics for Integrative TMS, Taiwan



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Time: 18:00-18:30

Workshop 1: Core Curriculum on Depression for Clinical Researchers **(憂鬱症研究核心課程)**

Organizer: Kuan-Pin, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital

President, Taiwanese Society for Nutritional Psychiatry

Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

Organized by Prof. Kuan-Pin Su, this educational workshop aims to provide a core curriculum on depression for clinical researchers. The workshop will be compiled by eight topics delivered by experts from Taiwan. The course is conducted in Mandarin. The essence of this workshop is to serve as the foundation of translational neuroscience. With an interdisciplinary approach of research to integrate biomedical discovery and development, the enhancements of prevention, diagnosis, and therapies in depression will be promoted.

此教育工作坊是由蘇冠賓教授召集台灣在憂鬱症領域最專精的八位臨床專家，主講憂鬱症研究的核心知識，是對大腦神經精神醫學轉譯研究入門的核心基礎課程。課程以中文進行，提供最有效率與優質的教育訓練課程。本課程以線上學習、播放預錄影片的方式進行，大會活動期間學員能與專家主講人進行線上互動，課程結束後亦將提供醫事人員繼續教育積分及上課證明。

Speakers

Kuan-Pin Su, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital, Taiwan

President, Taiwanese Society for Nutritional Psychiatry, Taiwan

Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

Yan-Guang Yang, M.D.

Professor, Institute of Behavioral Medicine, National Cheng Kung University, Taiwan

Superintendent, Tainan Hospital, Ministry of Health and Welfare, Taiwan

Tze-Chun Tang, M.D., Ph.D.

President, Tang's Psychiatric Clinic and Mind Center, Taiwan

Shih-Ku Lin, M.D.

Associate Professor, Linkou Chang Gang Memorial Hospital, Taiwan

Po-Han Chou, M.D., MPH.

Attending Physician, Department of Psychiatry, CMU Hsinchu Hospital, Hsinchu, Taiwan

Jane Pei-Chen Chang, M.D., Ph.D.

Director, Child Psychiatry Division, Department of Psychiatry, CMU Hospital, Taiwan

Director, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

Kai-Chun Yang, M.D., MSc, Ph.D.

Consultant Psychiatrist, CMU Hospital, Taichung, Taiwan

Dinner and Award Ceremony

Time: 18:30-20:30

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Dinner Speech by Symposium Chairman

Prof. Kuan-Pin Su, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital

President, Taiwanese Society for Nutritional Psychiatry

Deputy Superintendent, An-Nan Hospital, China Medical University, Taiwan

Award Ceremony by Scientific Committee Chairman

Dr. Jane Pei-Chen Chang, M.D., Ph.D.

Director, Child Psychiatry Division, Department of Psychiatry, CMU Hospital, Taiwan

Director, Taiwanese Society for Nutritional Psychiatry Research, Taiwan

✧ Best Poster Award

Presented by: Dr. Jane Pei-Chen Chang

✧ Poster Blitz Award

Sponsored by Nutrarex Biotech

Presented by: Dr. Jane Pei-Chen Chang

✧ Young Researcher Award

Sponsored by Nutrarex Biotech

Presented by: Prof. Kuan-Pin Su



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Program Details

October 31, 2021

S21. Novel Treatment for Depression Session

Time: 09:00-11:00

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Chair: David Mischoulon, M.D., Ph.D.

Professor, Psychiatry, Harvard Medical School, USA

Depression Clinical and Research Program (DCRP), Massachusetts General Hospital

Cutting Edge Therapies for Depressive Disorders: Clinical Efficacy and Mechanisms of Action

Session Summary:

Background: Depressive disorders remain difficult to treat, despite many marketed antidepressants and approved psychotherapies. Given the limitations of efficacy and often bothersome side effects, many individuals will seek alternative approaches.

Methods: The session will review 3 different approaches for managing treatment resistant depression. We will present results from a study of heated Hatha Yoga for individuals with major depressive disorder, including clinical findings and mechanistic findings. We will present findings from a study examining Mentalizing Imagery Therapy (MIT) in individuals acting as caregivers to their relatives with dementia. Finally, we will present findings from one of the few ketamine clinics based in an academic medical center and focused on clinical research as well as care for difficult to treat patients.

Results: Findings for the three different approaches, including mechanistic findings for the heated yoga study, will be presented.

Conclusion: Novel, cutting edge therapies such as heated yoga, mentalizing imagery therapy, and ketamine represent potentially valuable additions to the psychiatric armamentarium and merit further research.

Time: 09:25-09:45

Primary Clinical Outcomes from a Randomized Controlled Trial of Heated Yoga for Depression

Maren Nyer, Ph.D.¹, Megha Nagaswami, BA, Bettina Hoepner, Ph.D., Samuel R. Petrie, BS, Richard Norton, BA, Simmie Foster, M.D., Ph.D., Karen Miller, M.D., Chris Streeter, M.D., Lisa Uebelacker, Ph.D., Maurizio Fava, M.D., David Mischoulon, M.D., Ph.D.

¹ Director, Yoga Studies, Depression Clinical and Research Program Massachusetts General Hospital, Boston MA, USA

¹ Assistant Professor of Psychiatry, Harvard Medical School, USA

Background: Heated Yoga (HY) may represent a promising and innovative treatment approach for major depressive disorder (M.D.D) (1). To date, there has only been one randomized clinical trial (1) and one open

label trial (2) of heated yoga for the treatment of depression. However, there has been randomized controlled trial level evidence that non-heated yoga (3) and whole-body hyperthermia (WBH) (4) independently demonstrate antidepressant effects. The purpose of this study was to investigate the impact of a HY intervention (both yoga + WBH in combination) on depression and related secondary outcomes in a clinical sample with at least mild-to-moderate symptoms of depression.

Methods: This study was a randomized controlled trial of HY versus a waitlist control for 80 adults (aged 18–60) with at least mild-to-moderate depressive symptoms. Patients were randomized to an immediate yoga group or a waitlist control. The HY intervention was delivered at least twice weekly over 8 weeks and followed a standardized protocol. Clinician rated and self-report measures were assessed at regular assessment visits. Attendance was collected via studio attendance data and checked with each participant.

Results: Statistical analyses are currently ongoing; however, the trial found significant effects at the primary 8-week endpoint in the primary outcome, Inventory of Depressive Symptoms – Clinician Rated (IDS-CR): heated yoga end of treatment mean: heated yoga mean (SD) = 17.9 (12.7); waitlist control end of treatment mean = 29.6 (9.6), $p > .001$. The full findings from these clinical outcomes will be presented at the symposium. The relationship between clinical outcomes and frequency of attendance will also be presented.

Conclusion: HY improved depressive symptoms in patients with at least mild-to-moderate symptoms of depression in this randomized clinical trial. Further analyses will be reported and explored in the presentation.

Time: 09:45-10:05

Biological Findings from a Randomized Controlled Trial of Heated Yoga for Depression

Samuel R. Petrie, BS¹, M. C. Flux, Ph.D., Megha Nagaswami, BA, Richard Norton, BS, Aava Jahan, BS, Lyanna R. Kessler, BS, Lauren M. Sandal, BA, Brandon M. Marquart, MS, Maurizio Fava, M.D., Simmie Foster, M.D., Ph.D., Karen K. Miller, M.D., Chris Streeter, M.D., Stefania Lamon-Fava, M.D., Ph.D., Christopher A. Lowry, Ph.D., David Mischoulon, M.D., Ph.D., Maren Nyer, Ph.D.

¹ *Fourth Year Medical Student, Harvard Medical School*

Background: Heated Yoga (HY) is a promising novel treatment approach for major depressive disorder (M.D.D). The biological mechanisms of HY for M.D.D are still not fully understood. It is possible that HY's antidepressant effect is due in part to improved regulation of glucocorticoids and inflammation, which are dysregulated in depression. Non-HY and HY improve regulation of cortisol, a glucocorticoid that is a marker of activation of the stress-related hypothalamic-pituitary-adrenal (HPA) axis. Non-HY practice also reduces levels of pro-inflammatory biomarkers such as IL-1-beta, IL-6, TNF, and CRP. The purpose of this study was to investigate the impact of a HY intervention on several biomarkers in a clinical sample with at least moderate symptoms of depression.

Methods: This study was a randomized controlled trial of HY versus a waitlist control for 80 adults with at least moderate depressive symptoms. Patients were randomized to an immediate yoga group or a waitlist control. The HY intervention was delivered at least twice per week over 8 weeks and followed a standardized protocol. Plasma inflammatory markers, salivary cortisol, and clinical outcome measures were collected at regular assessment visits.

Results: Statistical analyses are currently ongoing, and the findings for inflammatory markers and salivary



cortisol will be presented at the symposium. The relationship between these markers and improvement in depressive symptoms will be explored and presented.

Conclusion: HY may impact regulation of glucocorticoids and inflammation in depressed patients. These systems may shed light on the biological underpinnings of the antidepressant effects of HY.

Time: 10:05-10:25

Randomized Controlled Trial of Mentalizing Imagery Therapy for Family Dementia Caregivers: Clinical Effects and Brain Connectivity Changes

Felipe Jain, M.D.¹, Sergey Chernyak, Ph.D., David Mischoulon, M.D., Ph.D., Liliana Ramirez Gomez, M.D., Albert Yeung, M.D., ScD

¹ Assistant Professor of Psychiatry, Harvard Medical School, USA

¹ Director of Healthy Aging Studies, Depression Clinical and Research Program, Massachusetts General Hospital, USA

Background: Family caregivers of patients with mental disorders suffer from a high burden of depression and stress, in part due to difficulty mentalizing (understanding the mind of) the care recipients. Mentalizing Imagery Therapy (MIT) encodes principles of mentalizing into mindfulness and guided imagery skills training, directly targeting relationship stressors. We conducted the first randomized controlled trial (RCT) of MIT to study its effects on psychological symptoms and resting brain connectivity. Based on a pilot feasibility study, we hypothesized that MIT would reduce psychological symptoms and improve positive traits in family dementia caregivers more than psychosocial support, and that increased dorsolateral prefrontal cortex (DLPFC) connectivity would be associated with improvement in depressive symptoms.

Methods: An RCT was performed of a 4-week MIT group versus a support group (SG). 46 caregivers were randomly assigned to MIT or SG. Questionnaires were obtained at baseline, 1-week post-intervention, and 4 months. Resting state functional magnetic resonance imaging was obtained pre and post treatment. The pre-specified primary outcome was change in self-rated depression. Secondary measures included clinician-rated depression, perceived stress, anxiety, caregiver burden, mindfulness and well-being. Intention to treat analyses were conducted with mixed linear models. DLPFC connectivity was estimated with independent component analysis and dual regression. Non-parametric t-tests assessed change in connectivity, and partial correlations were used to associate DLPFC connectivity change with symptom change.

Results: MIT was significantly superior to SG in improving self-reported and clinician-rated depression, perceived stress, mindfulness and well-being, with lasting effects at 4-month follow-up ($p < .05$). DLPFC connectivity with an emotion regulation network (consisting primarily of dorsomedial prefrontal cortex, ventrolateral prefrontal cortex, and regions of cerebellum) increased in MIT but not SG, and was associated with reduction in depression symptoms and improvements in mindfulness ($p < .025$ for both).

Conclusions: MIT showed promise for reducing negative psychological symptoms and improving positive psychological traits in caregivers. Exactly replicating findings from our previous feasibility study, increased connectivity of DLPFC with an emotion regulation network was uniquely found with MIT. The pattern of connectivity change indicated that MIT facilitated greater cognitive regulation of emotions, and that this might be mechanistically related to the salutary effects of MIT.

Time: 10:25-10:45

Ketamine and Esketamine - from Research to Clinical Practice

Cristina Cusin, M.D.

Associate Professor, Psychiatry, Harvard Medical School, USA

Director, Translational Studies, Depression Clinical and Research Program, Massachusetts General Hospital, USA

Background: Ketamine, an N-methyl-D-aspartate receptor antagonist, has been shown to be an effective treatment for patients with treatment-resistant depression (TRD) and suicidal ideation. Multiple clinical trials have demonstrated that subanesthetic doses of intravenous ketamine have rapid-acting antidepressant effect. Based on these research findings, academic clinics and outpatient ketamine clinics began to offer ketamine treatment as off-label intervention for TRD. However, only a few reports have examined the long-term outcome of maintenance ketamine treatment.

Methods: We opened Ketamine Clinic for Depression at Massachusetts General Hospital in 2018 and we have treated over 250 patients, for a total of over 2200 infusions. At MGH ketamine treatment is offered to patients with severe and refractory M.D.D or Bipolar, while patients with history of psychosis or current substance use disorder are not eligible for ketamine treatment. After psychiatric consultation and medical assessment, patients review and sign a consent for ketamine treatment which that emphasizes that this treatment ketamine is not approved by the US FDA and it provided off-label for depression, in addition to potential risks and benefits. Insurance cover the treatment for about 50% of patients. At each visit, patients are evaluated and monitored by a staff psychiatrist and the infusions are monitored by a nurse. Symptom severity before administration is evaluated with the 16-item Quick Inventory of Depressive Symptomatology-Self Report scale (QIDS-SR16) at every visit and Clinical Global Impression-Severity/Improvement scales (CGI-S/I), before administration and at every subsequent visit. The initial ketamine dose is usually 0.5 mg/kg infused over 40 minutes. Depending on response and tolerability, the dose can be adjusted individually. Intravenous ketamine is administered with a twice-weekly schedule of twice a week for three weeks for as an induction phase, followed by maintenance with variable administration schedule (i.e. twice a week to every 12-6 weeks) based on duration of effect. Other pharmacological and psychotherapeutic treatments are continued as part of the usual regimen. Common side effects are nausea, confusion, dizziness, drowsiness and these effects subside within 30-40 minutes after the infusion.

Results: During the symposium we will discuss the response rate observed in our clinical practice and discuss the challenge of working with an extremely ill group of patients, including the management of concomitant medications and risk of suicidality. We will present the analyses of possible predictors of response to ketamine.

Conclusion: For patients not covered by insurance, the high cost of repeated intravenous ketamine treatments is a major contributor to early discontinuation if the perceived benefit is not sufficient to justify continuing with ketamine treatment. Yet, for a significant proportion of patients, ketamine represents an ideal option, as it is well tolerated and efficacious, with an antidepressant effect lasting for weeks, therefore allowing the patients to resume the prior level of functioning.



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Mind-Body Interface Symposium

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S22. Meet the Expert

Time: 11:10-11:40

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Moderator: Kuan-Pin Su

Murine and Human Microglial Cells are Relatively Enriched with Eicosapentaenoic Acid Compared to the Whole Brain

Richard Bazinet, Ph.D., Canada

Professor, Department of Nutritional Sciences, University of Toronto, Canada

Canada Research Chair, Brain Lipid Metabolism

Immediate Past President, International Society for the Study of Fatty Acids and Lipids (ISSFAL)

The brain is a multicellular organ enriched with lipids. While the fatty acid composition of gross cerebral tissue is well characterized, the fatty acid composition of specific brain cells, particularly microglia cells, is less well characterized. Microglia cells are the innate immune cells of the brain, and a paucity of studies measuring their fatty acid composition using either immortalized or primary microglia cells report a higher ratio of eicosapentaenoic acid (EPA) to docosahexaenoic acid (DHA) than widely observed in whole brain tissue. Here we further characterize the fatty acid composition of murine microglia cells from young male and female mice as well as of human origin and compared it with a myelin-enriched fraction from the same mice. Our results show that saturated and monounsaturated fatty acids are the most abundant followed by polyunsaturated fatty acids (PUFA), with no statistical differences between the sexes. Regarding PUFA, although DHA levels did not differ between human and murine cells, EPA was statistically higher in murine microglia. Notably, the DHA to EPA ratio was about 400 times higher in microglial cells compared to the myelin-enriched fraction. Thus, our results suggest that as compared to whole brain tissue EPA is relatively abundant in microglia cells, particularly in comparison to other n-3 PUFA such as DHA. Since the fatty acid composition of microglia can influence their functionality, a better understanding of EPA and DHA metabolism in microglia and the brain could identify new targets to modify microglial activity.

S23. Selected Oral Presentation

Time: 13:30-14:10

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Moderator: Jane Pei-Chen Chang

Time: 13:30-13:50

Prefrontal Cortical Activity Predicts Therapeutic Effects of Repetitive Transcranial Magnetic Stimulation in Major Depression: A Near-Infrared Spectroscopy

Po-Han Chou, M.D., MPH.

Attending Physician, Department of Psychiatry, CMU Hsinchu Hospital, Hsinchu, Taiwan

Aim and objectives: There has been is strong evidence that repetitive transcranial magnetic stimulation (rTMS) applied to the left dorsolateral prefrontal cortex (DLPFC) has antidepressant effects in treating major depressive disorder (M.D.D). However, there is still lacking of clinically applicable neuroimaging biomarkers to predict treatment response of rTMS. The aim of this study was to investigate the associations between brain activity measured by near infrared spectroscopy (NIRS), a functional neuroimaging tool, and symptom changes in M.D.D patients.

Method: Twenty-six patients diagnosed with M.D.D (DSM-5) received 10 Hz rTMS (3000 pulses, 110% RMT) on the left DLPFC for 20 sessions. Brain frontal cortical activity during a verbal fluency task (VFT) was measured by fNIRS at baseline, after 10th rTMS sessions, and 20th rTMS sessions. Response was defined as decrease in 17 item Hamilton Depression Rating Scale (HAM.D.-17) more than 50%.

Results: After 20 sessions of rTMS treatment, there were 14 responders and 12 non-responders. Compared to no-responders, there are significant increased brain frontal cortical activity observed in the prefrontal cortex both after 10th and 20th sessions related to baseline activity ($p=0.005$). Moreover, in responders, increased in frontal lobe activity is significantly associated with improvement in depressive symptoms at 10th ($r=-0.868$, $p=0.0001$) and 20th sessions ($r= - 0.682$, $p=0.007$). On the other hand, among non-responders, frontal lobe activity is not significantly associated with improvement in depressive symptoms at 10th ($r=-0.326$, $p=0.301$) but significantly associated with symptom changes after 20th sessions ($r= - 0.743$, $p=0.006$). Furthermore, in responders, increased frontal activity was significantly associated with improvement in depressive symptoms after 20 sessions of rTMS ($r= - 0.756$, $p=0.001$), while this association was not observed in non-responders ($r=-0.153$, $p=0.634$).

Conclusion: Our study demonstrated differences in brain cortical activity patterns between responders and non-responders after 20 sessions of rTMS treatment. Our results indicated that NIRS could be a potential biomarker to predict rTMS treatment responses in M.D.D patients.



Time: 13:50-14:10

Cognitive Biases Predict Worry and Anxiety During Examinations and COVID-19 Pandemic - A UK Sample

Ya-Chun Feng, Ph.D.

Assistant Professor, National Sun Yat-sen University, Kaohsiung, Taiwan

Background: Worry is a stream of negative thoughts about future events and can be maintained by the consistent tendencies to attend to threatening information (i.e., negative attention bias) and interpret ambiguities negatively (i.e., negative interpretation bias). At present, it is unclear whether memory bias under the influences of interpretations (i.e., interpretation-memory) is involved in the underlying cognitive mechanisms of worry, and how cognitive biases work together in association with worry. The nature of cognitive biases in predicting worry is also under-investigated. Besides, previous research has not identified whether the same cognitive biases predict worry when individuals cope with different stressors.

Method: To address these research gaps, the current study invited 64 first-year undergraduates to complete one lab session (Phase 1) with multiple cognitive assessments and two follow-up phases (Phase 2 and 3) with online measures during the examination period and the first lock-down in the UK. Given that worry is a core symptom of generalised anxiety disorder, anxiety was also assessed to compare the results. We investigated what cognitive biases are associated with worry together (Phase 1). We also investigated what cognitive biases predict worry and anxiety when individuals faced examinations (Phase 2, n=55), and when they were under the impact of the COVID-19 pandemic (Phase 3, n=49).

Result: The findings showed that greater benign interpretation bias and interpretation-memory bias were associated with lower levels of worry and anxiety. Only interpretation bias provided unique variance in explaining worry and anxiety, indicating that interpretation bias is the main factor contributing to the current worry. However, no cognitive bias provided unique variance in worry under examinations when initial worry was controlled (Phase 2). In contrast, interpretation bias still provided unique variance in anxiety, indicating the potential different mechanisms between worry and anxiety. When under the influence of the COVID-19 pandemic (Phase 3), greater benign attention bias and interpretation-memory bias predicted lower worry and anxiety levels. Both attention bias and interpretation-memory bias provided unique variances in predicting worry when initial worry was controlled.

Conclusion: The study extends the understanding of the longitudinal relationship between cognitive processes and worry and anxiety, and how multiple cognitive processes operate in predicting anxiety and worry. The findings indicate that individuals with certain benign cognitive biases are more resilient in the stress of academic and pandemic. Preventives and interventions for worry and anxiety may need to consider the upcoming stressful events and target those cognitive biases to reduce potential high levels of worry and anxiety.

PK3. Plenary Keynote 3

Time: 14:10-14:50

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Moderator: Po-Han Chou

Transcranial Magnetic Stimulation: Towards Personalized Neuromodulation in Mental Health

Alexander T. Sack, Ph.D.

Professor, Brain Stimulation and Applied Cognitive Neuroscience at Maastricht University, Netherlands

Background: Transcranial magnetic stimulation (TMS) is arguably the most versatile noninvasive neuromodulation technique. Simply put, TMS is the transcranial delivery of magnetic pulses to a brain region, inducing electric current that can depolarize neurons and induce action potentials. When multiple electromagnetic pulses are applied repetitively (rTMS) to the brain, longer-lasting neuroplastic changes can be induced. TMS has been used extensively in cognitive neuroscience to study the functional role of specific brain regions and networks for various cognitive behaviors in healthy human volunteers. In addition, it is increasingly used in clinical practice for treating various mental disorders, for example, as a new non-pharmacological alternative for patients diagnosed with treatment-resistant-depression (TRD). I will mainly give a general overview on TMS and its promising clinical applications in psychiatry, neurology, and neurorehabilitation. Based on this review regarding the state-of-the art of TMS therapy approaches, I will propose to further increase its clinical efficacy by personalizing the TMS treatment protocols.

Methods: For personalizing TMS, it is vital to first understand which network effects are induced by magnetic brain stimulation. Combining neuroimaging with brain stimulation can visualize such stimulation-induced network effects in the brain. However, concurrent TMS-fMRI studies, e.g., cannot capture the fast temporal dynamics of ongoing neural communication within and between such interconnected networks. Even during rest, there is continuous coupling and uncoupling of functional networks, resulting in ongoing fluctuations in brain states. It is therefore crucial to interpret TMS-induced network activations in a temporal context. Measuring this temporal context using EEG in addition to fMRI during TMS may allow to better understand how oscillations and brain-wide network dynamics interrelate.

Results: I will present a pioneering approach developed by my lab which allows for concurrent TMS+EEG+fMRI measurements in order to study how the exact individual location as well as individual oscillatory brain state affect the signal propagation of TMS within targeted networks in the brain.

Conclusion: Optimizing and controlling TMS-induced network effects will enable us to develop and evaluate innovative yet practically feasible therapeutic TMS protocols that replace the current one-size-fits-all approach by adaptive personalized brain stimulation for patients suffering from various neuropsychiatric disorders.



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S24. Nutritional Psychiatry Session

Time: 15:30-16:30

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Chair: Wolfgang Marx, Ph.D.

Alfred Deakin Postdoctoral Research Fellow of Department of Medicine, Deakin University, Australia

Time: 15:35-15:55

Stress Early in Life and Long-Term Alterations in the Inflammatory System and in the Gut Microbiome

Composition: Implications for Psychiatric Disorders

Annamaria Cattaneo, Ph.D.

Assistant Professor, dept of Pharmacological and Biomolecular Sciences, University of Milan, Italy

Head, Biological Psychiatry Laboratory, IRCCS Institute, Fatebenefratelli Centre, Brescia, Italy

Early life stress, especially when experienced during the first period of life, affects the brain developmental trajectories leading to an enhanced vulnerability for stress-related psychiatric disorders later in life. Although both clinical and preclinical studies clearly support this association, the biological pathways deregulated by such exposure, and the effects in shaping the neurodevelopmental trajectories, have so far been poorly investigated. Inflammation has been suggested to mediate the effect of early life stressful event such as childhood trauma on the development of depressive symptoms, as higher levels of pro-inflammatory cytokines have been found in depressed patients with early life stress as compared with non-exposed depressed patients. Interestingly, childhood trauma is strongly associated with a non-response to antidepressant drugs and it is believed that the presence of an enhanced pro-inflammatory status represents the biological substrates underlying such association. Indeed, higher levels of inflammation are observed in non-responder patients and represents a strong biological predictor, when measured at baseline, of the future response to treatment. Recently, also the gut microbiota has been proposed to act on the interplay between the stress response, brain functions and immune system, through the gut-brain axis communication. Bacteria products strongly influence the human host's physiology and pathology, including brain and immune system development, maturation, and regulation. For instance, the complete lack of microorganisms in germ free (GF) mice has been reported affecting brain size, neurotransmission, behavior and activation of the HPA axis, suggesting that the presence of microorganisms is crucial for proper developmental trajectories and is essential for the establishment of a regular response to stress.

In relation to the possible effect of stress on microbiota composition, several preclinical studies mimicking the early life stress condition showed that stress affect brain functioning via bacteria, with an effect that persist later in life. Also, our group, by using the model of social isolation in rats during adolescence where we collected fecal samples at different post-natal days have been able to investigate the short- and long-lasting effects of stress on gut microbiota composition and also inflammatory and microglia activation related markers in the brain. I will show for example that microbial changes are influenced by age in both stressed and controls rats, regardless of sex, whereas stress impacted the microbial composition in a sex-dependent manner. We also found that stress induced short-term gut microbiota alterations in females, but not in males. In brain areas such exposure is associated with a specific inflammatory pattern, in dorsal and ventral hippocampus, that significantly correlated with gut microbiota composition.

Overall, both immune system and the gut microbiome represent possible novel targets to potentially improve the outcomes in these life-changing disorders. Transferring this understanding to the humans is challenging but promises to reveal how manipulation of the gut microbiota and the inflammatory systems might be keys to understand neurodevelopment, the aging mechanisms and to develop novel preventive targeted therapies.

Time: 15:55-16:05

Assessing the Interplay between Ultra-Processed Foods Consumption and Indicators of Inflammation and Depression

Melissa Lane

Ph.D. Candidate, Deakin University, IMPACT (the Institute for Mental and Physical Health and Clinical Translation), Food & Mood Centre, School of Medicine, Barwon Health, Geelong, Australia

Background: Chronic low grade inflammation may mediate the association between ultra-processed foods intake and the common mental disorder depression.

Method: In accordance with PRISMA reporting guidelines, we conducted a systematic review and meta-analysis that examined possible prospective associations between ultra-processed foods intake and depression in adults. We have conducted further observational analysis in nationally representative datasets to explore this association further.

Results: Based on our systematic review and meta-analysis (N=41,000), ultra-processed foods intake was also prospectively associated with a 22% increased risk of developing future depression (hazard ratio: 1.22; 95% CI, 1.16-1.28, $p < 0.001$). We have since conducted further observational analysis of large cohort datasets that provides further support for this association. Furthermore, we have identified a number of biological pathways such as the microbiome that may be implicated in this association.

Conclusion: Our research supports the hypothesis that chronic low-grade inflammation marked by the presence of elevated inflammatory cytokines may be central to the interacting mechanisms of action driving the link between ultra-processed foods intake and depression.

Time: 16:05-16:15

Polyphenols as Novel Dietary Interventions for Depression: Exploring the Efficacy, Safety and Implicated Mechanisms of Action

Elizabeth Gamage

Ph.D. Student, Deakin University, IMPACT (the Institute for Mental and Physical Health and Clinical Translation), Food & Mood Centre, School of Medicine, Barwon Health, Geelong, Australia

Background: Polyphenols, compounds found abundantly in herbs, spices, fruits, and vegetables, may exert antidepressant effects by targeting several mechanisms implicated in depression (1). The aim of this review is to comprehensively assess the relationship between polyphenols and depression using pre-clinical animal models as well as preliminary observational and interventional human studies.

Methods: This narrative review includes a systematic search strategy conducted using a series of databases from inception to July 2021. Eligible articles include animal studies, observational studies, and randomised controlled trials. Systematic reviews and meta-analyses of human intervention studies were also included.



Results: The literature search identified 4832 articles to be screened. Preliminary synthesis of studies using animal models suggests that polyphenol interventions reduce depressive-like behaviours. While human intervention trials are limited, observation studies focusing on whole-of-diet support this correlation. Implicated mechanisms of action include the modulation of the gut microbiome and anti-inflammatory pathways. A finalised abstract will be provided prior to the conference with full details of the results.

Conclusion: Understanding the association between polyphenols and depression as well as the associated mechanisms will provide insight into novel dietary interventions for the management and treatment of depression. However, future human intervention studies are required to further understand the association between polyphenols and depression.

Time: 16:15-16:25

The Effects of Surgery on Plasma Vitamin C Concentrations and Cognitive Function

Nikolaj Travika

Executive Dean Post-doctoral Research Fellow, Food and Mood Centre, Deakin University, Food and Mood Centre, Deakin University, IMPACT – the Institute for Mental and Physical Health and Clinical Translation, Australia

Background: Post-operative cognitive dysfunction (POCD) is characterised by a significant cognitive impairment following a surgical intervention, affecting an estimated 35% of non-cardiac surgical patients. Based on 50 studies, our recent systematic review demonstrated a link between neurodegenerative diseases such as dementia and inadequate plasma vitamin C.

A cross-sectional study further showed an association between plasma vitamin C concentrations and cognitive function, with higher concentrations correlating with higher cognitive performance in healthy participants. The aim of the present study was to determine whether post-operative changes in plasma vitamin C concentrations may be associated with POCD.

Methods: We conducted a meta-analysis which examined the degree and longevity of changes in post-operative plasma vitamin C concentrations based on collated study results. In addition, we conducted a case study on a 72-year-old male who underwent total knee replacement surgery. Cognition and plasma vitamin C were concurrently assessed during the first post-operative week (post-operative days 3 and 7), and 3 and 6 months post-operatively. Cognition was assessed using a number of validated paper and pen assessments.

Results: Based on twenty-three studies, our meta-analysis results revealed a significant depletion (39%) ($p < 0.001$) in short-term (7 days) post-operative plasma vitamin C concentrations following a range of surgeries. The mean plasma vitamin C concentrations following surgery were indicative of inadequate concentrations. However, a lack of studies assessed post-operative concentrations beyond the first week. Case study results showed a profound decline in plasma vitamin C concentrations which were primarily observed on the third (-92%) and seventh (-81%) postoperative days which was representative of severe deficiency. During these time points, compromised cognitive function was observed on short term and long-term recall, attention and focus, based on the cognitive assessments. Importantly, no changes were observed in serum vitamin B12 concentrations, nutritional intake, sleep quality, pain and mood during the post-operative period.

Conclusion

Based on our meta-analysis, previous studies have systematically demonstrated significant post-operative plasma vitamin C depletions, particularly during the first post-operative week.³ Results derived from the case-study are the first findings to indicate that there may be a possible association between post-operative plasma vitamin C depletion and a cognitive decline, particularly during the first post-operative week.⁴ We are currently undertaking a prospective cohort study recruiting patients undergoing a range of non-cardiac surgeries. These patients are having their cognitive function and plasma vitamin C assessed

PK4. Plenary Keynote 4

Time: 16:30-17:10

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Moderator: Kuan-Pin Su

A Gut Feeling About the Brain: Microbiome & Mental Health

John F. Cryan, Ph.D.

Vice President for Research & Innovation, University College Cork, Cork, Ireland

The microbiota-gut-brain axis is emerging as a research area of increasing interest for those investigating the biological and physiological basis of neurodevelopmental, age-related and neurodegenerative disorders. The routes of communication between the gut and brain include the vagus nerve, the immune system, tryptophan metabolism, via the enteric nervous system or via microbial metabolites such as short chain fatty acids. These mechanisms also impinge on neuroendocrine function at multiple levels. Studies in animal models have been key in delineating that neurodevelopment and the programming of an appropriate stress response is dependent on the microbiota. Developmentally, a variety of factors can impact the microbiota in early life including mode of birth delivery, antibiotic exposure, mode of nutritional provision, infection, stress as well as host genetics. Stress can significantly impact the microbiota-gut-brain axis at all stages across the lifespan. Recently, the gut microbiota has been implicated in a variety of conditions including obesity, autism, schizophrenia and Parkinson's disease. Moreover, animal models have been key in linking the regulation of fundamental brain processes ranging from adult hippocampal neurogenesis to myelination to microglia activation by the microbiome. Finally, studies examining the translation of these effects from animals to humans are currently ongoing. Further studies will focus on understanding the mechanisms underlying such brain effects and developing nutritional and microbial-based intervention strategies.



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Closing Remark

Time: 17:10-17:30

Venue: Meeting Room East, 4F, Windsor Hotel, Taichung

Closing Remark by Symposium Chairman

Prof. Kuan-Pin Su, M.D., Ph.D.

Professor & Director, Mind-Body Interface Laboratory, CMU Hospital

President, Taiwanese Society for Nutritional Psychiatry

Deputy Superintendent of An-Nan Hospital, China Medical University, Taiwan

Awards

Best Poster Award

Presented by: Dr. Jane Pei-Chen Chang

Dysregulation of Leptin-Modulated Corticostriatal Circuitry and Altered Dietary Decision-Making Behavior in Bipolar Disorder

Shyh-Yuh Wei, Taiwan

The Effect of Music Therapy for Children on Pain Release: A Systematic Review and Meta-Analysis

Berne Ting, Taiwan

Poster Blitz Award

Sponsored by Nutrarex Biotech

Presented by: Dr. Jane Pei-Chen Chang

Association between Kawasaki Disease in Childhood and Psychiatric Disorders: A Population-Based Cohort Study

Tzu-Li Chen, Taiwan

The Healing Power of Dancing Together - A Narrative Study of Dance Movement Therapy Group for People with Dementia

Yin-Hui Hong, Taiwan

The Anti-Obesity and Anti-Depressant Effects Evaluation of Korean Red Ginseng Extract in High-Fat Diet with an Unpredictable Chronic Mild Stress-Induced Obesity and Depression Mice Model

Hsin-Chen Tsai, Taiwan

Omega-3 Fatty Acids on White Matter Hyperintensity and Cognitive Impairment in Patients with Vascular Depression

Shih-Chun Meng, Taiwan

A Systematic Review of Adverse Childhood Experiences and Resilience on High-Risk Behavior, Emotional and Somatic Symptoms

Chia-Yu Chen, Taiwan

Young Researcher Award

Sponsored by Nutrarex Biotech

Presented by: Prof. Kuan-Pin Su

Prefrontal Cortical Activity Predicts Therapeutic Effects of Repetitive Transcranial Magnetic Stimulation in Major Depression: A Near-Infrared Spectroscopy

Po-Han Chou, M.D., MPH.

Cognitive Biases Predict Worry and Anxiety During Examinations and COVID-19 Pandemic - A UK Sample

Ya-Chun Feng, Ph.D.



Visual Poster Presentations

-
- ★ 5PB001 Association Between Kawasaki Disease in Childhood and Psychiatric Disorders: A Population-Based Cohort Study
Tzu-Li Chen, Taiwan
-
- ★ 5PB003 The Healing Power of Dancing Together- a Narrative Study of Dance Movement Therapy Group for People with Dementia
Yin-Hui Hong, Taiwan
-
- ★ 5PB004 The Anti-Obesity and Anti-Depressant Effects Evaluation of Korean Red Ginseng Extract in High-Fat Diet with an Unpredictable Chronic Mild Stress-Induced Obesity and Depression Mice Model
Hsin-Chen Tsai, Taiwan
-
- ★ 5PB006 Omega-3 Fatty Acids on White Matter Hyperintensity and Cognitive Impairment in Patients with Vascular Depression
Shih-Chun Meng, Taiwan
-
- ★ 5PB007 A Systematic Review of Adverse Childhood Experiences and Resilience on High-Risk Behavior, Emotional and Somatic Symptoms
Chia-Yu Chen, Taiwan
-
- PP001 Logistic Regression with Machine Learning Sheds Light on the Problematic Sexual Behavior Phenotype
Shui Jiang, Canada
-
- ★ PP002 Dysregulation of Leptin-Modulated Corticostriatal Circuitry and Altered Dietary Decision-Making Behavior in Bipolar Disorder
Shyh-Yuh Wei, Taiwan
-
- PP003 Genome-Wide DNA Methylation Analysis of Peripheral Blood for Psychological Resilience
Ke-Ming Lu, Taiwan
-
- PP010 Air Pollution Increase the Risk of Attention Deficit Hyperactivity Disorder (ADHD) in Taiwan: A Nationwide Cohort Study
Chia-Chun Yang, Taiwan
-
- PP012 First-Degree Family History of Diabetes is Associated with High Odds of Depression Independent of Life Risk Factors and Metabolic Status
Xiang Hu, China
-
- PP013 Biomarkers Common for Inflammatory Periodontal Disease and Depression: A Systematic Review
Sudan Neupane, Norway
-
- PP014 Psychoneuroimmunology of Suicide and Suicide Behavior
Sudan Neupane, Norway
-
- PP016 Development of the NutriMental Screener Enabling Identification of People with Mental Illness at Risk for Nutrition-Related Physical Health Conditions
Annabel S. Mueller-Stierlin, Germany
-
- PP018 An Analysis of Patterns in Art-Making Behaviors of Children with Autism Spectrum Disorder and Therapeutic Qualities of Art Mediums
Ping-Rong Chen, Taiwan
-
- PP019 The Antidepressant Effects of Korean Red Ginseng Water Extract in Unpredictable Chronic Mild Stress
Tzu-Wen Chou, Taiwan
-
- PP020 Effect of Fish Oil Formula Intervention on Headache and Blood Cholesterol in Migraine Patients
Chun-Pai Yang, Taiwan
-

PP021	Nutrition Counselling Program Involved “Diet, Mental and Behavior Modification” to Improve Weight Loss Plateau for Client with Schizophrenia Chia-Ching Lin , Taiwan
PP022	The Effectiveness of Individualized Neuropsychological Rehabilitation Program for a College Student with Diffuse Axonal Injury on Improving Adaptation of Returning to Campus: A Case Report Yu-Hsuan Huang , Taiwan
PP023	Effect of Home-Based Post-Acute Care on Improving Anxiety in Patients with Stroke Wen-Chih Lin , Taiwan
PP025	The Effect of Vitamin D Supplementation on PANSS in Schizophrenia: A Meta-Analysis of Randomized Controlled Trials Goh Xue Xin , Malaysia
PP026	Whether the COVID-19 Pandemic Affect Sexual Behavior: A Literature Review Pei-Yu Tseng , Taiwan
PP028	Association Between Fruit-Vegetable Intake and Risk of Non-Alcohol Fatty Liver Disease in Chinese Diabetic. Lin-Jia Du , China
PP029	Association Between Health Diet Status and Non-Alcoholic Fatty Liver Disease Among Patients with Type 2 Diabetes Mellitus. Xiao Gu , China
PP031	Use Music to See Mahler’s Life Li-Wei Ou , Taiwan
PP032	The Effects of Mindfulness Eating Lecture for Hospital Staff Yu-Kwan Tong , Hong Kong
PP033	Yoga Versus Massage in the Treatment of Aromatase Inhibitor-Associated Knee Joint Pain in Breast Cancer Survivors: A Randomized Controlled Trial Chia-Lin Tsai , Taiwan
★ PP034	Can Music Therapy Improve the Symptoms of the Anxiety in Dementia? A Systematic Review and Meta-Analysis Berne Ting , Taiwan
PP035	Exosomal let-7e, miR-21-5p, miR-145, miR-146a and miR-155 in Predicting Antidepressants Response Patients with Major Depressive Disorder Yi-Yung Hung , Taiwan
PP036	Electroacupuncture Regulates IL-17A Pathway for the Comorbidities of Chronic Pain and Depression in Mice Brain Yu-An Yeh , Taiwan
PP037	The Effect of Music Therapy for Children on Pain Release: A Systematic Review and Meta-Analysis Berne Ting , Taiwan
PP038	A Study on Use of Prolotherapy as Pharmacopuncture to Augment Fascia Proliferation and Repair Shu-Yih Wu , Taiwan
PP039	Validation of the Chinese Version of Relaxation Sensitivity Index Jie-Ting Zhang , China
PP040	Exploring the Relationship Between Post-Stroke Anxiety and Functional Performance of Stroke Patients Lin-Fu Lee , Taiwan

 5-min Poster Blitz Award  Best Poster Award

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Thank you for your participation in the 11th Mind-Body Interface International Symposium. In order to help us improve, we want to hear back from you. Please fill in the Feedback Survey by scanning the QR code below, and stay in touch with us on Facebook or Twitter for updates & photos.

第十一屆身心介面國際研討會的與會者，您好：

感謝您參與本次研討會，希望活動內容與安排能讓您有豐富的收穫。為使下一次活動更臻完美，請您依本次活動感受提供寶貴建議，作為日後舉辦活動之參考。邀請您協助掃描下方二維條碼填寫【會後意見調查表】，以作為我們往後改進的參考，更歡迎您關注我們的臉書與推特，明年見！



**The 12th Mind-Body Interface (MBI)
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Inflammation and Depression: Connecting the Dots

Guest Editors:

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Deadline for manuscript submissions:

1 May 2022

Message from the Guest Editors

Clinical depression and anxiety are not just national health issues. They are significant global health problems, with a worldwide prevalence of clinical depression amounting to nearly 4%. Moreover, their prevalence is certainly underreported, particularly since the beginning of the COVID-19 pandemic. This suggests that at least 26 million people are sad, fatigued, do not enjoy life, struggle with weight changes, and experience suicidal thoughts. This Special Issue in the *International Journal of Molecular Sciences* will provide cutting-edge, new information from laboratories around the world about inflammation and depression. This emerging field has been given a new moniker, labeled “immunopsychiatry”. Accepted publications will address new clinical discoveries as well as fundamental mechanisms derived from animal models. We seek high-quality submissions from the global scientific community to address this challenge.





Editor-in-Chief

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Message from the Editor-in-Chief

The International Journal of Molecular Sciences (*IJMS*, ISSN 1422-0067) is an open access journal, which was established in 2000. The journal aims to provide a forum for scholarly research on a range of topics, including biochemistry, molecular and cell biology, molecular biophysics, molecular medicine, and all aspects of molecular research in chemistry. *IJMS* publishes both original research and review articles, and regularly publishes special issues to highlight advances at the cutting edge of research. We invite you to read recent articles published in *IJMS* and consider publishing your next paper with us.

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糖尿病周邊神經病變所引起的
神經性疼痛、帶狀疱疹後神經痛、
成人局部癱瘓的輔助治療、
纖維肌痛(fibromyalgia)、
脊髓損傷所引起的神經性疼痛



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- 【成分含量與劑型】** 膠囊劑，每膠囊含有 75 毫克的pregabalin。 **【適應症】** 糖尿病周邊神經病變所引起的神經性疼痛、帶狀疱疹後神經痛、成人局部癱瘓的輔助治療、纖維肌痛(fibromyalgia)、脊髓損傷所引起的神經性疼痛。
- 【用法與用量】** 口服使用
- 「糖尿病周邊神經病變引起的神經性疼痛：對於肌酸酐清除率 60 mL/min 以上的病人，LYRICA 的最高建議劑量是 150 mg 每天兩次或 100 mg 每天三次(300 mg /天)。應從 75 mg 每天兩次或 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。」「帶狀疱疹後神經痛：對於肌酸酐清除率 60 mL/min 以上的病人，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。用 300 mg /天治療 2-4 週之後仍顯著疼痛，而且能耐受 LYRICA 的病人，可以用高達 300 mg 每天二次或 200 mg 每天三次(600 mg /天)的劑量治療。」「成人局部癱瘓的輔助治療：已證實 Lyrica 在 150-600 mg /天的劑量下是成人局部癱瘓發作的有效輔助治療。每日總劑量應該分二次至三次給藥。」「纖維肌痛：Lyrica 用於治療纖維肌痛時的建議劑量為 300 至 450 毫克/天。開始時應先授予 75 毫克每天兩次(150 毫克/天)的劑量。視療效與耐受性而定，可於 1 週內將劑量提高至 150 毫克每天兩次(300 毫克/天)。若病人在 300 毫克/天的劑量下未能獲得足夠的治療效益，可將劑量進一步提高至 225 毫克每天兩次(450 毫克/天)。」「脊髓損傷引起的神經性疼痛：Lyrica 用於治療脊髓損傷所引起之神經性疼痛時的建議劑量為 150 至 600 毫克/天。建議的起始劑量為 75 毫克每天兩次(150 毫克/天)。視療效與耐受性而定，可於 1 週內將劑量提高至 150 毫克每天兩次(300 毫克/天)。對以 150 毫克每天兩次之劑量治療 2 至 3 週後未能達到足夠之疼痛緩解效果，且仍可耐受 LYRICA 之作用的病人，可將治療劑量加至最高 300 毫克每天兩次。
- 【禁忌】** 已知對 pregabalin 或本品其他任何成分過敏的病人。曾有使用 pregabalin 的病人發生血管性水腫與過敏的現象。
- 【警語及注意事項】** 「血管性水腫：上市後曾有病人在 LYRICA 治療初期與長期治療期間發生血管性水腫的報告。」「過敏：有病人開始使用 LYRICA 治療後不久便發生過敏的上市後報告。」「自殺行為與自殺意圖：抗癲癇藥物 (AEDs)，包括 LYRICA，會升高使用此類藥物治療任何適應症之病人出現自殺念頭或自殺行為的風險。」「呼吸抑制：從病例報告、人體試驗和動物研究所得證據顯示，LYRICA 與中樞神經系統(CNS)抑制劑(包括鴉片類藥物)同時給藥，或有潛在呼吸障礙的背景情況下，會導致嚴重、危及生命或致死性的呼吸抑制。」「頭暈和嗜睡：LYRICA 可能會引起頭暈與嗜睡。」「突然或快速停藥導致不良反應風險增加：與所有抗癲癇藥(AED)相同，逐漸停用 LYRICA 以降低癲癇病人癲癇發作頻率增加的可能性。」「周邊水腫：LYRICA 治療可能會引起周邊水腫。」「體重增加：LYRICA 治療會使體重增加。」「致腫瘤可能性：在 LYRICA 標準臨床前活體內終身致癌性研究中，在兩個不同品種的小鼠發現到血管肉瘤的發生率增高。」「對眼睛的影響：在對照性試驗中，接受 LYRICA 治療的病人通報視力模糊的比例 (7%) 比接受安慰劑治療者 (2%) 高，這些症狀在大部分病例會隨著繼續給藥而消失。」「肌酸激酶升高：LYRICA 治療會伴隨肌酸激酶 (creatinine kinase) 升高。」「血小板計數減少：LYRICA 治療會伴隨血小板計數減少。」「PR 間期延長：LYRICA 治療會伴隨 PR 間期延長。
- 【不良反應】** 在結合所有病人群的上市前對照性試驗中(包括 DPN、PHN 以及合併局部癱瘓的成人病人)，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(大於或等於 5% 而且是在安慰劑組出現比率的 2 倍)。
- 【常見不良反應】** 全身-常見：眩暈、過敏反應、發燒、消化不良-常見：胃腸炎、食慾增加、血液與淋巴系統-常見：疲勞、肌肉骨骼系統-常見：關節痛、腿部痠痛、肌痛、肌無力、神經系統-常見：焦慮、人格解體、肌張力過強、知覺減退、性慾減退、眼球震顫、感覺異常、鎮靜、昏迷、抽搐、皮膚與附屬構造-常見：瘙癢、特殊感官-常見：結膜炎、視視、中耳炎、耳鳴、生殖泌尿系統-常見：性冷感、陽痿、頻尿、尿失禁

備註：*此為處方資訊摘要，完整處方資訊請詳閱仿單。 Reference : 1. Roth T, van Seventer R, Murphy TK. Curr Med Res Opin. 2010;26(10):2411-2419.

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ICD10: F20

健保代碼

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