



INTERNATIONAL BRAIN  
**IBRO**  
RESEARCH ORGANIZATION



BRAIN SCIENCE INSTITUTE  
MNUMS



MONGOLIAN NEUROSCIENCE SOCIETY

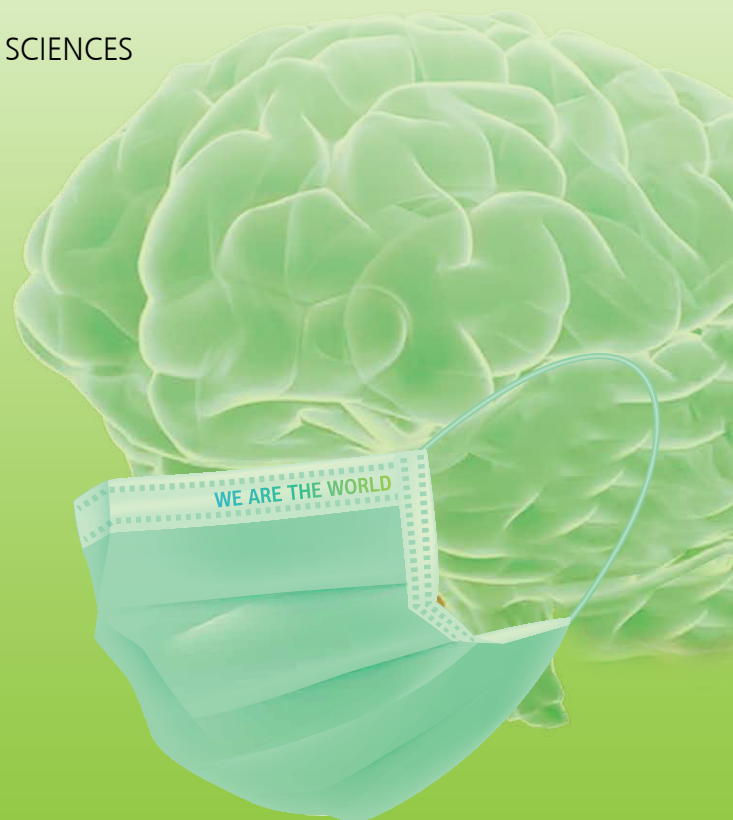


# MULTIDISCIPLINARY BRAIN SCIENCE-2020

INTERNATIONAL ACADEMIC CONFERENCE (VIRTUAL)

BRAIN SCIENCE INSTITUTE,  
MONGOLIAN NATIONAL UNIVERSITY OF MEDICAL SCIENCES

THE 7<sup>th</sup> ANNUAL MEETING OF  
MONGOLIAN NEUROSCIENCE SOCIETY



AUGUST 14-15, 2020  
ULAANBAATAR, MONGOLIA

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# MULTIDISCIPLINARY BRAIN SCIENCE 2020

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THE 7<sup>th</sup> ANNUAL MEETING OF  
MONGOLIAN NEUROSCIENCE SOCIETY

**AUGUST 14-15, 2020  
ULAANBAATAR, MONGOLIA**

## ORGANIZING COMMITTEE

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Enkhjin B. M.D.

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Udval S. M.D., Ph.D., Board Member

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### **National Center for Mental Health of Mongolia**

### **Department of Neurology, MNUMS**

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Damdindorj B. M.D., Ph.D., Dean

Battsetseg B.

Ankhubayar A.

### **Department of Science and Technology, MNUMS**

Otgonbayar D. M.D., Ph.D., Dean

Galindev B. Ph.D.

Javkhlan B. M.D., MSc.

Otgon Z. MA

Indra G. M.D., MSc.

Enkhnaran T. M.D., MSc.

### **Volunteers:**

Anu Ch

Enerel B

Sandagsuren S

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Anu M

Khaliunaa U

Sharavdorj Kh

Uyanga A

Jargalsaikhan G

Altaa B

Khongorzul Ch

Khash-Erdene D

Khorolsuren L

Ulziikhuu T

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### **Editors:**

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### **Printed by:**

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**“MULTIDISCIPLINARY BRAIN SCIENCE 2020”**  
**BRAIN SCIENCE INSTITUTE, MNUMS, August 14-15, 2020**

<b>DAY 1</b>	<b>August 14 (Friday), 2020</b>
<b>TIME</b>	<b>MONGOLIAN NATIONAL UNIVERSITY OF MEDICAL SCIENCES (08:30-17:10)</b>
<b>08:30</b>	<b>REGISTRATION (08:30-09:00)</b>
<b>09:00</b>	<b>OPENING CEREMONY (09:00-09:30)</b>
	Tsolmon J., President, Mongolian National University of Medical Sciences (MNUMS)
	Damdindorj B., Dean, Graduate School, MNUMS
	Oyunsuren E., Secretary, Science and Technology Board, Ministry of Health, Mongolia
	Battuvshin L., Director, Brain Science Institute, MNUMS
<b>09:30</b>	<b>KEYNOTE LECTURES I (09:30-10:20)</b>
	<i>Chairs: Tsolmon J., Chimedsuren O.</i>
09:30	Bong-Kiun Kaang, Department of Biological Sciences, Seoul National University, Korea
	<i>Title: Memory and Synapse</i>
<b>10:20</b>	<b>PLENARY LECTURES (10:20-11:20)</b>
	<i>Chairs: Sumberzul N., Tserendagva D.</i>
10:20	Tetsuya Hiramoto, Department of Psychosomatic Medicine, National Hospital Organization, Kyushu University, Japan
	<i>Title: What are TRP channels ? How do we feel heat and pain ?</i>
10:50	Vadim A. Byvaltsev, Department of Neurosurgery, Irkutsk State Medical University, Russia
	<i>Title: Safety and efficacy of laminoplasty versus laminectomy in the treatment of spinal cord tumors: Preliminary results of a randomized controlled trial</i>
11:20	Coffee break (11:20-11:30)
<b>11:30</b>	<b>IBRO LECTURES I (11:30-13:00)</b>
	<i>Chairs: Bayasgalan T., Enkhsaikhan L.</i>
11:30	Kai Wang, Optical Engineering Laboratory, Institute of Neuroscience, The Chinese Academy of Sciences, People’s Republic of China
	<i>Title: Development of optical imaging methods to go deeper, finer and faster in living brain</i>
12:00	Hyoung-Gon Ko, Department of Biological Sciences, College of Natural Sciences , Seoul National University, Korea
	<i>Title: Neuronal populations processing itch and pain stimuli in the anterior cingulate cortex</i>
12:30	Jaya Kumar, Department of Physiology, National University of Malaysia, Malaysia
	<i>Title: Interaction between mTORC2 and PKC epsilon in alcohol use disorder</i>
13:00	Lunch (13:00-14:00)

<b>14:00</b>	<b>KEYNOTE LECTURES II (14:00-14:50)</b>
	<i>Chairs: Battuvshin L, Damdindorj B.</i>
14:00	Norman Sartorius, AIMHP, Switzerland <i>Title: Tasks for Psychiatrists in the early 21<sup>st</sup> Century</i>
<b>14:50</b>	<b>IBRO LECTURES II (14:50-15:30)</b>
	<i>Chairs: Enkh-Saikhan L., Oyuntugs B.</i>
14:50	Ranjana Bhandari, University Institute of Pharmaceutical Sciences, Punjab University, India <i>Title: Neuropsychopharmacotherapeutic interventions for targeting gut-brain dysbiosis in autism spectrum disorders</i>
15:10	Nicholas Pang, Department of Psychiatry, Universiti Malaysia Sabah, Malaysia <i>Title: Circus-based mindfulness as gamification of psychological intervention for Lower and Middle Income Countries</i>
<b>15:30</b>	<b>NEUROSCIENCE (15:30-16:10)</b>
	<i>Chairs: Darambazar G., Mandakhnaran D.</i>
15:30	Tsolmon J., President, MNUMS <i>Title: Brain Science – The frontier science of XXI century</i>
15:40	Enkhnanan T., Department of Science and Technology, MNUMS <i>Title: Validation and Psychometric Properties of the Mongolian Version of the Touch Experiences and Attitudes Questionnaire</i>
15:50	Choinyam B, Lecturer, Department of Physiology, MNUMS <i>Title: Effect of day time nap on visual discrimination tasks</i>
16:00	Coffee break (16:00-16:10)
<b>16:10</b>	<b>NEUROLOGY &amp; NEUROIMAGING (16:10-16:50)</b>
	<i>Chairs: Byambasuren D., Munkhbaatar D.</i>
16:10	Puntsagdulam B., Department of Neurology, MNUMS <i>Title: Colour Doppler Ultrasonographic Characteristics of Carotid Artery Among Mongolians: In a Population-Based Screening Study</i>
16:20	Gantuya G., Department of Neurology, MNUMS <i>Title: Isolated absence of F-Waves in patients with Gullian-Barre syndrome</i>
16:30	Nadmid Kh., “Monfa Trade” LLC <i>Title: Role of methylcobalamin in stroke and poliomyelitis</i>
<b>16:50</b>	<b>PSYCHIATRY &amp; SOCIAL PSYCHOLOGY (16:50-17:20)</b>
	<i>Chairs: Gantsetseg T., Bayarmaa Ts.</i>
16:50	Bayarmaa Ts., Mongolian State University of Education <i>Title: The influence of watching tv on children minds and behavior</i>
17:00	Tuya B., Bayanzurkh district family, children and youth center <i>Title: Frame of reference for teenage life and values</i>
17:10	Enkh-Uchral E., Enkh-Uchral Clinic, <i>Title: The result of investigating the motive for tobacco smoking among working adults in Mongolia</i>
<b>17:20</b>	<b>END OF DAY 1</b>

<b>DAY 2</b>	<b>August 15 (Saturday), 2020</b>
<b>TIME</b>	<b>MONGOLIAN NATIONAL UNIVERSITY OF MEDICAL SCIENCES (08:30-16:20)</b>
<b>08:30</b>	<b>REGISTRATION (08:30-09:00)</b>
<b>09:00</b>	<b>INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE I (09:00-10:40)</b>
	<i>Chairs: Damdindorj B., Battuvshin L.</i>
09:00	Sundeeep Robert Datta, Department of Neurobiology, Harvard University, USA <i>Title: Emerging mechanisms linking COVID-19 to anosmia</i>
09:20	Matthew Dalva, Department of Neuroscience, Thomas Jefferson University, USA <i>Title: Seeing into the organization of the synapse</i>
09:40	Shernaz Bamji, Department of Cellular and Physiological Sciences, University of British Columbia, Canada <i>Title: Post-translational palmitoylation in the regulation of synaptic plasticity</i>
10:00	Tomomi Shimogori, Center for Brain Science, RIKEN, Japan <i>Title: Cellular-resolution gene expression profiling in the neonate marmoset brain</i>
10:20	Coffee break (10:20-10:30)
<b>10:30</b>	<b>PUBLIC LECTURES ON BRAIN SCIENCE I (10:30-13:30)</b>
	<i>Chairs: Gantsetseg T., Damdindorj B.</i>
10:30	Damdindorj B., Graduate School, MNUMS <i>Title: Stress and Obesity</i>
10:50	Nansalma N., Department of Humanity, National University of Mongolia <i>Title: Language skills and the Brain</i>
11:10	Baasandash Ch., Mongolian University of Science and Technology <i>Title: Brain study initiatives at the Mongolian University of Science and Technology</i>
11:30	Darambazar G., University High School, MNUMS <i>Title: Brain Health and Learning: Recruiting the Power of Brain</i>
11:50	Choijamts G., Vice President, Otoch Manramba University <i>Title: Clinical use and therapeutic value of cannabinoids</i>
12:10	Bilegsaikhan B., Machine Learning Team, AND Systems Tech <i>Title: Use cases and accessibility of Artificial Intelligence in Mongolia</i>
12:30	Luncheon seminar (12:30-14:00) Nadmid Kh., "Monfa Trade" LLC <i>Title: Correlation of depression and coronary heart disease</i>

**14:00 INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE II  
(14:00-15:20)**

*Chairs: Bayasgalan T., Tumenjin E.*

14:00 Yimin Zou, Department of Neurobiology, University of California San Diego, USA  
*Title: Planar Cell Polarity Signaling Pathway in Glutamatergic Synapse Formation and Maintenance*

14:20 John Ngai, National Institute of Neurological Disorders and Stroke, National Institutes of Health, USA  
*Title: Deconstructing neural stem cell trajectories at single cell resolution*

14:40 Anna Beyeler, Beyeler Lab, INSERM Bordeaux, France  
*Title: Role of divergent projection neurons of the insular cortex in anxiety and valence-related behaviors*

15:00 Jens Hjerling Leffler, Department of Biochemistry and Biophysics, Karolinska Institutet, Sweden  
*Title: Single cell analysis in the brain and why it matters for disease*

15:20 Coffee break (15:20-15:30)

**15:30 PUBLIC LECTURES ON BRAIN SCIENCE II (15:30-16:10)**

*Chairs: Tserenbat M., Baasanjargal B.*

15:30 Jargal B., Department of Research and Public Health, National Center for Mental Health  
*Title: Stress and Mental Disorders*

15:50 Gantsetseg T., Department of Mental Health, MNUMS  
*Title: Sleep and fatigue*

**16:10 CLOSING REMARKS (16:10-16:20)**



## VENUE MAP

**August 14-15, 2020**  
**Graduate School, Mongolian National University of Medical Sciences**



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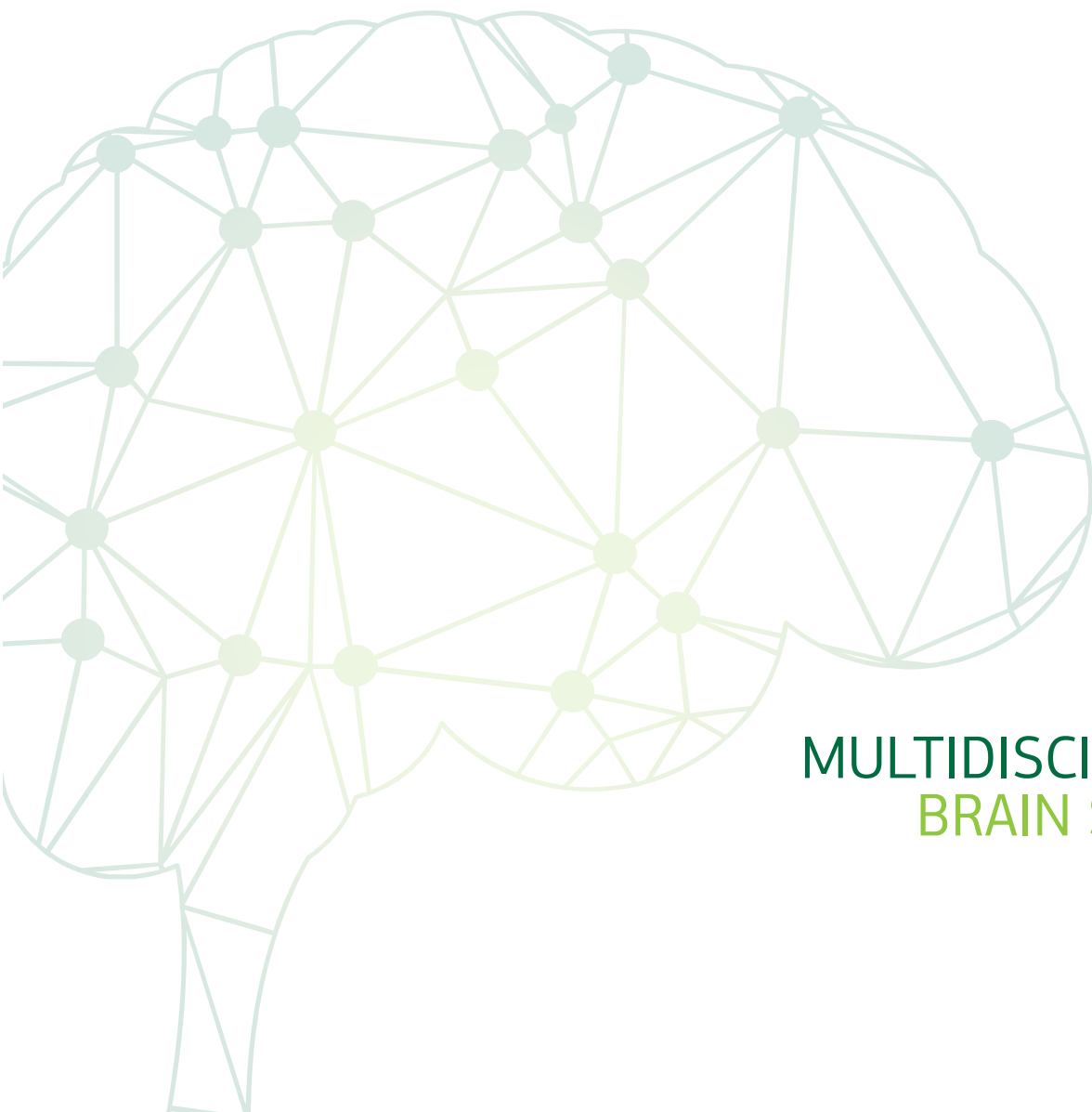
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WELCOME MESSAGES

# WELCOME MESSAGES

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MULTIDISCIPLINARY  
BRAIN SCIENCE

2020



## GREETINGS FROM THE PRESIDENT OF THE MONGOLIAN NATIONAL UNIVERSITY OF MEDICAL SCIENCES

Dear distinguished guests and colleagues....

First and foremost I would like to congratulate the Brain Science Institute for successfully organizing the Multidisciplinary Brain Science 2020 international academic conference. Since 2015, I have been endorsing our young neuroscientists who seek to develop this frontier science in Mongolia. We are more grateful that our goal to expand neuroscience in our country had become this far. Among many branches of science, the “Brain Science” or Neuroscience has thrived at the intersection of biology, mathematics and philosophy; it already become the frontier science of 21 “century. Neuroscience Research is witnessing exciting moments in light of recent advances and convergence of molecular, structural, functional and computational approaches. This conference will not only enhance the knowledge and skills of the participants on emerging developments in the field of neuroscience but will also serve as a platform to exchange ideas, discover research opportunities and foster new collaborations.

This international conference is extraordinary, as we are all aware of COVID - 19 pandemic that spreading worldwide, governments, scientific research centers, universities, etc. Which is making a U-turn, as do we searching and developing new methods and contributions to maintain the cooperation and relations. This year’s conference will bring many scientists from around the world to share their experiences. For example, Dr. John Ngai, director of the NIH’s Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative of U.S, Dr. Sandeep Robert Datta who is Associate Professor of Neurobiology in Harvard medical school in U.S. Dr. Jens Hjerling Leffler, Assistant Professor and Principle Investigator of Karolinska Institute in Sweden. Dr. Tomomi Shimogori, Dr. Riken Center for Brain Science in Japan, Dr. Anna Beyeler, chief of Neurocentre Magendie in France, Professor Yimin Zou, California University, Dr. Shernaz Bamji, hed of neuroscience research group of Tula Foundation Investigator (Brain Research Centre) in Canada. Kai Wang, Institute of Neuroscience Chinese Academy of Sciences, Dr. Kaang, Bong-Kiun, Professor of Brain Cognitive Sciences, Seoul National University in Korea.

The Brain Science Society is collaborating with IBRO hosting this conference online for the first time. It provides an opportunity for graduate students, young scientists and everyone who wants to participate from anywhere in the world, I would like to quote Alexander Graham Bell once said: One door closes another one opens. I sincerely hope our academic conference will open a door for new possibilities, new ideas and a spark of fire for those who wish and seek to explore and develop this field of science.

Thank you for your kind attention.  
TSOLMON Jadamba D.D.S., Ph.D  
President of Mongolian National University of Medical Sciences.

**GREETINGS FROM PRESIDENT OF  
GRADUATE SCHOOL OF MONGOLIAN NATIONAL  
UNIVERSITY OF MEDICAL SCIENCES**



Dear Distinguished Professor, Colleagues and Guests

I'm pleased to welcome you to this International academic conference, the 7<sup>th</sup> annual meeting of Brain Science Institute in Graduate school of MNUMS. I am sure that this meeting will provide to secure a research-friendly with skilled well researchers to share their diamond scientific experiments with all participants joined in this meeting. As we know, we are faced in stages of brain science.

Particularly, the neuroscience is tremendously developing to be essential field of life sciences in the world. Neuroscience has made extremely progressed and integrated research activities with multidiscipline, including neurophysiology, neuroimmunology, biochemistry, molecular cell biology, computational science, nanotechnology and social physiology, as well as clinical brain sciences including neurology, psychiatry and neurosurgery.

We really hope that this conference will be the an important stage to get a result in a long lasting cooperation and fruitful relationship for the participants. I believe that we have plenty of new ideas for our scientists and build our gorgeous mankind relationship.

Thank you very much.

DAMDINDORJ Boldbaatar, MD., Ph.D

Dean, Graduate School, Mongolian National University of Medical Sciences.



## GREETINGS FROM THE DIRECTOR OF BRAIN SCIENCE INSTITUTE

Dear Distinguished Guests and Dear Friends,

On behalf of the Brain Science Institute, it is my great honor and pleasure to welcome you to this 7<sup>th</sup> international academic conference that is held virtually in Ulaanbaatar Mongolia.

I must thank to everyone who made possible to organize this conference, namely the members of the Brain Science Institute, Graduate School of MNUMS, and the Mongolian Neuroscience Society. It was also supported by the International Brain Research Organization (IBRO). Especially, I would like to express my most sincere gratitude to the great support of our distinguished invited speakers from abroad who kindly considered to share their expertise in neuroscience with us, for taking their valuable time for our audience.

There is no doubt that neuroscience, the frontier science of the 21<sup>st</sup> century, is rapidly becoming recognized and admired. The mission of the Brain Science Institute is to develop brain science by translating up-to-date knowledge and fundamental technologies of neuroscience to the country by establishing a research platform for multidisciplinary studies to strengthen the health, productivity, and creativity of the population.

I'm truly honored by my mentors, Professors Sartorius and Hiramoto, and my colleagues, Dr Shimogori and others, for their great support to this virtual event amid the COVID-19 pandemic.

We really hope that this conference will offer the most fruitful collaboration with the participants.

Let us develop Brain Science in Mongolia!

BATTUVSHIN Lkhagvasuren, MD., Ph.D  
Director, Brain Science Institute, Mongolian National University of Medical Sciences  
President, Mongolian Neuroscience Society

KEYNOTE SPEAKERS  
**KEYNOTE SPEAKERS**



**MULTIDISCIPLINARY  
BRAIN SCIENCE  
2020**

## KEY NOTE LECTURES

### BONG-KIUN KAANG



Professor, Department of Neurobiology, School of Biological Sciences, Seoul National University, South Korea

### EDUCATION PROFILE

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- 1992 Ph.D., Columbia University (Supervisor: Nobel Laureate Eric R. Kandel)
- 1984 B.S., Seoul National University
- 1986 Ph.D., Seoul National University, Graduate Program in Medical School, Major in Biochemistry
- 1983 M.M.S., Seoul National University, Graduate Program in Medical School, Major in Biochemistry

### HONORS AND AWARDS

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- 2018 Korea Best Scientist & Engineer Award (Korean Federation of Science and Technology and the Korean Government)
- 2016 National Academy of Sciences Award of Korea
- 2012 Donghun Award (Korean Society for Biochemistry and Molecular Biology)
- 2012 Kyung Ahm Prize (Kyung Ahm Foundation)
- 2008 Life Science Award (Korean Society for Molecular and Cellular Biology)

## PUBLICATIONS

**He has published more than 210 research and review articles in a number of journals, including Science, Cell, Nature, Neuron, and Nature Neuroscience. He is currently the Editor-in-Chief of Molecular Brain.**

- Choi JH, Sim SE, Kim JI, Choi DI, Oh J, Ye S, Lee J, Kim TH, Ko HG, Lim CS, Kaang BK\*. Interregional synaptic maps among engram cells underlie memory formation. *Science*. 2018. 360: 430
- Bliss TV\*, Collingridge GL\*, Kaang BK\*, Zhuo M\*. Anterior cingulate cortex plasticity in chronic pain and emotion. *Nat Rev Neurosci*. 2016. 17:485
- Cho J, Yu NK, Choi JH, Sim SE, Kang SJ, Kwak C, Lee SW, Kim JI, Choi DI, Kim VN\* Kaang BK\*. Multiple repressive mechanisms in the hippocampus during memory formation. *Science*. 2015. 350: 82
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- Li XY, Ko HG, Chen T, Descalzi G, Koga K, Wang H, Kim SS, Shang Y, Kwak C, Park SW, Shim J, Lee K, Collingridge GL, Kaang BK\*, Zhuo M.\* Alleviating neuropathic pain hypersensitivity by inhibiting PKM $\zeta$  in the anterior cingulate cortex. *Science*. 2010. 330:1400
- Lee YS, Choi SL, Lee SH, Kim H, Park H, Lee N, Lee SH, Chae YS, Jang DJ, Kandel ER, Kaang BK\*. Identification of a serotonin receptor coupled to adenylyl cyclase involved in learning related heterosynaptic facilitation in Aplysia. *Proc Natl Acad Sci USA*. 2009. 106:14634
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- Lee SH, Lim CS, Park H, Lee JA, Han JH, Kim H, Cheang YH, Lee SH, Lee YS, Ko HG, Jang DH, Kim H, Miniaci MC, Bartsch D, Kim E, Bailey CH, Kandel ER, Kaang BK\*. Nuclear translocation of CAM-associated protein activates transcription for long-term facilitation in Aplysia. *Cell*. 2007. 129:801
- Kim H, Lee SH, Han JH, Lee JA, Cheang YH, Chang DJ, Lee YS, Kaang BK\*. A Nucleolar Protein ApLLP induces ApC/EBP expression required for long-term synaptic facilitation in Aplysia neurons. *Neuron*. 2006. 49:707 (\* Corresponding author)



## KEY NOTE LECTURES

### NORMAN SARTORIUS



M.D., M.A., D.P.M., Ph.D., FRC. Psych.

### EDUCATION PROFILE

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- 1993 Professor, University of Geneva, Geneva, Switzerland
- 1963 Ph.D., (psychiatry and neurology) University of Zagreb, Zagreb, Croatia
- 1962 B.Sc., M.A., (psychology) Faculty of Humanities and Social Sciences, University of Zagreb, Zagreb, Croatia
- 1958 M.D., School of Medicine, University of Zagreb, Zagreb, Croatia

### HONORS AND AWARDS

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- 1980 Rema Lapouse Award
- 2002 Harvard Award in Psychiatric Epidemiology and Statistics
- 2003 Burgholzli award for Clinical and Social Psychiatry
- 2005 Prince Mahidol Award in Medicine
- 2012 Eli Lilly Welcome Back Award
- 2014 Lifetime Achievement Award from the Royal College of Psychiatrists
- 2016 Wilhelm-Griesinger Prize from the German Association for Psychiatry, Psychotherapy and Psychosomatics
- 2017 Lifetime Achievement Award, Asian Federation of Psychiatric Associations

## PUBLICATIONS

- Antipsychotic Polypharmacy In Older Adult Asian Patients With Schizophrenia: Research On Asian Psychotropic Prescription Pattern. Opens in a new tab., Dong, Min; Zeng, Liang-Nan; Zhang, Qinge; Yang, Shu-Yu; Chen, Lian-Yu; Sim, Kang; He, Yan-Ling; Chiu, Helen Fung-Kum; Sartorius, Norman; Tan, Chay-Hoon; Chong, Mian-Yoon; Shinfuku, Naotaka; Lin, Shih-Ku; Ng, Chee H; Ungvari, Gabor S... *Journal Of Geriatric Psychiatry & Neurology*. 2019 Nov; 32(6):304-311
- Prescription Of Antipsychotic And Concomitant Medications For Adult Asian Schizophrenia Patients: Findings Of The 2016 Research On Asian Psychotropic Prescription Patterns (REAP) Survey. Opens in a new tab., Dong, Min; Zeng, Liang-Nan; Zhang, Qinge; Yang, Shu-Yu; Chen, Lian-Yu; Najoan, Eunice; Kallivayalil, Roy Abraham; Viboonma, Kittisak; Jamaluddin, Ruzita; Javed, Afzal; Hoa, Duong Thi Quynh; Iida, Hitoshi; Sim, Kang; Swe, Thiha; He, Yan-Ling...., *Asian Journal Of Psychiatry*. 2019 Aug 26; 45:74-80
- Cannabis Use Correlates With Aggressive Behavior And Long-Acting Injectable Antipsychotic Treatment In Asian Patients With Schizophrenia. Opens in a new tab., Park, Seon-Cheol; Oh, Hong Seok; Tripathi, Adarsh; Kallivayalil, Roy Abraham; Avasthi, Ajit; Grover, Sandeep; Tanra, Andi Jayalangkara; Kanba, Shigenobu; Kato, Takahiro A; Inada, Toshiya; Chee, Kok Yoon; Chong, Mian-Yoon; Lin, Shih-Ku... *Nordic Journal Of Psychiatry*. 2019 Aug; 73(6):323-330
- Concurrent Antipsychotic Use In Older Adults Treated With Antidepressants In Asia. Opens in a new tab., Dong, Min; Zeng, Liang-Nan; Zhang, Qinge; Ungvari, Gabor S; Ng, Chee H; Chiu, Helen F K; Si, Tian-Mei; Sim, Kang; Avasthi, Ajit; Grover, Sandeep; Chong, Mian-Yoon; Chee, Kok-Yoon; Kanba, Shigenobu; Lee, Min-Soo; Yang, Shu-Yu; Udomratn, Pichet... *Psychogeriatrics : The Official Journal Of The Japanese Psychogeriatric Society*. 2019 Jul; 19(4):333-339
- What Is New Within Staging Of Care For People With Dementia? The IDEAL Schedule And Other Recent Work. Opens in a new tab., Semrau, Maya; Sartorius, Norman., *Current Opinion In Psychiatry*. 2019 Jul; 32(4):366-371
- Key Lessons Learned From The INDIGO Global Network On Mental Health Related Stigma And Discrimination. Opens in a new tab., Thornicroft, Graham; Bakolis, Ioannis; Evans-Lacko, Sara; Gronholm, Petra C; Henderson, Claire; Kohrt, Brandon A; Koschorke, Mirja; Milenova, Maria; Semrau, Maya; Votruba, Nicole; Sartorius, Norman., *World Psychiatry : Official Journal Of The World Psychiatric Association (WPA)*. 2019 Jun; 18(2):229-230
- Clozapine Prescription Pattern In Patients With Schizophrenia In Asia: The REAP Survey (2016). Opens in a new tab., Xu, Shi-Wei; Dong, Min; Zhang, Qinge; Yang, Shu-Yu; Chen, Lian-Yu; Sim, Kang; He, Yan-Ling; Chiu, Helen Fk; Sartorius, Norman; Tan, Chay-Hoon; Chong, Mian-Yoon; Shinfuku, Naotaka; Lin, Shih-Ku; Ng, Chee H; Ungvari, Gabor S; Najoan, Eunice... *Psychiatry Research*. 2019 Mar 16; 112271
- Child And Adolescent Psychiatry In The Far East: A 5-Year Follow Up On The Consortium On Academic Child And Adolescent Psychiatry In The Far East (CACAP-FE) Study. Opens in a new tab., Hirota, Tomoya; Guerrero, Anthony; Sartorius, Norman; Fung, Daniel; Leventhal, Bennett; Ong, Say H; Kaneko, Hitoshi; Apinuntavech, Suporn; Bennett, Abang; Bhoomikumar, Jegannathan; Cheon, Keun-Ah; Davaasuren, Oyunsuren... *Psychiatry & Clinical Neurosciences*. 2019 Feb; 73(2):84-89



PLENARY & IBRO

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**SPEAKERS**

SPEAKERS



MULTIDISCIPLINARY  
BRAIN SCIENCE

**2020**

## PLENARY LECTURES

### TETSUYA HIRAMOTO



Head, Department of Psychosomatic Medicine, National Hospital Organization, Fukuoka Hospital, Fukuoka, Japan  
Advisor, International Advisory Board, Brain Science Institute, MNUMS

### EDUCATION PROFILE

---

- 2009 PhD, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan
- 1996 MA, Medical Sciences Hiroshima University, Hiroshima, Japan
- 1994 BA, Medical Sciences Hiroshima University, Hiroshima, Japan

### HONORS AND AWARDS

---

- 2010 Best Presentation Award at the 26<sup>th</sup> Congress of Japanese Association of Stress Science

## PUBLICATIONS

---

- Hiramoto T, Yoshihara K, Asano Y, Sudo N. (2017) Protective Role of the Hepatic Vagus Nerve against Liver Metastasis in Mice. *Neuroimmunomodulation*. 24:341-7.
- Sawamoto R, Nagano J, Kajiwara E, Sonoda J, Hiramoto T, Sudo N. (2016) Inhibition of emotional needs and emotional wellbeing predict disease progression of chronic hepatitis C patients: an 8-year prospective study. *Biopsychosoc Med*. 10:24.
- Yoshihara K, Hiramoto T, Oka T, Kubo C, Sudo N. (2014) Effect of 12 weeks of yoga training on the somatization, psychological symptoms, and stress-related biomarkers of healthy women. *Biopsychosoc Med*. 8:1.
- Nishino R, Mikami K, Takahashi H, Tomonaga S, Furuse M, Hiramoto T, Aiba Y, Koga Y, Sudo N. (2013) Commensal microbiota modulate murine behaviors in a strictly contamination-free environment confirmed by culture-based methods. *NeurogastroenterolMotil*.25:521-8.
- Zhao P, Hiramoto T, Asano Y, Kubo C, Sudo N. (2012) Chronic psychological stress exaggerates the compound 48/80-induced scratching behavior of mice. *Pharmacology, Biochemistry and Behavior*. 105:173–6
- Asano Y, Hiramoto T, Nishino R, Aiba Y, Kimura T, Yoshihara K, Koga Y, Sudo N. (2012) Role of gut microbiota in the production of biologically active, free catecholamines in the gut lumen of mice. *American Journal of Physiology Gastrointestinal and Liver Physiology*. 303:G1288-95.
- Yoshihara K, Hiramoto T, Sudo N, Kubo C. (2011) Profile of mood states and stress-related biochemical indices in long-term yoga practitioners. *Biopsychosocial medicine*5:6.

## PLENARY LECTURES

### BIVALTSEV VADIM ANATOLIEVICH



Vice-Director for innovation and international activities,  
Irkutsk, Scientific Center for Surgery and Traumatology  
Head and Professor, Irkutsk State Medical University;  
Neurosurgery and Innovative Medicine Department,  
Irkutsk

### EDUCATION PROFILE

- 1999 Ph.D. (Psychology) University of Illinois at Urbana-Champaign
- 1989 M.A. (Sociology) University of Missouri at Columbia
- 1986 B.B.A. (Business Administration) Korea University

### PUBLICATIONS

- Effects of non-verbal priming on attachment-style activation Sim, S., Shin, J. E. & Sohn, Y. W., 2019 Jan 1, In : *Frontiers in Psychology*. 10, APR, 684.
- Having a calling on board: Effects of calling on job satisfaction and job performance among South Korean newcomers Park, J., Kim, S., Lim, M. & Sohn, Y. W., 2019 Jan 1, In : *Frontiers in Psychology*. 10, JULY, 1584.
- Perceived Overqualification, Boredom, and Extra-Role Behaviors: Testing a Moderated Mediation Model Kim, J. J., Park, J., Sohn, Y. W. & Lim, J. I., 2019 Jan 1, In : *Journal of Career Development*.
- Work context and turnover intention in social enterprises: the mediating role of meaning of work Sun, J., Lee, J. W. & Sohn, Y. W., 2019 Feb 11, In : *Journal of Managerial Psychology*. 34, 1, p. 46-60 15 p.

- Calling as a Predictor of Life Satisfaction: The Roles of Psychological Capital, Work–Family Enrichment, and Boundary Management Strategy Choi, Y. E., Cho, E., Jung, H. J. & Sohn, Y. W., 2018 Nov 1, In : *Journal of Career Assessment*. 26, 4, p. 567-582 16 p.
- Emotion regulation and job stress: The mediating effect of relationship quality in the US and Korean samples Jung, Y., Sohn, Y. W. & Kim, M. Y., 2018 Jan 1, (Accepted/In press) In : *Current Psychology*.
- Leading with callings: Effects of leader’s calling on followers’ team commitment, voice behavior, and job performance Park, J., Lee, K., Lim, J. I. & Sohn, Y. W., 2018 Sep 12, In : *Frontiers in Psychology*. 9, SEP, 1706.
- The Effects of Anxiety on Attention Problems and Rule-Breaking Behavior: The Moderating Effect of Work Adjustment in the Workplace Lee, S. M., Kim, Y. A., Park, I. J. & Sohn, Y. W., 2018 Sep 1, In : *Current Psychology*. 37, 3, p. 602-611 10 p.
- A moderated mediation model of job stress, job satisfaction, and turnover intention for airport security screeners Chung, E. K., Jung, Y. & Sohn, Y. W., 2017 Oct 1, In : *Safety Science*. 98, p. 89-97 9 p.
- Effects of grit on academic achievement and career-related attitudes of college students in Korea Lee, S. & Sohn, Y. W., 2017 Jan 1, In : *Social Behavior and Personality*. 45, 10, p. 1629-1642 14 p.



## IBRO LECTURES

### KAI WANG



Head, Optical Engineering Laboratory, Institute of Neuroscience, The Chinese Academy of Sciences, China

### EDUCATION PROFILE

- 2011 MA, Ph.D., Electrical Engineering, Cambridge, Harvard University
- 2007 M.Eng., Electrical Engineering, Tsinghua University, Beijing
- 2005 B.Sc., Electrical Engineering, Tsinghua University, Beijing

### PUBLICATIONS

#### Peer-Reviewed Journal Publications

- Liu, T.#, Upadhyayula, S.#, Milkie, D.E., Singh, V., Wang, K., Swinburne, I.A., Mosaliganti, K.R., Collins, Z.M., Hiscock, T.W., Shea, J., Kohrman, A.Q., Medwig, T.N., Dambournet, D., Forster, R., Cunniff, B., Ruan, Y., Yashiro, H., Scholpp, S., Meyerowitz, E.M., Hockemeyer, D., Drubin, D.G., Martin, B.L., Matus, D.Q., Koyama, M., Megason, S.G., Kirchhausen, T., Betzig, E.\*. Observing the cell in its native state: Imaging subcellular dynamics in multicellular organisms. *Science* 360, 284 (2018).
- Cong, L.#, Wang, Z.#, Chai, Y.#, Hang, W.#, Shang C., Yang W., Bai, L., Du, J., Wang, K.\* & Wen, Q.\*. Rapid whole brain imaging of neural activity in freely behaving larval zebrafish (*Danio rerio*). *eLife* 6:e28158 (2017).

- Wang, K. #, Sun, W. #, Richie, C.T., Harvey, B.K., Betzig, E. & Ji, N. Direct wavefront sensing for high-resolution imaging in highly scattering tissue. *Nature Communications* 6, 7276 (2015).
- Chen, B.#, Legant W.R.#, Wang, K. #, Shao, L., Milkie, D.E., Davidson, M.W., Janetopoulos, C., Wu, X.S., Hammer III, J.A., Liu, Z., English, B.P., Mimori-Kiyosue, Y., Romero, D.P., Ritter, A.T., Lippincott-Schwartz, J., Fritz-Laylin, L., Mullins, R.D., Mitchell, D.M., Bembenek, J.N., Reymann, A., Buhme, R., Grill, S.W., Wang, J.T., Seydoux, G., Tulu, U.S., Kiehart, D.P., Betzig, E. Lattice light sheet microscopy: imaging molecules to embryos at high spatiotemporal resolution. *Science* 346,1257998 (2014)
- Wang, K., Milkie, D. E., Saxena, A. Engerer, P., Misgeld, T., Bronner, M.E., Mumm, J. & Betzig, E. Rapid adaptive optical recovery of optimal resolution over large volumes. *Nature Methods* 11, 625-628 (2014).
- Wang, K. & Crozier, K.B. Plasmonic trapping with a gold nanopillar. *ChemPhysChem* 13, 2639-2648 (2012). (Invited)
- Wang, K., Schonbrun, E., Steinvurzel, P. & Crozier, K.B. Trapping and rotating nanoparticles using a plasmonic nano-tweezer with an integrated heat sink. *Nature Communications* 2, 469 (2011).
- Wang, K., Schonbrun, E. & Crozier, K.B. Scannable plasmonic trapping using a gold stripe. *Nano Letters* 10, 3506-3511 (2010).
- Wang, K., Schonbrun, E. & Crozier, K.B. Propulsion of Gold Nanoparticles with Surface Plasmon Polaritons: Evidence of Enhanced Optical Force from Near-Field Coupling between Gold Particles and Gold Film. *Nano Letters* 9, 2623-2629 (2009).

## IBRO LECTURES

### HYOUNG-GON KO



Ph.D., Department of Biological Sciences, College of Natural Sciences, Seoul National University, South Korea  
Department of Anatomy and Neurobiology, School of Dentistry, Kyungpook National University, Daegu, South Korea

### EDUCATION PROFILE

---

- 2011 Ph.D., (Neurobiology) Department of Biological Sciences, College of Natural Sciences, Seoul National University
- 2009 Visiting Graduate Student., Prof. Min Zhuo's Lab, Department of Physiology, University of Toronto, Canada
- 2005 B.S. (Biology & Philosophy- double major) Department of Biological Sciences, College of Natural Sciences and Department of Philosophy, College of Humanities, Seoul National University
- 2002 Military service

### HONORS AND AWARDS

---

- 2018 Basic Research Program in Science and Engineering, National Research Foundation, Korea
- 2011 Presidential Postdoc Fellowship, National Research Foundation, Korea
- 2011 Student of the Year (Ph.D.), College of Natural Sciences, Seoul National University
- 2010 Outstanding Student Poster Presentation, 2010 Brain and Mind research in the Asia Pacific (BMAP) Symposium
- 2010 Excellent Research Article, 2010 Symposium in Institute of Molecular Biology and Genetics, Seoul National University

## PUBLICATIONS

---

- Ko HG\*, Park DI\*, Lee JH, Turck CW, Kaang BK, Proteomic analysis of synaptic protein turnover in the anterior cingulate cortex after nerve injury, *Mol Brain*. 2020 Feb 12;13(1):19. doi: 10.1186/s13041-020-0564-y \* equal contribution
- Lee J, Yoon KJ, Park P, Lee C, Kim MJ, Han DH, Kim JI, Kim S, Lee HR, Lee Y, Jang EH, Ko HG, Kong YY, Kaang BK, *Neur1 and Neur2 are required for hippocampus-dependent spatial memory and synaptic plasticity*, *Hippocampus*. 2020 Jul 9. doi: 10.1002/hipo.23247. Online ahead of print.
- Park SK, Devi AP, Bae JY, Cho YS, Ko HG, Kim DY, Bae YC, Synaptic connectivity of urinary bladder afferents in the rat superficial dorsal horn and spinal parasympathetic nucleus, *J Comp Neurol*. 2019 Dec 15;527(18):3002-3013. (IF: 3.239, 2018)
- Park SK, Hong JH, Jung JK, Ko HG, Bae YC, Vesicular Glutamate Transporter 1 (VGLUT1)- and VGLUT2-containing Terminals on the Rat Jaw-closing  $\gamma$ -Motoneurons, *Exp Neurobiol*. 2019 Aug 31;28(4):451-457. (IF: 2.630, 2018)
- Ko HG, Ye S, Zhuo M, Kaang BK, Transcription-independent expression of PKM $\zeta$  in the anterior cingulate cortex contributes to chronically maintained neuropathic pain, *Mol Pain*, 2018 Jun 20; 14 (IF: 3.533, 2016), 33% in NEUROSCIENCE field (JCR)
- Choi JH, Sim SE, Kim Ji, Choi DI, Oh J, Ye S, Lee J, Kim TH, Ko HG, Lim CS, Kaang BK, Inter-regional Synaptic Maps Among Engram Cells Underlie Memory Formation, *Science*, 2018 Apr 27;360(6387):430-435 (IF: 37.205, 2016) 3% in MULTIDISCIPLINARY SCIENCES field (JCR)
- Ko HG\*, Choi JH\*, Park D, Kang SJ, Lim CS, Sim SE, Shim J, Kim JI, Kim S, Choi TH, Ye S, Lee J, Park P, Kim S, Do J, Park J, Islam MA, Kim HJ, Collingridge GL, Turck CW, Zhuo M, Kaang BK, Rapid turnover of cortical NCAM1 regulates synaptic reorganization after peripheral nerve injury, *Cell Reports*, 2018 Jan 16;22(3):748-759 \* equal contribution (IF: 8.282, 2016) 14% in CELL BIOLOGY field (JCR)
- Lim CS, Nam HJ, Lee J, Kim D, Choi JE, Kang SJ, Kim S, Kim H, Kwak C, Shim KW, Kim S, Ko HG, Lee RU, Jang EH, Yoo J, Shim J, Islam MA, Lee YS, Lee JH, Baek SH, Kaang BK, PKC $\alpha$ -mediated phosphorylation of LSD1 is required for presynaptic plasticity and hippocampal learning and memory, *Sci Rep.*, 2017 Jul 7;7(1):4912. (IF: 4.259, 2016) 16% in MULTIDISCIPLINARY SCIENCES field (JCR)
- Yoon SY, Kwon SG, Kim YH, Yeo JH, Ko HG, Roh DH, Kaang BK, Beitz AJ, Lee JH, Oh SB, A critical role of spinal Shank2 proteins in NMDA-induced pain hypersensitivity, *Mol Pain*, 2017 Jan;13:1744806916688902. (IF:3.533, 2016) 33% in NEUROSCIENCE field (JCR)

## IBRO LECTURES

### JAYA KUMAR



Senior lecturer, Department of Physiology, Faculty of  
Medicine, Universiti Kebangsaan, Malaysia  
Malaysian Society of Neurosciences

### EDUCATION PROFILE

---

- 2015 Ph.D in Neurophysiology (Universiti Sains Malaysia)
- 2008 Bachelor of Biomedical Sciences (Hons) (1st Class Honors; CGPA:3.754) (Universiti Putra Malaysia)

### HONORS AND AWARDS

---

- 2020 Young Researchers Award (Faculty of Medicine UKM)
- 2019 Young Teachers Award (Malaysian Society of Pharmacology and Physiology)
- 2019 Best Price for oral presentation at 11th Malaysia-Indonesia-Brunei Medical Conference
- 2019 Committee for Aid and Education in Neurochemistry (CAEN) award from International Society of Neurochemistry
- 2019 3rd Best Price for oral presentation at 29th Malaysian Scientific Meeting of Neuroscience (Malaysian Society of Neuroscience)
- 2018 Shortlisted for Young Investigator Award (Malaysian Society for Pharmacology and Physiology)
- 2018 Best Poster Award (Rampai Penyelidik Siri ke-7, 2018)
- 2018 Fellowship in Addiction Medicine (University of Malaya Centre for Addiction Science Studies)
- 2017 Anugerah Perkhidmatan Cemerlang (Excellence in service awards)

## PUBLICATIONS

- Ibrahim N.I, Yahaya M.F., Mohamed, W., Teoh, S.L., Hui, C.K., Kumar, J. Pharmacotherapy of Alzheimer's Disease: Seeking clarity in a time of uncertainty. *Frontiers in Pharmacology*, 2020, 11: 261 (Impact Factor: 3.845) (Corresponding Author)
- Hanim A, Mohamed IN, Mohamed RPM, Das S, Nor NSM, Harun RA, Kumar J. mTORC and PKC $\epsilon$  in Regulation of Alcohol Use Disorder. *Mini Reviews in Medicinal Chemistry*, 2020 (Accepted) (Impact Factor: 2.842) (Corresponding Author)
- Kumar J, Das S; Serum neurofilament light chain (NF-L) level as a biomarker of neurodegeneration and predictor of white-matter (WM) abnormality progression; a letter to editor. *European Journal of Neurology*, 2020 (Impact factor: 4.387) (Principal Author)
- Amid AA, Aminuddin A, Yunus MHM, Kumar J, Hui CK, Ugusman A. Antioxidative and anti-inflammatory activities of polygonum minus: a review of literature. *Reviews in Cardiovascular Medicine*, 2020 (Impact Factor: 0.610)
- Kamil K, Yazid MD, Idrus RBH, Kumar J. Hydroxytyrosol Promotes Proliferation of Human Schwann Cells: an in vitro study. *International Journal of Environmental Research and Public Health*, 2020 (Impact Factor: 2.468) (Corresponding Author)
- Kumar J, Das S; The effect of alcohol level on male and female drivers: Important facts; a letter to editor. *Drug and Alcohol Dependence*, 214 (2020): 108146 (Impact Factor: 3.951) (Principal Author)
- Prom-in, S.; Kaewsrichan, J.; Wangpradit, N.; Kien Hui, C.; Yahaya, M.F.; Kamisah, Y.; Kumar, J. *Abelmoschus Esculentus* (L.) Moench's Peel Powder Improves High-Fat-Diet-Induced Cognitive Impairment in C57BL/6J Mice. *Int. J. Environ. Res. Public Health* 2020, 17, 5513. (Impact Factor: 2.849) (Corresponding Author)
- Amilia Aminuddin, Md Rizman Md Lazin Md Lazim, Adila A. Hamid, Chua Kien Chua, Mohd Heikal Mohd Yunus, Jaya Kumar and Azizah Ugusman; The Association between Inflammation and Pulse Wave Velocity in Dyslipidemia: An Evidence-Based Review. *Mediators of Inflammation*, 2020. (Impact Factor: 3.758) (Accepted)
- Wangpradit N, Prom-in S, Kumar J, Hui Chua K, Ugusman A, Kamisah Y, et al. Hepatoprotective Effect of Germinated Sang-Yod Rice in Obese Mice. *Austin J Nutr Metab.* 2020; 7(2): 1080.
- Wangpradit N, Prom-in S, Kumar J, Chua KH, Kaewsrichan J (2020) Decrease of microglia and fatty liver in obese mice by germinated Sang-Yod rice. *Glob J Obes Diabetes Metab Syndr* 7(2): 036-041.
- Wangpradit N, Prom-in S, Kumar J, Chua KH, Ugusman A, et al. (2020) Modulation of Spatial Learning and Memory of Obese Mice by Germinated Sang-Yod Rice. *J Nutri Med Diet Care* 6:042.

## IBRO LECTURES

### RANJANA BHANDARI



Assistant Professor (Adhoc) & Researcher,  
University Institute of Pharmaceutical Sciences, Panjab  
University, Chandigarh, India

### EDUCATION PROFILE

---

- 2019 Assistant Professor in Pharmaceutics, University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India
- 2019 Ph.D., Pharmaceutical Sciences, Panjab University, Chandigarh, India
- 2018 ICMR-SRF Fellowship for PhD, Indian Council for Medical Research (ICMR)
- 2013 J.R.F., Pharmaceutical Sciences, UGC, New Delhi
- 2013 M.Sc., Pharmacy, Pharmaceutics, Panjab University, Chandigarh, India
- 2013 Masters Fellowship, University Grants Commission, New Delhi
- 2011 B.Sc., Pharmacy, Pharmaceutics, Panjab University, Chandigarh, India

### HONORS AND AWARDS

---

- 2019 Awarded Research Associateship (RA) by Central Council for Scientific and Industrial Research (CSIR), New Delhi
- 2019 Best Oral presentation Award for paper entitled “Brain-targeted Surface Engineered Delivery System of Naringenin as for Autism Spectrum Disorders” at 13th Chandigarh Science Congress
- 2019 Travel Award from International Brain Research Organization (IBRO) for attending and presenting at 10th IBRO World Congress, taking place in Daegu, South Korea
- 2018 Best paper award for paper entitled “Pharmacokinetic-pharmacodynamic (PKPD) Modeling of Effect of Naringenin & its Surface Modified Nanocarriers on Associated

- & Core Behaviours of Autism Spectrum Disorders (ASD) at 3rd International Brain Research Organization (IBRO) School held at Chandigarh
- 2018 Travel Award for attending and presenting at International Society For Autism Research 2018 Annual Meeting, taking place in de Doelen ICC Rotterdam, The Netherlands
- 2017 Best paper award for paper entitled “Neuropsychopharmacotherapeutic Effect of Naringenin & its Nanocarrier in Experimental Paradigm of Autism Spectrum Disorder” at 2nd International Brain Research Organization Symposium held at Chandigarh
- 2017 Best Poster Award at one day symposium “Next-Gen Challenges in Pharmaceutical Sciences” at Panjab University
- 2016 Best Poster Award in 1st IBRO/APRC Neuroscience Symposium 2016 held at Chandigarh

## PUBLICATIONS

---

- R Bhandari, JK Paliwal & A Kuhad. Development of a new, sensitive, and robust analytical and bio-analytical RP-HPLC method for invitro and in-vivo quantification of naringenin in polymeric nanocarriers. *Journal of Analytical Science and Technology*, Springer (2019) 10 (1), 11
- R Bhandari, A Kuhad & A Kuhad. Edaravone: a new hope for deadly amyotrophic lateral sclerosis. *Drugs of Today* 2018, 54(6): 349-360
- Sarabjit Kaur, Priya Manhas, Anuradha Swami, Ranjana Bhandari, Krishna K Sharma, Rahul Jain, Ravinder Kumar, Satish K Pandey, Anurag Kuhad, Rohit K Sharma, Nishima Wangoo. Bioengineered PLGA chitosan nanoparticles for brain targeted intranasal delivery of antiepileptic TRH analogues. *Chemical Engineering Journal*, Volume 346, 2018, Pages 630-639
- N Singh, Y Bansal, R Bhandari, L Marwaha, R Singh, K Chopra, A Kuhad. Resveratrol protects against ICV collagenase-induced neurobehavioral and biochemical deficits. *J Inflamm (Lond)*. 2017 Jun 9;14:14. doi: 10.1186/s12950017-0158-3. eCollection 2017. PubMed PMID: 28615993;
- N Singh, Y Bansal, R Bhandari, L Marwaha, R Singh, K Chopra, A Kuhad. Naringin Reverses Neurobehavioral and Biochemical Alterations in Intracerebroventricular Collagenase-Induced Intracerebral Hemorrhage in Rats. *Pharmacology*. 2017 Jul 1;100(3-4):172-187. doi: 10.1159/000453580. [Epub ahead of print] PubMed PMID: 28668949.
- Mehta, R., Bhandari, R., Kuhad, A., Kuhad, A. Zuranolone. GABAA receptor positive allosteric modulator, Treatment of major depressive disorder, Treatment of postpartum depression. *Drugs Fut* 2019, 44(6): 443
- A. Kaur Gill, Y. Bansal, R. Bhandari, S. Kaur, J. Kaur, R. Singh, A. Kuhad and A. Kuhad. Gepirone hydrochloride: a novel antidepressant with 5HT1A agonistic properties. *Drugs of Today*. 2019 55(7): 423-437



## IBRO LECTURES

### NICHOLAS PANG TZE PING



Department of Psychiatry, Universiti Malaysia Sabah,  
Sabah, Malaysia

### EDUCATION PROFILE

---

- 2003 SM All Saints, Kota Kinabalu, Malaysia
- 2006 Kolej Yayasan UEM, Kuala Lumpur, Malaysia
- 2011 MBBS, Newcastle University, United Kingdom
- 2018 Masters of Medicine (Psychiatry), Universiti Putra Malaysia
- 2014 pre MRCPsych Part 1,2,3 passed

### HONORS AND AWARDS

---

- 2019 1<sup>st</sup> REBAMP (Research and Education Center of Bridging Asian Mental Health and Psychiatry) Conference, Young Psychiatrist Travel Award, Tainan, Taiwan
- 2019 Finalist, Malaysian Psychiatric Association Postgraduate Research Award
- 2018 2<sup>nd</sup> Place, Malaysian national team, Asian Quizzing Championship

### PUBLICATIONS

---

- Pang N, Thrichelvam N, Naing NJ. Olanzapine-induced pancytopenia: A rare but worrying complication. *East Asian Archives of Psychiatry*. 2017 Mar;27(1):35.
- Pang N. Portrayals of child and adolescent psychiatry in mass fiction: focusing on Stieg Larsson's complete works. *Research & Humanities in Medical Education*. 2018 Feb 8;5:5-8.

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**SANDEEP ROBERT DATTA**



Professor, Department of Neurobiology, Harvard University, Boston, USA

**EDUCATION PROFILE**

- 2009 Postdoctoral Fellowship, Neurobiology, Columbia University
- 2004 MD., Ph.D., Neurobiology, Harvard University
- 1993 B.S., History / Molecular Biophysics and Biochemistry, Yale University

**HONORS AND AWARDS**

- 2018 John and Virginia Kaneb Fellowship
- 2015 NIH Director's New Innovator Award
- 2014 Bert I. Vallee Foundation Young Investigator
- 2014 Searle Scholars Program Fellowship
- 2014 McKnight Foundation Scholar
- 2014 Burroughs Wellcome Career Award
- 2012 Sloan Research Fellowship, Alfred P. Sloan Foundation
- 2012 Kavli Frontiers Fellow, Kavli Foundation and the National Academies of Science
- 2010 Jesse M. Sigelman M.D. Award for Innovation and Excellence
- 2008 K99/R00 NIH Pathway to Independence Award (declined)
- 2007 Helen Hay Whitney Postdoctoral Fellowship

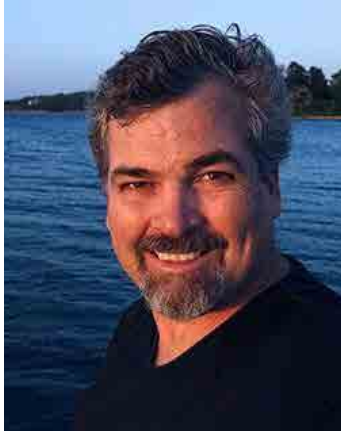
## PUBLICATIONS

---

- Finding the Brain in the Nose. Authors: Authors: Brann DH, Datta SR. *Annu Rev Neurosci* 2020-07-08
- Structure and flexibility in cortical representations of odour space. Authors: Authors: Pashkovski SL, Iurilli G, Brann D, Chicharro D, Drummey K, Franks K, Panzeri S, Datta SR. *Nature* 2020-07-01
- COVID-19 and the Chemical Senses: Supporting Players Take Center Stage. Authors: Authors: Cooper KW, Brann DH, Farruggia MC, Bhutani S, Pellegrino R, Tsukahara T, Weinreb C, Joseph PV, Larson ED, Parma V, Albers MW, Barlow LA, Datta SR, Di Pizio A. *Neuron* 2020-07-01
- Renewal and Differentiation of GCD Necklace Olfactory Sensory Neurons. Authors: Authors: Bloom ML, Johnston LB, Datta SR. *Chem Senses* 2020-04-25
- The striatum specifies the statistics of behavior. Authors: Authors: Markowitz JE, Datta SR. *Neuropsychopharmacology* 2020-01-01
- Computational Neuroethology: A Call to Action. Authors: Authors: Datta SR, Anderson DJ, Branson K, Perona P, Leifer A. *Neuron* 2019-10-09
- Q&A: Understanding the composition of behavior. Authors: Authors: Datta SR. *BMC Biol* 2019-05-29
- The Striatum Organizes 3D Behavior via Moment-to-Moment Action Selection. Authors: Authors: Markowitz JE, Gillis WF, Beron CC, Neufeld SQ, Robertson K, Bhagat ND, Peterson RE, Peterson E, Hyun M, Linderman SW, Sabatini BL, Datta SR. *Cell* 2018-06-28
- Filopodia Conduct Target Selection in Cortical Neurons Using Differences in Signal Kinetics of a Single Kinase. Authors: Mao YT, Zhu JX, Hanamura K, Iurilli G, Datta SR, Dalva MB. *Neuron* 2018-05-16
- Markowitz JE, Gillis WF, Beron CC, Neufeld SQ, Robertson K, Bhagat ND, Peterson RE, Peterson E, Hyun M, Linderman SW, Sabatini BL and Datta SR. (2018). The striatum organizes 3D behavior via moment-to-moment action selection. *Cell* 174:44. PMID: PMC6026065 (cover article)
- Datta SR, Anderson DJ, Branson K, Perona P, and Leifer A (2019). Computational neuroethology: a call to action. *Neuron* 104:11. PMID: in process
- Pisanello F, Mandelbaum G, Pisanello M, Oldenburg IA, Sileo L, Markowitz JE, Peterson RE, Della Patria Andrea, Haynes TM, Emara MS, Spagnolo B, Datta SR, Sabatini BL and De Vittori M. (2017). Dynamic illumination of spatially restricted or large brain volumes via a single tapered optical fiber. *Nature Neuroscience*, 20:1180. PMID: PMC5533215
- Pashkovski S, Iurilli G, Brann D, Chicharro D, Drummey K, Franks K, Panzeri S and Datta SR. (2019).

INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

**MATTHEW DALVA**



Department of Neuroscience, Thomas Jefferson University,  
Philadelphia, USA

Vice Chair at Thomas Jefferson University Hospitals

**EDUCATION PROFILE**

- 1996 PhD (Neurobiology) Duke University: Durham, NC, US
- 1990 AB Stanford University: Stanford, CA, US

**HONORS AND AWARDS**

- 1992 National Science Foundation Pre-doctoral Fellowship (Honorable Mention)
- 1998-2001 Chiron Life Science Foundation Fellow
- 2003 McCabe Foundation Fellow
- 2003-2008 43rd Mallinckrodt Foundation Fellow
- 2005-2007 MRDDRC/Philadelphia Foundation Fellow (CHOP)
- 2005-2008 Whitehall Foundation Fellow
- 2005 University of Pennsylvania Nominee for Merck Scholar Award
- 2006 University of Pennsylvania Nominee for Merck Scholar Award
- 2009 Dana Foundation Brain-Immuno Imaging Award
- 2013 Jefferson-Weizmann Award
- 2014 Deans Transformational Award
- 2015 Theme Team Award – Synapse Biology

## PUBLICATIONS

- Washburn, HR, Xia, NL, Zhou, W, Mao, YT, Dalva, MB. The N-terminal domain of GluN1 mediates NMDAR synaptic stability and the EphB-NMDAR interaction. *Nat Commun.* 2020 Jan 29;11(1):570. doi: 10.1038/s41467-020-14345-6. PMID:31996679
- Henderson, N, Le Marchand, S, Hruska, M., Hippenmeyer, S, Luo, L, Dalva, MB. Ephrin-B3 controls excitatory synapse density through cell-cell competition for EphBs. *Elife.* 2019 Feb 21;8. pii: e41563. doi: 10.7554/eLife.41563. PMID:30789343
- Barber, KR, Hruska, m, Bush, K, Martinez, J, Fei, H, Levitan, IB, Dalva, MB and Wairkar, Y. Levels of Par-1 kinase determine the localization of Bruchpilot at the Drosophila neuromuscular junction synapses. *Sci Rep.* 2018 Oct 31;8(1):16099. doi: 10.1038/s41598-018-34250-9. PMID: 30382129
- Mao, YT, Zhu, JX, Hanamura, K, Iurilli, G, Datta, SR, and Dalva, MB. Filopodia conduct target selection using differences in signal kinetics of a single kinase. *Neuron.* 2018, DOI: 10.1016/j.neuron.2018.04.011, PMID: 29731254
- Positive surface charge of GluN1 N-terminus mediates the direct interaction with EphB2 and NMDAR mobility., Washburn, H.R., Xia, N.L., Zhou, W., Mao, Y.-T., Dalva, M.B., 2020., *Nature Communications*
- Ephrin-B3 controls excitatory synapse density through cell-cell competition for EphBs., Henderson, N.T., Le Marchand, S.J., Hruska, M., (...), Luo, L., Dalva, M.B., 2019.,
- Levels of Par-1 kinase determine the localization of Bruchpilot at the Drosophila neuromuscular junction synapses., eLife Barber, K.R., Hruska, M., Bush, K.M., (...), Dalva, M.B., Wairkar, Y.P., 2018., *Scientific Reports*
- EphBs and ephrin-Bs: Trans-synaptic organizers of synapse development and function., Henderson, N.T., Dalva, M.B., 2018., *Molecular and Cellular Neuroscience*
- Filopodia Conduct Target Selection in Cortical Neurons Using Differences in Signal Kinetics of a Single Kinase., Mao, Y.-T., Zhu, J.X., Hanamura, K., (...), Datta, S.R., Dalva, M.B., 2018., *Neuron*
- Synaptic nanomodules underlie the organization and plasticity of spine synapses., Hruska, M., Henderson, N., Le Marchand, S.J., Jafri, H., Dalva, M.B., 2018., *Nature Neuroscience*
- Extracellular phosphorylation of a receptor tyrosine kinase controls synaptic localization of NMDA receptors and regulates pathological pain., Hanamura, K., Washburn, H.R., Sheffler-Collins, S.I., (...), Price, T.J., Dalva, M.B., 2017., *PLoS Biology*
- Synergistic integration of netrin and ephrin axon guidance signals by spinal motor neurons., Poliak, S., Morales, D., Croteau, L.-P., (...), Kao, T.-J., Kania, A., 2015., *eLife*
- Anchoring and synaptic stability of PSD-95 is driven by ephrin-B3., Hruska, M., Henderson, N.T., Xia, N.L., Le Marchand, S.J., Dalva, M.B., 2015., *Nature Neuroscience*

**INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE**

**SHERNAZ XERXES BAMJI**



Professor, Department of Cellular and Physiological Sciences, University of British Columbia, Canada

**EDUCATION PROFILE**

- 2005 PDF., Neurobiology, University of California, San Francisco (UCSF)
- 1999 Ph.D., Neurobiology, Montreal Neurological Institute - McGill University
- 1993 M.Sc., Zoology, University of Toronto
- 1992 B.Sc., Biology, University of Toronto

**HONORS AND AWARDS**

- 2007 Canadian Institute of Health Research (Young Investigator Award)
- 2006 Michael Smith Foundation for Health Research (Career Development Award)
- 2006 Michael Smith Foundation for Health Research (Young Investigator Award)
- 2005 TULA Investigator (endowed chair associated with the Brain Research Centre, UBC)
- 2002 Human Frontiers Science Project Long-Term Fellowship
- 1999 Medical Research Council (MRC) Research Fellowship (declined)
- 1999 National Sciences and Engineering Research Council of Canada Fellowship (NSERC) (declined)
- 1998 Medical Research Council (MRC) Research Studentship
- 1997 Network for the Centers of Excellence Studentship (Research Supplement)
- 1995 Rick Hansen Man in Motion Studentship

## PUBLICATIONS

- Shimell JJ, Shah BS, Cain SM, Thouta S, Kuhlmann N, Tatarnikov I, Jovellar DB, Brigidi GS, Kass J, Milnerwood AJ, Snutch TP, Bamji SX. The X-Linked Intellectual Disability Gene *Zdhhc9* Is Essential for Dendrite Outgrowth and Inhibitory Synapse Formation. *Cell Rep.* 2019 Nov 19;29(8):24222437.e8.doi:10.1016/j.celrep.2019.10.065.
- Post KL, Belmadani M, Ganguly P, Meili F, Dingwall R, McDiarmid TA, Meyers WM, Herrington C, Young BP, Callaghan DB, Rogic S, Edwards M, Niciforovic A, Cau A, Rankin CH, O'Connor TP, Bamji SX, Loewen CJR, Allan DW, Pavlidis P, Haas K. Multi-model functionalization of disease-associated PTEN missense mutations identifies multiple molecular mechanisms underlying protein dysfunction. *Nat Commun.* 2020 Apr 29;11(1):2073. doi: 10.1038/s41467-020-15943-0.
- Shah BS, Shimell JJ, Bamji SX. Regulation of dendrite morphology and excitatory synapse formation by *zDHHC15*. *J Cell Sci.* 2019 Jul 5;132(13):jcs230052. doi: 10.1242/jcs.230052.
- Lu L, Hogan-Cann AD, Globa AK, Lu P, Nagy JI, Bamji SX, Anderson CM. (2019) Astrocytes drive cortical vasodilatory signaling by activating endothelial NMDA receptors. *J Cereb Blood Flow Metab.* Mar;39(3):481-496. doi:10.1177/0271678X17734100. Epub 2017 Oct 26.
- Globa AK, Bamji SX. (2017) Protein palmitoylation in the development and plasticity of neuronal connections. *Curr Opin Neurobiol.* Aug;45:210-220. doi: 10.1016/j.conb.2017.02.016. Epub 2017 Mar 30.
- Mills F, Globa AK, Liu S, Cowan CM, Mobasser M, Phillips AG, Borgland SL, Bamji SX. (2017) Cadherins mediate cocaine-induced synaptic plasticity and behavioral conditioning. *Nature Neurosci.* Apr;20(4):540-549. doi:10.1038/nn.4503. Epub 2017 Feb 13.
- Liu S, Globa AK, Mills F, Naef , Bamji SX, Borgland SL. (2016) Rapid and lasting increase in synaptic density onto ventral tegmental area dopamine neurons following short-term exposure to palatable food *Proc Natl Acad Sci U S A.* Mar 1;113(9):2520-5.
- Brigidi S, Santyr B, Shimell J, Jovellar B, and Bamji SX, (2015) Activity-Regulated Trafficking of the Palmitoyl-Acyl Transferase *DHHC5*. *Nature Commun* 6:8200 PMID: 26334723
- Mills F, Bartlett T, Dissing-Olesen L, Wisniewska MB, Kuznicki K, MacVicar BA, Wang YT, Bamji SX. (2014) Behavioral flexibility and synapse plasticity requires weakening of cadherin adhesion complexes. *Proc Natl Acad Sci U S A.* Jun 10;111(23):8631-6. PMID:24912177
- Baronas V, McGuinness B, Brigidi GS, Gomm R, Vilin Y, Kim R, Lynn F, Bamji SX, Yang R, and Kurata H. (2015). Use-dependent activation of neuronal *Kv1.2* channel complexes. *J. Neurosci* Feb 25;35(8):3515-24. doi:10.1523/JNEUROSCI.4518-13.2015.



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**TOMOMI SHIMOGORI**



Lab for Molecular Mechanisms of Brain Development,  
Center for Brain Science, RIKEN, Japan

**EDUCATION PROFILE**

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- 1998 Ph.D., Pharmaceutical Sciences, Graduate School, Chiba University, Chiba, Japan
- 1993 B.A. Hoshi Collage of Pharmacy, Tokyo, Japan

**ACADEMIC APPOINTMENTS**

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- 2018 RIKEN CBS Team Leader of Lab for Molecular Mechanisms of Brain Development
- 2018 RIKEN BSI Team Leader of Lab for Molecular Mechanisms of Thalamus Development
- 2010 RIKEN BSI Unit Leader of Shimogori Research Unit
- 2004 Dept. Neurobiology, Pharmacology and Physiology, University of Chicago, USA  
Laboratory of Dr. Elizabeth A. Grove

## PUBLICATIONS

- Peng J, Fabre PJ, Dolique T, Swikert SM, Kermasson L, Shimogori T, Charron F. (2018) Sonic Hedgehog Is a Remotely Produced Cue that Controls Axon Guidance Trans-axonally at a Midline Choice Point. *Neuron*. 97:326-340.e4. doi: 10.1016/j.neuron.2017.12.028.
- Shimogori T, Abe A, Go Y, Hashikawa T, Kishi N, Kikuchi SS, Kita Y, Niimi K, Nishibe H, Okuno M, Saga K, Sakurai M, Sato M, Serizawa T, Suzuki S, Takahashi E, Tanaka M, Tatsumoto S, Toki M, U M, Wang Y, Windak KJ, Yamagishi H, Yamashita K, Yoda T, Yoshida AC, Yoshida C, Yoshimoto T, Okano H. in press. Digital gene atlas of neonate common marmoset brain. *Neurosci Res*. doi: 10.1016/j.neures.2017.10.009.
- Alchini R, Sato H, Matsumoto N, Shimogori T, Sugo N, Yamamoto N. (2017) Nucleocytoplasmic Shuttling of Histone Deacetylase 9 Controls Activity-Dependent Thalamocortical Axon Branching. *Sci Rep*. 20:6024. doi: 10.1038/s41598-017-06243-7.
- Watson C, Shimogori T, Puelles L. (2017) Mouse Fgf8-Cre-LacZ lineage analysis defines the territory of the postnatal mammalian isthmus. *J Comp Neurol*. 2017 May 16. doi: 10.1002/cne.24242.
- Kawata M, Taniguchi Y, Mori D, Yano F, Ohba S, Chung UI, Shimogori T, Mills AA, Tanaka S, Saito T. (2017) Different regulation of limb development by p63 transcript variants. *PLoS One*. 12:e0174122. doi:10.1371/journal.pone.0174122.
- Okano H, Sasaki E, Yamamori T, Iriki A, Shimogori T, Yamaguchi Y, Kasai K, Miyawaki A. (2016) Brain/MINDS: A Japanese National Brain Project for Marmoset Neuroscience. *Neuron* 92:582-590. doi:10.1016/j.neuron.2016.10.018.
- Kino Y, Washizu C, Kurosawa M, Yamada M, Doi H, Takumi T, Adachi H, Katsuno M, Sobue G, Hicks GG, Hattori N, Shimogori T, Nukina N. (2016) FUS/TLS acts as an aggregation-dependent modifier of polyglutamine disease model mice. *Sci Rep*. 6:35236. doi: 10.1038/srep35236.
- Yamanaka T, Tosaki A, Miyazaki H, Kurosawa M, Koike M, Uchiyama Y, Maity SN, Misawa H, Takahashi R, Shimogori T, Hattori N, Nukina N. (2016) Differential roles of NF-Y transcription factor in ER chaperone expression and neuronal maintenance in the CNS. *Sci Rep*. 6:34575. doi: 10.1038/srep34575.
- Minoura I, Takazaki H, Ayukawa R, Saruta C, Hachikubo Y, Uchimura S, Hida T, Kamiguchi H, Shimogori T, Muto E. (2016) Reversal of axonal growth defects in an extraocular fibrosis model by engineering the kinesin-microtubule interface. *Nat Commun*. 7:10058. doi: 10.1038/ncomms10058.
- Yamanaka T, Tosaki A, Kurosawa M, Shimogori T, Hattori N, Nukina N. (2016) Genome-wide analyses in neuronal cells reveal that USF transcription factors regulate lysosomal gene expression. *FEBS J*. doi: 10.1111/febs.13650.

INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

YIMIN ZOU



Professor, Department of Neurobiology, University of California San Diego, USA

EDUCATION PROFILE

- 2006 Assistant and Associate Professor at the University of Chicago
- 2000 Postdoctoral fellowship at University of California, San Francisco
- 1996 Postdoctoral Fellowship, University of California, San Diego
- 1995 Ph.D., Biochemistry and Molecular Biology, University of California, Davis and San Diego
- 1988 B.S., Genetics., Dept of Genetics, Fudan University, Shanghai

HONORS AND AWARDS

- 2019 Brain Health Institute Plenary Lecture at Rutgers University. New Brunswick, New Jersey
- 2019 Plenary lecture at Brain and Brain PET 2019. Yokohama, Japan
- 2019 NIH Javits Neuroscience Investigator Award
- 2017 Plenary Speaker at the 12th Biennial Conference of Chinese Neuroscience Society. Tianjin, China
- 2014 Director's Seminar Series Institute of Biophysics Chinese Academy of Sciences. Beijing, China
- 2013 Premier Lecture Series Chinese Academy of Sciences. Beijing, China
- 2013, 2018 Honorary Professor of the University of Hong Kong
- 2012 S.T.Huang-Chan Memorial Lecture Hong Kong University, Hong Kong, China

- 2009 Killam Research Seminar the Montreal Neurological Institute McGill University. Montreal, Canada
- 2006 Gail Beach Memorial Seminar Series at the University of Miami Miller School of Medicine Miami, Florida
- 2006 Keynote Speaker at Midwest Student Biomedical Research Forum. Omaha, Nebraska
- 2003, 2005 Alfred P. Sloan Research Fellow Award
- 2003 W.M.Keck Foundation Research Achievement Award (Semi-finalist in Keck Young Scholar Competition)
- 1999-2000 Postdoctoral Fellowship from the Spinal Cord Research Foundation
- 2002, 2005 Schweppe Foundation Career Development Award
- 2002, 2004 March of Dimes Basil O'Connor Starting Scholar Research Award

## PUBLICATIONS

- Keisuke Onishi, Runyi Tian, Bo Feng, Yiqiong Liu, Junkai Wang, Yinan Li, and Yimin Zou. LRRK2 mediates axon development by regulating Frizzled3 phosphorylation and growth cone–growth cone communication. *Proc Natl Acad Sci U S A*. first published July 8, 2020 <https://doi.org/10.1073/pnas.1921878117>.
- Yimin Zou. Breaking symmetry - cell polarity signaling pathways in growth cone guidance and synapse formation. *Curr Opin Neurobiol*. 2020 Apr 29;63:77-86. doi: 10.1016/j.conb.2020.03.010. Online ahead of print. PMID: 32361599
- John Scott, Sonal Thakar, Ye Mao, Huaping Qin, Helen Hejran, Su-Yee Lee, Ting Yu, Olga Klezovitch, Hongqiang Cheng, Yongxin Mu, Sourav Ghosh, Valeri Vasioukhin, and Yimin Zou. Apical-basal polarity signaling components, Lgl1 and aPKCs, control glutamatergic synapse number and function. *iScience*. 2019 Sep 9;20:25-41. doi: 10.1016/j.isci.2019.09.005. [Epub ahead of print] (PMID:31546104)
- Keisuke Onishi and Yimin Zou. Sonic Hedgehog switches on Wnt/planar cell polarity signaling in commissural axon growth cones by reducing levels of Shisa2. *Elife*. 2017 Sep 8;6. pii: e25269. doi: 10.7554/eLife.25269.
- Sonal Thakar, Liqing Wang, Ting Yu, Mao Ye, Keisuke Onishi, John Scott, Jiaxuan Qi, Catarina Fernandes, Darwin Berg and Yimin Zou\*. Evidence for opposing roles of Celsr3 and Vangl2 in glutamatergic synapse formation. *Proc Natl Acad Sci U S A*. 2017 Jan 5. pii: 201612062. doi: 10.1073/pnas.1612062114. [Epub ahead of print] PMID: 28057866
- Edmund Hollis 2nd, Nao Ishiko, Ting Yu, Chin-Chun Lu, Ariela Haimovich, Kristine Tolentino, Alisha Richman, Anna Tury, Shih-Hsiu Wang, Maysam Pessian, Euna Jo, Alex Kolodkin and Yimin Zou. Ryk controls remapping of motor cortex during functional recovery after spinal cord injury. *Nature Neurosci*. 2016 May;19(5):697-705

INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

**JOHN J. NGAI**



Director, NIH BRAIN Initiative  
National Institute of Neurological Disorder and Stroke,  
National Institutes of Health, USA

**EDUCATION PROFILE**

- 1987 Ph.D. (Biology), California Institute of Technology Pasadena, CA (mentor: Elias Lazarides)
- 1981 Harvard Medical School Program on Cell and Developmental Biology Boston, MA
- 1980 B.A. (Chemistry & Zoology), Pomona College Claremont, CA

**HONORS AND AWARDS**

- 2001 Coates Family Endowed Chair in Neuroscience
- 1998 Pew Scholar in the Biomedical Sciences
- 1996 McKnight Scholars Award in Neuroscience
- 1995 Alfred P. Sloan Research Fellow
- 1995 Class of 1933 Endowed Chair
- 1991 Howard Hughes Fellow of the Life Sciences Research Foundation
- 1987 Ferguson Prize for best thesis in the Division of Biology, California Institute of Technology
- 1983 National Science Foundation Predoctoral Fellowship
- 1980 Elected to Phi Beta Kappa
- 1980 Vaile Prize in Biology, Pomona College
- 1979 Elected to Sigma Xi
- 1980 Pomona College Scholar

## PUBLICATIONS

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- Pool, A.-H., T. Wang, D. Stafford, R. Chance, S. Lee, J. Ngai, and Y. Oka. 2020. Cellular basis of distinct thirst modalities. *Nature*, in press.
- D. H. Brann, T. Tsukahara, C. Weinreb, M. Lipovsek, K. Van den Berge, B. Gong, R. Chance, I. C. Macaulay, H.-j. Chou, R. B. Fletcher, D. Das, K. Street, H. Roux de Bezieux, Y.G. Choi, D. Risso, S. Dudoit, E. Purdom, J. Mill, R. A. Hachem, H. Matsunami, D. W. Logan, B. J. Goldstein, M. S. Grubb, J. Ngai, and S. R. Datta. 2020.
- Non-neuronal expression of SARS-CoV-2 entry genes in the olfactory system suggests mechanisms underlying COVID-19-associated anosmia. *Science Advances* 6, eabc5801.
- Covello, G., F.J. Rossello, M. Filosi, F. Gajardo, A.-L. Duchemin, B.F. Tremonti, M. Eichenlaub, J.M. Polo, D. Powell, J. Ngai, M.L. Allende, E. Domenici, M. Ramialison, and L. Poggi. 2020. Transcriptome analysis of the zebrafish *atoh7*<sup>-/-</sup> Mutant, *lakritz*, highlights *Atoh7*-dependent genetic networks with potential implications for human eye diseases. *FASEB BioAdvances* 2, 434-448.
- Das, D., R.B. Fletcher and J. Ngai. 2019. Cellular mechanisms of epithelial stem cell self-renewal and differentiation during homeostasis and repair. *WIREs Developmental Biology* Aug 29:e361 doi: 10.1002/wdev.361
- Cole\*, M.B., D. Risso\*, A. Wagner, D. DeTomaso, J. Ngai, E. Purdom, S. Dudoit and N. Yosef. 2019.
- Performance assessment and selection of normalization procedures for single-cell RNA-Seq. *Cell Systems* 8, 315-328. \* equal contribution
- Naka, A., J. Veit, B. Shababo, R.K. Chance, D. Risso, D. Stafford, B. Snyder, A. Egladyous, D. Chu, S. Sridharan, L. Paninski, J. Ngai and H. Adesnik. 2019.
- Complementary networks of cortical somatostatin interneurons enforce layer specific control. *eLife* 8:e43696.
- Mukamel, E.A. and J. Ngai. 2019. Perspectives on defining cell types in the brain. *Current Opinions in Neurobiology* 56, 61-68.
- Risso, D., L. Purvis, R.B. Fletcher, D. Das, J. Ngai, S. Dudoit and E. Purdom. 2018. clusterExperiment and RSEC: A Bioconductor package and framework for clustering of single-cell and other large gene expression datasets. *PLoS Computational Biology* 14(9):e1006378.
- Fletcher, R.B., D. Das and J. Ngai. 2018. Creating lineage trajectory maps via integration of single-cell RNA sequencing and lineage tracing. *Bioessays* 40, 1800056. DOI: 10.1002/bies.201800056
- Street, K., D. Risso, R.B. Fletcher, D. Das, J. Ngai, N. Yosef, E. Purdom and S. Dudoit. 2018. Slingshot: cell lineage and pseudotime inference for single-cell transcriptomics. *BMC Genomics* 19, 477.

INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

**ANNA BEYELER**



Beyeler Lab, INSERM Bordeaux, France

**EDUCATION PROFILE**

- 2009 Doctoral thesis University of Bordeaux
- 2006 Neurosciences Master University of Bordeaux
- 2004 Biochemistry Licence University of Bordeaux
- 2003 Life science general university diploma University of Bordeaux
- 2001 Scientific high school diploma High school of Bergerac

**HONORS AND AWARDS**

- 2020 Research fund of the Region Nouvelle-Aquitaine
- 2019 NRJ - Institut de France Research support
- 2021 ATIP-Avenir grant of the French National Institutes of Health (INSERM)
- 2021 Welcome package of Bordeaux Neurocampus
- 2019 University of Bordeaux Excellence Funding IdEx
- 2016 Finalist of the Eppendorf and Science Prize for Neurobiology
- 2016 American College of Neuropsychopharmacology (ACNP) travel award
- 2018 Brain and Behavior Foundation NARSAD Young Investigator Grant
- 2015 Gordon Research Conference Poster Prize
- 2015 Swiss National Science Foundation (SNSF) Post-Doctoral Fellowship
- 2013 Science illustration Prize of the Picower Institute for Learning and Memory, MIT
- 2014 Swiss National Science Foundation (SNSF) Post-Doctoral fellowship

## PUBLICATIONS

---

### Review articles (7, including 6 as corresponding author)

- Beyeler A\*\* & Dabrovska J\*\*. Neuronal diversity of the amygdala and the bed nucleus of the stria terminalis. Handbook of amygdala structure and function, Chapter 3, 2020
- Daviu N, Bruchas MR, Moghaddam B, Sandi C, Beyeler A\*\*. Neurobiological links between stress and anxiety, *Neurobiology of Stress* 2019
- Beyeler A\*\*. Do antidepressants restore lost synapses? *Science* 2019 (commentary)
- Pignatelli M. & Beyeler A\*\*. Valence coding in amygdala circuits. *Current Opinion in Behavioral Sci.* 2019
- Beyeler A\*\*. Parsing reward from aversion, investigating the neural circuits encoding emotional valence. *Science* 2016 (essay)

### Research articles (14, including 8 as first author and 1 as last author)

- Ju A, Fernandez-Arroyo B, Wu Y, Jacky D, Beyeler A\*\*. Expression of serotonin 1A and 2A receptors in molecular- and projection-defined neurons of the mouse insular cortex. *Molecular Brain* 2020
- Wu Y, Delcasso S, Ju A, Supiot L, Nicolas C, Vřiritř A, Masson M, Jacky D, Beyeler A\*\*. Divergent role of the anterior and posterior insular cortex in anxiety- and valence-related behaviors. in preparation
- Serrat R,...17 co-authors..., Beyeler A, Pouvreau S, Marsicano G. Astrocyte ER/mitochondrial calcium transfer determines synaptic integration. under review at *Neuron*
- Zhao Z,...10 co-authors..., Beyeler A, Marsicano G. Top-down control of water intake by the endo-cannabinoid system. *Current Biology*, 2020
- Vander Weele CM, ...13 co-authors..., Beyeler A, Tye KM. Dopamine increases signal-to-noise in cortical-brainstem responses to aversive stimuli. *Nature* 2018
- Allsop SA,...18 co-authors..., Beyeler A, Tye KM. Observational learning requires cortico-amygdala transfer of socially-derived information. *Cell* 2018
- Chatterjee S,...18 co-authors..., Beyeler A, Tye KM, Wickersham IR. Nontoxic, double deletion mutant rabies viral vectors for retrograde targeting of projection neurons. *Nature Neuroscience* 2018
- Beyeler A\*\*, Chang C-J, Silvestre M, Lřvkque C, Namburi P, Wildes CP, Tye KM\*\*. Organization of valence-encoding and projection-defined neurons in the basolateral amygdala. *Cell Reports* 2018
- Burgos-Robles A,...12 co-authors..., Beyeler A, Tye KM. Amygdala inputs to prefrontal cortex guide behavior amid conflicting cues of reward and punishment. *Nature Neuroscience* 2017
- Beyeler A\*, Namburi P\*, Głober, GF, Simonnet C, Calhoon GG, Conyers GF, Luck R, Wildes CP, Tye KM. Divergent routing of positive and negative information from the amygdala during memory retrieval. *Neuron* 2016



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**JENS HJERLING LEFFLER**



Department of Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden

**EDUCATION PROFILE**

---

- 2015 Assistant Professor, MBB, Karolinska Institutet, Stockholm, Sweden
- 2015 Senior Researcher, MBB, Karolinska Institutet, 100% research.
- 2011 Gordon Fishel lab, NYU School of Medicine, New York, NY, USA
- 2007 Martin Koltzenburg lab, Institute of Child Health, UCL, London, UK
- 2006 MD, Biochemistry. Medical Faculty, MBB, Karolinska Institutet, Stockholm, Sweden.
- 1999 Program for Mathematics and Natural sciences (Biology) Lunds Universitet, Lund, Sweden

**HONORS AND AWARDS**

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- 2018 ERC Consolidator Award
- 2018 VR (Swedish Research Council) Consolidator Award
- 2016 Marie Curie Career Integration Grant
- 2015 VR (Swedish Research Council) Assistant Professorship grant
- 2015 Young Academy of Sweden (Sverige unga akademi), elected member
- 2014 ENI-NET young investigator fellow
- 2011 SSMF (Swedish society for medical research) fellow
- 2009 EMBO long-term fellow
- 2007 Hjärnfonden (Swedish brain foundation) Post doctoral fellow

## PUBLICATIONS

- Xiaoyan Qian, Kenneth D. Harris, Thomas Hauling, Dimitris Nicoloutsopoulos, Ana B. Mucoz-Manchado, Nathan Skene, Jens Hjerling-Leffler & Mats Nilsson. Probabilistic cell typing enables fine mapping of closely related cell types in situ. *Nat Methods*. 2019
- Abdo H, Calvo-Enrique L, Lopez JM, Song J, Zhang MD, Usoskin D, El Manira A, Adameyko I, Hjerling-Leffler J, Ernfors P. Specialized cutaneous Schwann cells initiate pain sensation. *Science*. 2019 Aug 16;365(6454):695-699. doi: 10.1126/science.aax6452. PMID: 31416963
- Mucoz-Manchado AB, Bengtsson Gonzales C, Zeisel A, Munguba H, Bekkouche B, Skene NG, L nnerberg P, Ryge J, Harris KD, Linnarsson S, Hjerling-Leffler J. Diversity of Interneurons in the Dorsal Striatum Revealed by Single-Cell RNA Sequencing and PatchSeq. *Cell Rep*. 2018 Aug 21;24(8):2179-2190.e7. doi: 10.1016/j.celrep.2018.07.053. PMID: 30134177
- Zeisel A, Hochgerner H, L nnerberg P, Johnsson A, Memic F, van der Zwan J, H ring M, Braun E, Borm LE, La Manno G, Codeluppi S, Furlan A, Lee K, Skene N, Harris KD, Hjerling-Leffler J, Arenas E, Ernfors P, Marklund U, Linnarsson S. Molecular Architecture of the Mouse Nervous System. *Cell*. 2018 Aug 9;174(4):999-1014.e22. doi: 10.1016/j.cell.2018.06.021 PMID: 30096314
- Harris KD, Hochgerner H, Skene NG, Magno L, Katona L, Bengtsson Gonzales C, Somogyi P, Kessaris N, Linnarsson S, Hjerling-Leffler J. Classes and continua of hippocampal CA1 inhibitory neurons revealed by single-cell transcriptomics. *PLoS Biol*. 2018 Jun 18;16(6):e2006387. doi:10.1371/journal.pbio.2006387. eCollection 2018 Jun. PMID: 29912866
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- Zeisel A, Mucoz-Manchado AB, Codeluppi S, L nnerberg P, La Manno G, Juri us A, Marques S, Munguba H, He L, Betsholtz C, Rolny C, Castelo-Branco G, Hjerling-Leffler J\*, Linnarsson S\*. Brain structure. Cell types in the mouse cortex and hippocampus revealed by single-cell RNA-seq. *Science*. 2015 Mar 6;347(6226):1138-42. doi: 10.1126/science.aaa1934. Epub 2015 Feb 19. PMID: 25700174 \*Shared corresponding author
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## NEUROSCIENCE

### TSOLMON JADAMBA



Professor, President  
Mongolian National University of Medical Sciences

### EDUCATION PROFILE

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- 2011 PhD, Mongolian National University of Medical Sciences
- 1996 MS., Mongolian National University of Medical Sciences
- 1995 BA., International Relations and Public Administration, National University of Mongolia
- 1992 DDS., Moscow State University of Medicine and Dentistry

### WORK EXPERIENCE

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- 2018 President of the Mongolian National University of Medical Sciences
- 2018 Advisor to the Minister of Education, Culture, Science, and Sport of Mongolia
- 2012 Vice-Minister of Ministry of Health
- 2007 Head, International Relations office for the International Institute of Nomadic Civilization
- 1995 Lecturer, National Medical University in Mongolia

### PUBLICATIONS

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- Ganmaa D., Tsolmon J., et.al. Vitamin D Supplements for Prevention of Tuberculosis Infection and Disease, N Engl J Med 2020; 383:359-368

## PUBLIC LECTURES ON BRAIN SCIENCE

### DAMDINDORJ BOLDBAATAR

Dean, Graduate School, Mongolian National University of  
Medical Sciences



### EDUCATION PROFILE

- 2012 Postdoctor (Neurophysiology), Graduate School, Jichi Medical University, Japan
- 2010 Ph.D in Medicine, Graduate School, Jichi Medical University, Japan
- 2005 Master in Medicine, Graduate School, Health Sciences University of Mongolia
- 2003 Medical Doctor, Health Sciences University of Mongolia

### PUBLICATIONS

- “The Regulation of Energy Metabolism: An Important Facet of P53 Function” Marc Gilbert<sup>1</sup>, Enkhsaikhan Lkhagvasuren<sup>2</sup>, Damdindorj Boldbaatar<sup>3</sup>, Christophe Magnan<sup>1</sup> Cent Asian J Med Sci 2017;3:106-115
- Assessing risk of sleep apnea in obese and non obese adults, a hospital based casecontrol study. Renchindorj E, Norov T, Munkhtulga G, Adiyakhuu O, Damdindorj B. Divcovery-2015: 8; 20-22, Ulaanbaatar, Mongolia
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- Ghrelin signaling in  $\beta$ -cells regulates insulin secretion and blood glucose. Yada T, Damdindorj B et al Diabetes Obes Metab. 2014 Sep;16 Suppl 1:111-7.

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- グレリンによるインスリン分泌制御と膵β細胞シグナル伝達機構の解明. Boldbaatar Damdindorj. Jichi Medical University (33): 201-202
- Stressor-responsive central nesfatin-1 activates corticotropin-releasing hormone, noradrenaline and serotonin neurons and evokes hypothalamic-pituitary-adrenal axis. Natsu Yoshida, Yuko Maejima, Udval Sedbazar, Akihiro Ando, Hidahiru Kurita, Boldbaatar Damdindorj et all Aging (Albany NY). 2010Nov;2(11):775-84.

## PUBLIC LECTURES ON BRAIN SCIENCE

### NANSALMAA NYAMJAV

Professor, School of Sciences, Faculty of Humanities,  
Department of European Studies, National University of  
Mongolia



### EDUCATION PROFILE

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- 2012 Professor
- 2004 Associate professor
- 1997 Ph.D in linguistics. Thesis: Semantical and Lexicographical Research of Metaphors on Model “Animal - Human” in Russian and Mongolian.
- 1983 Graduated from Ural Federal University, Russian Federation. Qualified to teach in Russian language, literature and linguistics.

### AWARDS AND HONORS

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- 2015 “Best Educator and Teacher of the Year”, Faculty of Socio-Humanity, NUM
- 2010 “Best Practitioner of Science” award
- 2002 “Best Teacher of the Year” award, Faculty of Foreign Relations and Culture, NUM
- 2009 Second place in “Best Educator and Teacher of the Year” award, Faculty of Socio-Humanity, NUM
- 2004 “Best Practitioner of Education” award

## PUBLICATIONS

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**Author of 19 monographs and textbooks for university and college students. Wrote 40 research papers, 28 of which were published locally and 12 were published abroad. 60 presentations were discussed at international and local academic conferences.**

- Nandin-Erdene Osorjamaa & Nansalmaa Nyamjav “Color naming experiment in Mongolian language”//International Journal of Applied Linguistics and English Literature. Paper ID. : IJALEL 15-04-06-14. IF: 1.86 ISSN 2200-3592 (Print) ISSN 2200-3452 (Online)
- Ankhbayar Batsuuri & Nansalmaa Nyamjav “Names of toys in the early vocabulary of Mongolian children and their relation to gender”//International Journal of Applied Linguistics and English Literature. Paper ID.: IJALEL 16-05-02-42. IF: 1.86

## PUBLIC LECTURES ON BRAIN SCIENCE

### BAASANDASH CHOIJIL

Professor, Associate Dean of Research Graduate School of Business, Mongolian University of Science and Technology, Ulaanbaatar, Mongolia



### EDUCATION PROFILE

- 2004 Doctor of Engineering, Engineering Science, Tokyo Institute of Technology, Tokyo, Japan
- 2001 Master of Engineering, Mechanical Engineering Science, Tokyo Institute of Technology, Tokyo, Japan
- 1994 Master of Engineering, Mechanical Engineering School, Mongolian Technical University, Ulaanbaatar, Mongolia
- 1991 Bachelor of Mechanical Engineering, Construction and road building machinery, Mongolian Technical University, Ulaanbaatar, Mongolia

### AWARDS AND HONORS

- 2018 “Best official of Science” award, Ministry of Edu., Sci and Cult
- 2017 “Best official of Auto-transportation” award, Ministry of Edu Sci and Cult
- 2015 “Best official of Industry” award, Ministry of Industry
- 2013 “Best official of Education” award, Ministry of Road Trans Dev
- 2012 “Greenpreneur 2012” award, Mongolian National Chamber of Commerce and Industry Euro-Cansat championship. Madrid, Gold and Silver medal
- 2004 MONBUSHO Fellowship on the 21st Century, Center of Excellence Program in TIT, Japan



## PUBLICATIONS

- Sh.Liao, T.Yabe, M.S.Mohamed, C.Baasandash, Y.Sato, C.Fukushima, M.Ichikawa, M.Nakatsuka, Sh. Uchida, T.Ohkubo. “Laser induced Magnesium production using Silicon as a reducing agent towards sustainable energy cycle” *The Review of Laser Eng.*, Vol.38, No.3, 202-206 (2010)
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- Ch. Baasandash, T. Yabe, S.Uchida, Y.Sato, T. Ohkubo, T.Funatsu, M.S.Mohamed, B.Behgol, Y.Sakurai, Y.Mori “Sunlight laser and magnesium reservoir for sustainable new-energy cycle” *The Asian New and Renewable Energy Technology Symposium, ANRET 2007*, 7-9 July, Ulaanbaatar, p.76-80 (2007)
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## PUBLIC LECTURES ON BRAIN SCIENCE

### DARAMBAZAR GANTULGA

Dean, University High School, Mongolian National  
University of Medical Sciences



### EDUCATION PROFILE

- 2013 Ph.D. Dept. of Physiology, Graduate School of Medicine, Jichi Medical University, Japan. Thesis titled “Nucleobindin-2/nesfatin-1 in the hypothalamic paraventricular nucleus: regulation by metabolic factors and role in energy homeostasis”. (Mentor: Toshihiko Yada)
- 2005 M.S., Dept. of Medical Biology, School of Biomedicine, Health Sciences University, Mongolia. Thesis titled “Seroepidemiological study on Taeniasis in Mongolian adult population”. (Mentor: TemuulenDorjsuren)
- 2003 B.S., Medical Doctor and Bachelor degree, School of Medicine, Health Sciences University of Mongolia

### HONORS AND AWARDS

- 2011 Research Encouragement Award
- 2007 Research Grant for Young Scientists

## PUBLICATIONS

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- Ando A, Gantulga D, Nakata M, Maekawa F, Dezaki K, Ishibashi S, Yada T. Weaning stage hyperglycemia induces glucose-insensitivity in arcuate POMC neurons and hyperphagia in type 2 diabetic GK rats. *Neuropeptides*. 2018Apr;68:49-56.
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- Kurita H, Xu KY, Maejima Y, Nakata M, Dezaki K, Santoso P, Yang Y, Arai T, Gantulga D, Muroya S, Lefor AK, Kakei M, Watanabe E, Yada T. Arcuate Na<sup>+</sup>,K<sup>+</sup>-ATPase senses systemic energy states and regulates feeding behavior through glucose-inhibited neurons. *Am J Physiol Endocrinol Metab*. 309(4):E320-33,2015
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## PUBLIC LECTURES ON BRAIN SCIENCE

### CHOIJAMTS GOTOV

Vice President, Otoch Manramba University



### EDUCATION PROFILE

- 2010 Herbal industry GMP standard, India, Bangalor
- 2006 Recombinant technology, Dania, Copenhagen,
- 2005 Reproductive health stable drug supply, Indonesia, Jakarta
- 2004 World population development forum, Republic of China, Uhan city
- 2003 Teenagers health education, Sweden, Stock Stockholm
- 2002 Reproductive health advocacy, Thailand, Bangkok
- 2000 Health management, Singapore
- 1999 Health insurance management, Japan, Tokyo
- 1999 Reproductive health hospital service, Republic of China, Beijing
- 1998 Reproductive health planning and management, South Korea, Seoul, Family Planning Health Center
- 1998 American Education, USA, Utah Walley college
- 1997 Russian educaitional revolution, Russia, Moscow, 3rd National Medical University
- 1987 Clinical Pharmacologist, Russia, Moscow, Sechnows 1st Medical University
- 1981 Medical doctor, Ulaanbaatar, National Medical School

## PUBLICATIONS

---

- Study of anti-viral effects of *Saposhnikovia Divaricata* (Turcz) Schischk., Abstracts Fourth International Conference on Current advances in Microbiology and Immunology June p.19-21 MNUMS, Mongolian Society of Immunology and Microbiology p. 33
- Protective effects of *Saposhnikovia Divaricata* (Turcz) Schischk extract on Kanamycin-induced nephrotoxicity in rats., Mongolian Journal of Health Sciences p. 78-79
- Influence of plant *Saposhnikovia Divaricata* on the collagen-induced by inflammation of the joints in the experiment., Siberian Medical Journal Irkutsk., 2015 №1
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- Antiviral actions of *Saposhnikovia divaricata*., Onosh Journal., Ulaanbaatar Mongolia
- Some results of sequential study of *Saposhnikovia divaricata* (Turcz) Schischk in Mongolia., Health Sciences journal 1(29); 57-58
- Pharmacology study of *Saposhnikovia divaricata*., MNUMS, School of Medicine, Abstract book p. 28-30
- Study of Shingun medicinal plant used in traditional medicine., Mongolian traditional medicine journal, 2014
- Study of membrane strengthening action of Shingun-5 in an experimental model that inhibits proton flow on a 3 shaped line of first compartment membrane-redox potential with oligomycin., Journal of Pharmacy №4., 2014
- X-ray evaluation of the effects of some drugs on artificial arthritis models., Journal of Health, 2nd edition, Ulaanbaatar Mongolia p. 24-29., 2013
- Experimental study of anti-inflammatory actions of *Saposhnikovia divaricata*, a Mongolian medicinal plant, in the collagen-induced arthritis model by comparing it with standard drugs., Journal of Health, March 3, vol.9 №2 24, p. 33-38., 2013
- Study of effects of *Saposhnikovia divaricata* on the experimental model of arthritis., Journal of drug technology, innovation, usage., Mongolpharm LLC. p. 77-86., 2013
- Comparative study between anti-inflammatory and standart drug effects of *Saposhnikovia divaricata* on the experimental model of collagen-induced arthritis., Scientific Conference p.46., 2013
- Outcomes of corticosteroids in the treatment of chronic obstructive pulmonary disease., Scientific Conference 56 Journal April 4 p. 57-59., 2013
- Comparative results of systemic and local corticosteroids in the treatment of chronic obstructive pulmonary disease., INNOVATION Journal 9 months vol.7 no.3 p. 38-43., 2013
- Outcomes of treatment for chronic obstructive pulmonary disease., Mongolian Journal of Allergy, Asthma and Clinical Immunology, 6 months p. 25-28., 2013
- Study of quality of life during agitation in people with chronic obstructive pulmonary disease., Spiritual Shastins p. 116-120., 2013
- Some results of the study of nucleotide sequence of DNA particles in *Saussurea involucreta* grows in Mongolia., Khurel Togoot 2013, pp. 59-62

## PUBLIC LECTURES ON BRAIN SCIENCE

### BILEGSAIKHAN BAYARSAIKHAN

Senior Engineer, Machine Learning Team, AND Systems Tech



### EDUCATION PROFILE

- 2014 Osaka University, Japan — Bachelor
- 2012 Shine Mongol High School, Mongolia
- 2007 Toba College, Japan — Sub-Bachelor

### HONORS AND AWARDS

- 1st place Biggest Data Hackathon (Water and Mining) in Mongolia
- Scholarship from Japanese Government
- Bronze Medal from online data analysis competitions (Signate platform)
- Best Paper award from Toba College.
- Best Student award from Toba College.
- Best Project award from Sens Lab at Osaka University

### EXPERIENCE

- 2017 ANDSystems Tech, Mongolia — Senior Engineer of ML Team
- 2017 Freebit, Japan — System Developer of IoT Service

## PUBLIC LECTURES ON BRAIN SCIENCE

### GANTSETSEG TUMUR-OCHIR



Department of Mental Health, Mongolian National University of Medical Sciences

### EDUCATION PROFILE

- 2016 Achieved Ph.D
- 2002 Got Master's degree
- 2000 Completed neuro-psychiatry residential course at Medica. University.
- 1998 Got bachelor degree in medical science as a medical doctor (MD)

### WORK EXPERIENCE

- 2019 Senior teacher at Department of Mental Health, SOM, MNUMS
- 2019 Psychological doctor at Oyu Tolgoi-International SOS Clinic
- 2006 Senior teacher at Department of Mental Health, SOM, MNUMS
- 2006 Pathopsychiatry examination doctor at Mental Disorder and Narcological center
- 2006 Neuro-psychiatry teacher at Dornogobi Medical School of MNUMS

### PUBLICATIONS

- Books and handouts (cooperated works) 7
- Research articles 35, including 5 for foreign journals and 30 for national journals
- Oral presentations and abstracts 51, as 14 were presented in abroad and 38 were presented in Mongolia.
- Participated in 22 projects and 19 were research projects and 4 were other services and treatment related projects
- Co-developed and got approvals for totally 19 National Diagnostic and Treatment Standards, including 8 common disorders and 11 substance abuse disorders

# ORAL SESSION

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MULTIDISCIPLINARY  
BRAIN SCIENCE

2020



## KEYNOTE LECTURES

### MEMORY AND SYNAPSE

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Bong-Kiun Kaang, Ph.D.

Professor, Department of Neurobiology, School of Biological Sciences, Seoul National University, South Korea

Learning is the process by which we obtain the information about the world and memory is the process by which that information is stored. About 100 years ago, Richard Semon coined engram or memory trace that is defined as the lasting physical changes in the brain that occur as a result of an experience. D.O. Hebb who was searching for engram, proposed an idea of cell assembly and Hebbian synaptic plasticity, in 1949. Now it became possible to identify and label engram cells by powerful molecular biological tools and optogenetics. However, we do not know whether memory formation strengthens synapses between

engram cells in different brain regions. So, we asked if memory formation strengthens synapses between engram cells, structurally and functionally. In this talk, I will present our recent structural and functional approaches to reveal enhanced structural and functional connectivity between engram cells in the hippocampus during memory formation. Our data demonstrated that enhanced structural and functional connectivity between engram cells across two directly connected brain regions in the hippocampus forms the synaptic correlate for memory formation as was prophesied by D.O. Hebb.

## TASKS FOR PSYCHIATRISTS IN THE EARLY 21<sup>ST</sup> CENTURY

Norman Sartorius, M.D., M.A., D.P.M., Ph.D., FRC. Psych.

Professor, AIMHP, Switzerland

Professor Norman Sartorius is a former director of the World Health Organization's (WHO) Division of Mental Health, and a former president of the World Psychiatric Association and of the European Psychiatric Association. He has been described as "one of the most prominent and influential psychiatrists of his generation".

Prof. Sartorius is a Fellow of the British Royal Society of Medicine, honorary member of Medical Academies in Croatia, Mexico and Peru, and a corresponding member of the Royal Academy of Medicine of Spain and of the Croatian Academy of Arts and sciences, Honoris causa Doctor of Medicine of the Umeå University, of the Timișoara/Temisvar University Victor Babes and of the Charles University in Prague. He is also an Honorary Doctor of Science of the University of Bath in 1990. and an honorary doctor of psychology of the University of Copenhagen. He is a Distinguished Fellow of the American Psychiatric Association, an Honorary Fellow of the Royal College of Psychiatrists of the United Kingdom, and of the Royal Australian and New Zealand College of Psychiatrists. He is a Fellow or an honorary member of numerous other professional organizations.

Prof. Sartorius published more than 1400 scientific works, mostly on the epidemiology of mental disorders and social psychiatry as well as with various issues related to schizophrenia, depression, and health service delivery. Major themes in his current work and public activity are the rights of patients with mental disorders and struggle against stigma and prejudices associated with mental illness, comorbidity of mental and physical illness, and improvement of mental health services. According to the Web of Science, Sartorius' articles have been cited more than 64.000 times, and his h-index is 105. He has authored, co-authored, or edited 66 books.

His presentation will briefly describe mental health problems in the early 21st century and then suggest roles which psychiatrists should play in order to help in resolving these problems. The suggested roles will address the prevention of mental and neurological disorders, the treatment of mental disorders (and in particular the treatment of persons with comorbid physical and mental disorders) the contribution to dealing with psychosocial aspects of health and the promotion of mental health.

## PLENARY LECTURES

### WHAT ARE TRP CHANNELS ? HOW DO WE FEEL HEAT AND PAIN ?

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Tetsuya Hiramoto MD, PhD.

Department of Psychosomatic Medicine, National Hospital Organization, Fukuoka National Hospital, Japan

What will happen when you take (eat) a lot of hot pepper? You certainly will feel hot and pain in your mouth. When you take optimal amount of hot pepper you feel delicious, however, when you take abnormal amount of it, this stimulation will be harmful to you.

The brain reciprocally communicates with the peripheral organs to keep homeostasis. The brain detects stimulus information from peripheral organs and process them, then we will feel sense of hot and pain.

In this lecture, I would like to explain how we sense pain and heat, and what are TRP (transient receptor potential) channels. TRP channels are playing very important role in sensing outside and inside stimulus.

**SAFETY AND EFFICACY OF LAMINOPLASTY VERSUS LAMINECTOMY  
IN THE TREATMENT OF SPINAL CORD TUMORS: PRELIMINARY  
RESULTS OF A RANDOMIZED CONTROLLED TRIAL**

Byvaltsev V.A., Polkin R.A

Irkutsk State Medical University

**Introduction:** Laminoplasty is an alternative to traditional laminectomy and used in patients with spinal cord tumors. However, the clinical effectiveness of laminoplasty remains controversial.

**Methods:** 33 patients were randomized 1:1. 16 patients underwent microsurgical tumor resection using MISS. 17 patients underwent resection using an open technique. A modified McCormick Scale (Grades I–V) was used to assess ambulatory ability.

**Results:** The duration of surgery in both groups was comparable:  $220.1 \pm 120.3$  and  $232.5 \pm 115.1$  min for the open and MISS groups, respectively

( $p=0.35$ ). The volume of blood loss in the MISS group ( $125.3 \pm 33.2$  ml), in the open group ( $629.2 \pm 225.1$  ml),  $p=0.003$ . The number of patients who did not lose ambulatory ability or who achieved an ambulatory status of Grade I or II postoperatively was 12 (75%), Grade III–V was 4 (25%) in MISS group ( $p=0.02$ ). In the open group, the results were comparable: Grade I–II was 13 (76%) and Grade III–V was 4 (24%) ( $p=0.15$ ).

**Conclusion:** Laminoplasty can be a safer and more effective surgical method in the treatment of spinal cord tumors and is a less traumatic way to access the spinal canal.

**Keywords:** The study had no financial support.

**IBRO LECTURE**

**DEVELOPMENT OF OPTICAL IMAGING METHODS TO GO  
DEEPER, FINER AND FASTER IN LIVING BRAIN**

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Kai Wang, Ph.D.

Institute of Neuroscience, Chinese Academy of Sciences, China

Understanding the functional architecture of the brain is one of the most interesting, but also challenging tasks of our times. This challenge is largely due to the extraordinary complicated structures and functional states of the brain, and very limited access to them with our current research techniques. Recently, optical brain imaging methods have emerged as promising approaches for in vivo studies of populations of neurons in the brains with unprecedented resolution and precision, however, there still exist many technical challenges that limit their applications in brain science studies. In this talk, we will introduce several novel optical imaging methods developed in an effort to break these limits and open new windows for brain science researches.

## NEURONAL POPULATIONS PROCESSING ITCH AND PAIN STIMULI IN THE ANTERIOR CINGULATE CORTEX

Hyoung-Gon Ko, Ph.D.

Department of Biological Sciences, College of Natural Sciences, Seoul National University  
Assistant professor, Department of Anatomy and Neurobiology, School of Dentistry, Kyungpook National University, Daegu, South Korea

Pain and itch perception evoke similar aversive but qualitatively different feelings. But their transmission pathways and the brain areas processing them are intimately related to each other. The anterior cingulate cortex (ACC) has been known for its role in affective dimension of both painful and itchy sensations. However, there is no knowledge how these two somatosensory stimuli would be processed in the same brain area. In this study, we found two kinds of neuronal populations related to pain and itch processing in the layer II/III of ACC, 1) activity-dependent and 2) modality-specific activated neurons. The first neuronal population was activated by both of itch and pain stimuli given within short time interval.

But, we found that another population shows a modality-specific activation pattern regardless of time interval. Additionally, we revealed that suppressing itch- or pain-specific neurons using GiDREADD solely reduced pruriception or nociception, respectively. Taken together, these results showed there are two distinct neuronal populations processing itch and pain information in the ACC. The first population is activated by both of pain and itch stimuli based on time interval given two stimuli rather than modality. Second population is specifically involved in the processing of one of pain or itch stimulus based on modality, regardless of time interval.

## IBRO LECTURE

**INTERACTION BETWEEN MTORC2 AND PKC EPSILON IN ALCOHOL USE DISORDER**

Jaya Kumar, Ph.D.

Department of Physiology, Faculty of Medicine, Universiti Kebangsaan, Malaysia

PKC epsilon (PKC $\epsilon$ ) was shown to regulate various behavioral changes related to alcohol use disorder (AUD) through phosphorylation of their substrates. We have previously targeted the upstream receptor functionally linked to PKC $\epsilon$ , such as mglu5 receptors, to inhibit the activities of the kinase through systemic antagonism of the receptors, which successfully attenuated alcohol withdrawal (AW)-induced anxiety in rats. In order for PKC $\epsilon$  to be fully functional, the protein kinase needs to be fully phosphorylated and activated by diacylglycerol. Existing literature suggests that phosphorylation of PKC $\epsilon$  is initiated by PDK-1 at its active loop and followed by autophosphorylation at turn and hydrophobic motifs. Whereas, more recent findings have implicated an upstream kinase mTORC2 in phosphorylation of PKC $\epsilon$  at its turn and hydrophobic motifs independent of the

PDK-1 activity in cardiac myocytes. In vitro studies have shown PKC $\epsilon$  to interact with mTORC2 through mSIN1 (a subunit attached to mTOR core protein). mTORC2 in the dorsomedial striatum regulates excessive alcohol intake. At present, the nature of interaction between mTORC2 and PKC $\epsilon$  in AUD is poorly understood. Hence, we investigated the changes in gene and protein expressions of PKC $\epsilon$ , phosphorylated PKC $\epsilon$ , and subunits of mTORC2 such as mTOR, and Sin1 during various stages of AUD such as acute, chronic, AW and AW + alcohol (mimics relapse). We also performed co-precipitation of mTOR with Sin1, total PKC $\epsilon$ , and phosphorylated PKC $\epsilon$  to understand the nature of interaction of mTORC2 between PKC $\epsilon$  in the amygdala, the brain region that regulates negative reinforcement of alcohol.

## NEUROPSYCHOPHARMACOTHERAPEUTIC INTERVENTIONS FOR TARGETING GUT-BRAIN DYSBIOSIS IN AUTISM SPECTRUM DISORDERS

Ranjana Bhandari, Ph.D.

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Autism Spectrum Disorders (ASD) include complex neurodevelopmental disorders associated with characteristic symptoms manifesting in children. Many physiological co-morbidities are associated with ASD such as immune system deregulation, neuroinflammation, oxidative stress, mitochondrial dysfunction and gastrointestinal complications. The prevalence of gastrointestinal complications in ASD range from 9%-70% and these correlate with behaviors consistent with autistic endophenotype indicating that these are one of the major co-morbidities associated with ASD. Significant increase in *Clostridium bolteae* and *Clostridium* clusters I and XI *Desulfovibrio* spp. as well as *Sutterella* and *Ruminococcus* spp. in individuals with ASD compared to control. It has been observed that these gut bacteria produce short chain fatty acids (SCFAs) such as PPA as a result of breakdown of dietary carbohydrates and amino acids. Gut-brain dysbiosis occurs as propanoic acid (PPA), is capable of causing alterations in the levels of neurotransmitters such as serotonin, dopamine and glutamate via stimulation of calcium release. It disrupts the excitatory: inhibitory balance of glutamate: GABAergic transmission which is similar to that observed in autism. It releases inflammatory cytokines like TNF- $\alpha$ , IL-6, INF- $\gamma$  and depletes endogenous antioxidants like glutathione, superoxide dismutase as well as elevates lipid peroxidase leading to increased oxidative stress. In order to tackle immune system dysregulation and generation of reactive oxygen species (ROS) which lead to synthesis of various pro-inflammatory cytokines and chemokines causing activation of microglia,

dietary phytochemicals were thought to be a safer and useful alternative as an adjunct neurotherapeutic moiety. Naringenin, a dietary flavanoid, was selected as an adjunct neurotherapeutic for ASD. It has low oral bioavailability and blood brain barrier (BBB) is another limitation which prevents its penetration due to presence of several ABC efflux transporters such as P-gp limiting its uptake. Naringenin loaded polymeric nanocarriers were prepared using Poly(D,L-lactide-co-glycolide) and were surface coated with reduced glutathione and Tween 80 for targeted and enhanced brain delivery, as these ligands can inhibit P-gp. These formulations were evaluated in rats which showed autism like endophenotype after intracerebroventricular administration of Propanoic acid, a by-product of abnormal gut-flora in children afflicted with ASD and worsens their complications. Pharmacokinetic studies were carried out and pharmacokinetic-pharmacodynamic model was developed for behaviours associated with ASD after administration of naringenin loaded nanocarriers and unencapsulated naringenin. We have also evaluated the neuropsychopharmacotherapeutic effects of curcumin and resveratrol in the rat model of ASD. The study confirms neuropsychopharmacotherapeutic potential of naringenin, curcumin and resveratrol and enhanced brain targeting potential of surface engineered naringenin loaded nanocarriers in attenuating the neuroinflammatory cascade and oxidative stress, a key pathogenic mechanism responsible for behavioural, biochemical as well as mitochondrial dysfunction associated with ASD, enabling their use as an adjunct neurotherapeutic in ASD.



**IBRO LECTURE**

**CIRCUS BASED MINDFULNESS AS GAMIFICATION OF  
PSYCHOLOGICAL INTERVENTION FOR LOWER AND MIDDLE  
INCOME COUNTRIES**

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Mindfulness based interventions have accrued increasing efficacy in depression and anxiety, especially in young people and adolescents for whom pharmacotherapy is discouraged. Depression and anxiety in adolescents is strongly related to various psychosocial determinants, including a lack of connecteness and isolation, psychological inflexibility and less openness to experience. Circus-based mindfulness interventions are proposed that would fulfil three purposes. It would deliver a circus based physical exercise-focused intervention, promoting wellness and strengthening primary prevention of depressive and anxiety disorders. It would also allow mindfulness exercises with high levels of evidence to be taught in a fun way through gamification and flipped learning. Lastly, it would improve community wellbeing and sense of belonging via shared creation of an innovative and interesting circus based mindfulness intervention. Four circus-based skills: juggling, stilt walking,

unicycling, and tightrope walking, were integrated with core mindfulness skills. Throughout pilot development, qualitative feedback of teachers and students were incorporated in terms of measures of self-confidence, social skills, communication skills, and attention. Multiple iterations of module development in the same secondary school, with different year groups, yielded a comprehensive half-day integrated circus-mindfulness programme that was symbiotic rather than piecemeal, and was able to address the targeted values of connectedness, self-confidence, social skills, and also target the underlying psychopathologies of depression and anxiety. In conclusion, participatory action research is an egalitarian and effective method of producing a novel circus-based mindfulness module in adolescent mental health. It can be used in lower and middle-income countries as an effective public health intervention.

## BRAIN SCIENCE – THE FRONTIER SCIENCE IN 21<sup>ST</sup> CENTURY

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Although neuroscience has developed relatively late compared to other basic sciences, it has been declared worldwide as the frontier science of the 21st century. Because we are introducing modern technology to our country, protecting the health of the population, improving the education of specialists, developing research-based government policies, recording and studying any factors that affect national security, and accelerating industrialization need to use common sense.

Since the establishment of the Mongolian Neuroscience Society in 2014, there were some needs for an official and professional organization to develop the Brain Science in Mongolia. In 2018, under the auspices of the President of Mongolia many world-renowned scholars, including Nobel Prize Laureate Edvard Moser, Pierre Magistretti, The President of International Brain Research Organization, Juan Lerma, Editor-in-Chief of Neuroscience came together to discuss neuroscience and it's developing in Mongolia. As a result of this international conference, on April 24, 2019, the “Brain Science Institute” (BSI) was established at the Mongolian University of Medical Sciences (MNUMS). BSI has two main proposes which are studying Basic and Clinical Research and Training.

The Brain Science Institute is constantly working to introduce and localize diagnostic and treatment with technologies in Mongolia using modern precision instrumental analysis methods, the prevalence of neurological and mental diseases in Mongolia, and the factors influencing them. Consequently, we are pleased to announce the launch of a full-fledged clinical center for the diagnosis of stress and sleep disorders at the BSI in the fall. In addition to hosting an annual international neuroscience conference, we are organizing the IBRO – APMC Associate School. A 6-day school, named as “Basic Neuroscience Techniques 2020”, is designed for 20 graduate students in brain science from the countries of the Asian-Pacific region.

The next direction of the Brain Science Institute is to improve its human resources and technical capacity, and to study addictive disorders and depression. To accomplish our goal, we are cooperating with International Institutes and Universities by training our young researchers abroad. We are confident that this international conference will contribute to the development of neuroscience in Mongolia.

## NEUROSCIENCE

## VALIDATION AND PSYCHOMETRIC PROPERTIES OF THE MONGOLIAN VERSION OF THE TOUCH EXPERIENCES AND ATTITUDES QUESTIONNAIRE

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**Introduction:** The main objective of the study was to adapt and validate the TEAQ questionnaire for a Mongolian sample. At the same time, the opinion of the authors of the English-language questionnaire, as well as the authors of the Russian-language version of this questionnaire, was taken into account that it is necessary not only to adapt the existing version of the questionnaire, but to create a parallel Mongolian-language version based on the original battery of 117 items, which was used to create the original version of the questionnaire. The object of the research is the TEAQ questionnaire for the study of tactile contact and psychometric characteristics of the Mongolian version of the TEAQ questionnaire. The empirical hypothesis assumes that the factor structure of the Mongolian version will generally correspond to the structures of the British and Russian versions, since the attitude towards tactile contact is not only culturally, but also biologically determined.

**Methods & Results:** Comparative theoretical and analytical analysis of psychological works; interview; for quantitative analysis, the methods of mathematical statistics were used: calculation of reliability based on the internal consistency of  $\alpha$ -Cronbach, analysis of questionnaire items using the Likert method, factor analysis. The analysis of the results was carried out using the IBM SPSS 24 and Microsoft Office Excel 2010 programs.

Sample and empirical base of the study: The study involved 166 respondents. The age of the

participants ranged from 18 to 63 years. Theoretical significance of the study: this work will reflect the specifics of tactile contacts among representatives of Mongolia,

**Conclusion:** The need to study the characteristics of tactile contacts led researchers to the need to create questionnaire techniques for their study. One of these techniques is the questionnaire proposed by F. McGlone and colleagues. This questionnaire is aimed at studying the attitude to touch in all periods of life, and was first developed in England, then adapted for the Russian-speaking sample. In this study, the above-mentioned questionnaire was adapted for the Mongolian-speaking sample. It was shown that the original text of the questionnaire (117 items) has low reliability, however, after deleting items with low correlation and items to which the respondents refused to answer due to the inadmissibility of such items for Mongolian culture, the modified version of the questionnaire (87 items) showed satisfactory psychometric indicators.

The factorial structure of the questionnaire generally corresponds to the factor structures of the English and Russian versions of the questionnaire, with the exception of the factor associated with social tactile contacts, which, in our opinion, reflects the cultural specificity of the Mongolian people. Thus, the hypothesis of our research has found partial confirmation, the research objectives have been completed, the goal has been achieved.

## EFFECT OF DAY TIME NAP ON VISUAL DISCRIMINATION TASKS

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**Introduction:** Person's health, thinking ability, academic performance, and concentration depend on the sleep. Poor sleep quality not only impairs mental ability, but also makes you drowsy while driving and increases the risk of accidents. Eighty percent of 16- to 24-year-old drivers fall asleep while driving, which is one of the first signs of sleep deprivation. A day time nap during the day has a positive effect on concentration and thinking, and the optimal duration of dizziness is 30 minutes or less. If sleep continue more than 30 minutes it will be move into deep stage of sleep and difficult to refresh to wake up. Many of universities and colleges of the world have nap room. The lack of research on the intellectual capacity of participants in relation to sleep patterns in Mongolia is the background of this study.

**Method:** The Pittsburgh Sleep Quality Index was used to assess participants' sleep quality. The test consists of 9 questions with 7 sections on self-assessment, and based on the last month's sleep patterns, and reveals sleep disorders and general sleep quality. The Pittsburgh Sleep Quality Index ranges from 0 to 21, and the higher score shows the sleep quality and sleep problems. The survey was completed by 450 participants. By this test, sleep quality express by scores and scores are high means poor sleep quality or sleep disorder.

A short study during the day has a positive effect, so a room has been set up for the participants. Four beds were placed in a nap room, blindfolds were placed, soft music was played, and participants were placed in a nap room for 30 minutes. If someone sleep for more than 30 minutes, he or she will move into a deeper stage of sleep, during which the head will become more difficult to wake up and fall asleep instead of waking up.

Eighty-eight of the participants in the nap room were given a chart to check their speed of attention before and after a 30-minute nap, and a short-term memory test for Visual Discrimination Tasks.

The survey was conducted using descriptive research methods, including a Schultz table, a memory test, and a Pittsburgh sleep quality index and using SPSS 25.0 software.

**Result:** A total of 450 participants involved in the Pittsburgh Sleep Quality Index, including 102 male and 348 female. The average index of respondents was 10.42 by this study. Also, 259 of those surveyed slept less than 7 hours a day and lacked sleep. According to the Pittsburgh Sleep Quality Index, a score of less than 5 indicates a healthy sleep pattern, with 35 (7.78%) of the 450 participants surveyed having a healthy sleep pattern, while the remaining 415 participants, or 92.2%, need to change their sleep patterns in some way. Total 88 participants were served by nap room, 76.1% were male and 23.9% were female. For male participants, the average speed was increased by  $34.03 \pm 7.5$  seconds before bedtime and  $30.97 \pm 8.1$  seconds to movement of concentration after 30 minutes of sleep. The short-term memory test was completed in  $51.93 \pm 5.8$  seconds, followed by  $42.89 \pm 6.2$  seconds in the bedroom. Female participants completed to fill out the Schultz table in  $36.04 \pm 5.9$  seconds and  $30.53 \pm 8.4$  seconds after 30 minutes of short sleep. The short-term memory test was completed in  $49.4 \pm 5.5$  seconds, followed by  $41.4 \pm 4.2$  seconds after the temporary sleep.

**Conclusion:**

1. According to the survey results, there is poor sleep quality and lack of information of proper sleep habits among the participants.
2. Day time nap had a positive effect on the activity of higher nervous system.

## NEUROLOGY &amp; NEUROIMAGING

## COLOUR DOPPLER ULTRASONOGRAPHIC CHARACTERISTICS OF CAROTID ARTERY AMONG MONGOLIANS: IN A POPULATION-BASED SCREENING STUDY

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**Introduction:** In Mongolia, incidence of stroke continues to be major health concerns because of rapidly increasing rates of cerebrovascular angiopathy related conditions such as hypertension, diabetes, dyslipidemia and obesity. To date, no studies have investigated whether cerebrovascular ultrasound examination becomes more important or whether it becomes less important in the risk assessment of cerebrovascular diseases among Mongolian general population. This study aims to examine carotid artery characteristics in comparison of people with and without diabetes in order to evaluate the diagnostic importance of the carotid artery examination in the general population.

**Methods:** In this study, using data from the population-based Timeline study (N=79). The Timeline is a prospective population-based cohort study and the full cohort is currently ongoing. In addition to the sample, 46 people with diabetes were included from AGINGD-Mon study (n=46). In accordance with AHA/ASA guideline recommendations for prevention of stroke, Common and internal carotid artery characteristics were evaluated by Color Doppler Ultrasound Scanner (Model, PT5200, Perlong Medical Equipment Co., Ltd., China) using a linear probe of 7.5MHz. The characteristics included intima-media thickness (IMT) of internal carotid artery (ICA) and common carotid artery (CCA). Exclusion criteria were younger than 45

years. All statistical analyses were performed using IBM SPSS V.27.0. Comparisons between the study groups were conducted by Student *t*-tests using age-and-sex matched sample of people with and without diabetes. Pearson correlation coefficient was calculated. The level of statistical significance was set at  $p < 0.05$ .

**Results:** The mean CCA-IMT values of the non-diabetic subjects was  $0.66 \pm 0.21$  mm. When compared to diabetic subjects, IMT ( $1.01 \pm 0.77$  mm) was significantly higher than those of the non-diabetic subjects ( $p < 0.05$ ). Resting ultrasonographic characteristics were significantly different in diabetic group. Intima-media thickness of ICA and CCA were increased with age ( $r=0.196$  and  $r=0.285$ ,  $p < 0.05$ ). The strong positive correlations of IMT with age observed in both groups of diabetic and non-diabetic subjects. Among all age groups (45-60 and  $>60$ ), the diabetic subjects had higher values than the non-diabetic subjects.

**Discussion and conclusion:** The study shows that age seems to be an important factor in the development of cerebrovascular angiopathy. Therefore, a non-invasive and accessible diagnostic tool such as cerebrovascular ultrasound should be recommended all people aged 45 years or older.

**Keywords:** Stroke, intima-media thickness, plaque, Timeline study

## ISOLATED ABSENCE OF F-WAVE IN PATIENTS WITH GUILLAIN BARRE SYNDROME

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**Introduction:** The electrophysiological findings are the important parameters as a diagnostic tool in Guillain Barre Syndrome (GBS), especially F-waves abnormalities are important criteria including prolonged or isolated absence of F-waves. Moreover, the F-waves are a clinically important prognostic factor in GBS. The association between F-waves and clinical presentation among Mongolian has not been investigated. This study aims to examine F-waves in patients with GBS in different clinical presentations such as age, sex, vintage of electroneurographic (ENG) examination and muscle weakness.

**Methods:** In this retrospective study, 75 patients' medical records were reviewed. The data collected from 2016 to 2019 at the Reflex Neurological Clinic Mongolia. F-waves were recorded according to standard techniques using surface electrodes in upper and lower extremities. Nerves are included N.Medianus, N.Ulnaris, N.Peroneus, and N.Tibialis. All statistical analyses were performed using STATA. The level of statistical significance was set at  $p < 0.05$ .

**Results:** There was no significant difference between right and left sides of the F-waves records ( $p > 0.05$ ). Using data of F-waves at right sides, 40

(53.3%), 44 (58.6%), 50 (66.6%) and 46 (61.3%) had isolated absence of F-waves at N.Medianus, N.Ulnaris, N.Peroneus, and N.Tibialis among total 75 patients, respectively. This shows that isolated absence of F-waves was more occurred in lower extremities. Moreover, lower extremities had more frequently prolonged F-waves. Furthermore, in clinical presentations of GBS, we found no association between F-waves and age, sex, vintage of ENG examination and muscle weakness.

**Conclusion:** In the literature, studies found that different results of the isolated absence of F-waves. Our study shows that more frequently isolated absence of F-waves in patients with GBS. This reveals that needs for further investigations, especially the association between F-waves and the electrophysiological types of GBS such as acute motor axonal neuropathy and acute inflammatory demyelinating polyneuropathy.

**Keywords:** Guillain Barre Syndrome, F-waves, electrophysiological examination

## PSYCHIATRY &amp; SOCIAL PSYCHOLOGY

THE INFLUENCE OF WATCHING TV ON CHILDREN  
MINDS AND BEHAVIOUR

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**Introduction:** Factors that sculpture children's way of thinking are found mostly in the environment where they grow up. These include daily events, memorable experiences and peak feelings. Cartoons are one of the daily habits for our children; studies have proven that an average child with a facility of a TV and a satellite connection at his home watches approximately 18,000 hours of television from kindergarten to high school graduation (Khaled Habib, Tarek Soliman 2015). Children are considerably and easily influenced by what they see in television shows and cartoon movies, and they exhibit most of the behavior they watch in their plays. According to a study, television plays a more important role for 2-5 years old children and they watch cartoon movies 32 hours a week (Bushman, 2015) while a Mongolian child spends 3 hours and 16 seconds watching cartoon movies in front of the television a day. (Survey, 2018). The purpose of this survey is to define how television shows and cartoons affect children mind and behavior

**Methods:** The used methodology is document analysis, observation and interview.

- How does this experience affect our children minds and behavior? Does it have positive or negative effects?
- What types of contents are delivered to our kids in a cartoonish show and the percentage of external and domestic contents?
- What the result of the comparison study year by year how many hours preschoolers and primary school children spend watching television?

These questions and others will be answered through this survey-experimental research. The

survey is based on the information reviewing registry database and television viewing reports made by Maxima Consulting LLC in 2016, 2017, 2018 and 2019.

**Results:** From July 2016 to June 2017, children's content accounted for 6.2 percent of all broadcasts, while from July 2018 to June 2019, this percentage increased to 6.9 percent. The share of foreign cartoon series is increasing year by year, reaching 44.16% in 2016, 54.60% in 2017, and 59.01% in 2019. There are some advantages for children walking in line with world standards, learning a foreign language, and gaining an understanding of human relations. On the other hand, it can have a negative impact on forsaking Mongolian customs, heritage, and pride in country history, adoring and imitating foreigners. During the observation and discussion with children, they do what the heroes do, act and try to talk like them.

**Conclusion:** A detailed look at Mongolian television programs for children demonstrates that the content was not sufficient for the child's upbringing, behavior and formation of their mind. There is a lack of television programs that regard Mongolian language as superior, respect the country and be proud of it during the qualitative change in human development stabilization (Tuya, 2018). There has also been an increase in the use of foreign words in children's speech, as well as the use of non-verbal gestures and facial expressions to imitate cartoon characters. We have included it in a detailed case. What is more, children prefer to watch cartoon movies to doing an outside activity because children's parents are busy with their works in our society nowadays. Therefore, families should encourage them to socialize.

FRAME OF REFERENCE FOR TEENAGE LIFE AND VALUES

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**Introduction:** Every decade has its own specific cultural and political characteristics which directly influence the lifestyle and the system of values of the young generation. The article aimed to reveal what the live references of Mongolian teenagers, what their value and aspirations and how they are interrelated, what their choosing orientation from the drastically different and contradictory values in life? There two assumptions are conceptualized.

**Methods:** The study looked at “teenagers” (10-19 years old) as defined by the World Health Organization (WHO) and sought to highlight common values and lifestyle differences among teenagers. 142 children aged 10-19 from Bayanzurkh district of the capital city were involved in the survey. In order to determine whether the assumptions are proved, teenager’s frame of preference is defined by Schwartz’s methodology and compared with lifestyle (defined by Lazer, 1963, AIO model). The results of the study were processed by IBM SPSS20.

**Results:** Teenagers’ values depend largely on their lifestyle, family, social and unique characteristics, traditional customs and heritage. Teenager’s values are varied according to their age, gender, and standard of living. Research has shown that values have a direct impact on their lifestyles, and that traditional customs and heritage are becoming not important to them. The novelty of this study is the comparison and interdependence correlation between the values and lifestyles.

**Conclusion:** New methods and techniques aimed at respecting the core rights and interests of teenagers, respecting the uniqueness and diversity of each child, and developing children’s physical, mental, social, life skills, and independence engagement in social participation and intercommunity cooperation. The youth from the twentieth century prioritized the following values: a successful and happy family life, reciprocal love relationships, friendship, acceptance, kindness and respect of others. The young generation accepted the inner value of a human person, the value of an individual, and expressed the will to belong to small social groups.



## PSYCHIATRY &amp; SOCIAL PSYCHOLOGY

SOME RESULTS OF OCCUPATIONAL MINDFULNESS PROGRAMME  
AT HEALTH ORGANIZATIONS IN MONGOLIA

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**Introduction:** Globally, in 2018, the health care workers were counted for 43 million and expected to reach 82 million by 2030, but then again, the current lack of the workforce is estimated at 14 million. One of the conditions for the development of health care is the human resources in the health sector, and there is still a general shortage of medical professionals, including nurses and midwives, not only in Mongolia but also internationally.

The one third or 33% of the Mongolian health workers are nurses and midwives. In 2018, the total population of Mongolia was estimated at 3.238.479 and the 4343 health care organizations in which a total of 11.169 doctors and 12.344 nurses. It means that there were 38.6 nurses per 10,000 populations, which is lower than the world average. Furthermore this is one of the factors affecting the workplace stress for nurses. Nurses' workplaces are stressful, and they are exposed to the effects of stress in their daily environment.

Chronic stress at work leads to fatigue syndrome, inability to work, which is manifested by emotional exhaustion, followed by an emotional numbness or a negative attitude towards oneself and others. The work-related stress cannot be eliminated forever, thus the effective coping techniques can help reduce the possible harmful consequences.

In recent years, due to a variety of factors, including the drastic changes in social and economic lives - in science, technology, information, urbanization, or overcrowding - there have been a number of stress scenes, such as emotional instability, discomfort, and anxiety. Nurses are the people who have the closest contact with the population, thus we urged the need to study the stressors in their working environment.

**Methods:** This trial study involved the nurses from the Mongolian specialized tertiary-level four hospitals. The nurse work stress levels were assessed by a cross-sectional model of analytical research method.

Meanwhile, the stress reducing effect of mindfulness was determined employing the intervention model of the trial study method. The study data were processed by SPSS 23.0.

**Results:** The study involved totally 473 nurses from the tertiary referral hospitals of Mongolia - National Center for Traumatology and Orthopedics (121), National Center for Mental Health (89), National Center for Infectious Diseases (146), and National Cancer Center (117). We compared the WPS questionnaire stress levels regarding the salivary alpha amylase test (considering the stress level as 100%) and it revealed that the low level of stress is 7,6%, average/medium stress level - 27,1%, and the high stress level was estimated at 63,3%. We considered WSP indices comparing the pre (150,059) and post (139,02) status of mindfulness interventions. The difference was 7.3% - mindfulness reduced the work stress.

In accordance with the sAA indices the nurses stress levels of the mindfulness group, stress-management group and low-level stress group were reduced by 3.03, 1.44, and 0.87, respectively. The control group expressed 0.26 KU/L of reduction. The average indices of nurse sAA before ( $F=10.936$ ,  $p=0.000$ ) and after ( $F=8.443$ ,  $p=0.000$ ) the training were analyzed by ANOVA and we found statistically significant real differences.

**Conclusion::**

- (1) Nurse occupational stress urges regarding their age, gender, work area and experiences.
- (2) In the scale of nurse occupational stress some physiological factors such as hypertension, blood glucose levels, salivary alpha amylase have not certain relations with each other.
- (3) The WPS questionnaire and sAA stress levels were different.
- (4) Mindfulness reduces the nurse occupational stress level regardless of age, gender, education and work experiences.

THE RESULT OF INVESTIGATING THE MOTIVE FOR TABACCO  
SMOKING AMONG WORKING ADULTS IN MONGOLIA

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**Introduction:** Tobacco smoking is one of the world's largest health problems for many decades. During the 20th century, it is estimated that around 100 million people died prematurely because of tobacco smoking, mostly in developed countries. The health burden of smoking is now shifting from high-income to low-to-middle income countries. Some estimates have suggested that one billion people could die from tobacco related illnesses in the 21st century. According to the Global Burden of Disease study, more than 8 million people died prematurely worldwide as a result of cigarette smoking in 2017. It has been estimated that 80% of adult smokers begin to experiment with smoking during childhood and about 30% of children have tried smoking by the age of 11. No single reason could be isolated as to why people begin to smoke.

**Methods:** Seven hundred and eleven(711) volunteers were included to study their reason for smoking. The Fagerstrom test- widely used internationally, includes six (6) questions to measure nicotine dependency and "The Why Do I Smoke Test" includes eighteen (18) questions to determine the reason of smoking were used in the study. The statistical processing was analyzed by SPSS Statistics program (version 21).

**Results:** Seven hundred and eleven (711) participants, 690 (97%) men and 21 (3%) woman, participated in the study. The average age of the participants were  $34.8 \pm 8.1$ . The nicotine dependence level of participants were 48.7% (n=348) for moderate dependency, 25.7% (n=183) for low to moderate dependency,

17.3% (n=123) had high dependency and 8.3% (n=59) had low dependency. Regarding the reason for smoking the study found that 72.6% (n=516) smoke cigarette to relieve their stress and 58.2% (n=414) use smoking to inhibit their nicotine withdrawal symptoms. Also 57.7% (n=410) smoke to be satisfied, 38.3% (n=272) smoke to refresh their mind when they are exhausted, 31.8% (n=226) smoke to make the time pass or for enjoyment and 26.3% (n=187) smoke because it has become a habit. In comparison between nicotine dependency and the reasons participants smoke, it was found that 78% of 348 people who had moderate dependency, 89.4% of 123 people who had high dependency and 60.7% of 183 people who have low dependency were likely to smoke to relieve stress which was statistically significant ( $p < 0.000$ ).

**Conclusion:** The majority of participants use smoke to relieve stress, to be satisfied or to inhibit their nicotine withdrawal symptoms.

**Keywords:** Stress, addiction, refresh, satisfactor, enjoyment.

**INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE**

**EMERGING MECHANISMS LINKING COVID-19 TO ANOSMIA**

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Altered olfactory function is a common symptom of COVID-19, but its etiology is unknown. A key question is whether SARS-CoV-2 (CoV-2) – the causal agent in COVID-19 – affects olfaction directly, by infecting olfactory sensory neurons or their targets in the olfactory bulb, or indirectly, through perturbation of supporting cells. Here we identify cell types in the olfactory epithelium and olfactory bulb that express SARS-CoV-2 cell entry molecules. Bulk sequencing demonstrated that mouse, non-human primate and human olfactory

mucosa expresses two key genes involved in CoV-2 entry, ACE2 and TMPRSS2. However, single cell sequencing revealed that ACE2 is expressed in support cells, stem cells, and perivascular cells, rather than in neurons. Immunostaining confirmed these results, and revealed pervasive expression of ACE2 protein in dorsally-located olfactory epithelial sustentacular cells and olfactory bulb pericytes in the mouse. These findings suggest that CoV-2 infection of non-neuronal cell.

## INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

### SEEING INTO THE ORGANIZATION OF THE SYNAPSE

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The structure of the nervous system varies tremendously across phylogeny; organisms such as the *C. elegans* function with a few hundred neurons, whereas humans have tens of billions. Yet communication in all neural circuits is controlled by a remarkably similar, highly specialized site of cell-cell contact known as a synapse. The long-range goal of my research is to discover how synapses are formed and lost, and what impact

normal morphology and numbers of synapses have on brain function. My talk will focus on our recent work using super-resolution imaging to visualize the nanoscale organization of synapses and the impact of plasticity. Determining how synapses develop and mature will provide insights toward the understanding of neuronal networks and brain function.

**INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE**

**POST-TRANSLATIONAL PALMITOYLATION IN THE REGULATION OF  
SYNAPTIC PLASTICITY**

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Canada

Palmitoylation is the most common post-translational lipid modification in the brain. It involves the addition of the fatty acid, palmitate, onto substrate proteins and is exceedingly important for protein trafficking and cell signaling. Enzymes that mediate palmitoylation consist of a family of 23 proteins DHHC enzymes. Approximately 41% of all identified synaptic proteins are substrates for palmitoylation, and the differential palmitoylation of synaptic substrates has been reported in response to synaptic activity

suggesting a role for palmitoylation in the regulation of synapse plasticity. Using proteomic analysis, we have identified a list of synaptic proteins that are differentially palmitoylated in the hippocampus of mice that have undergone fear conditioning, as well as in hippocampal cultures following chemical LTP. We have also identified DHHC enzymes that are differentially expressed and modified in response to synaptic activity, to provide a more mechanistic understanding of how DHHC enzymes regulate synapse plasticity.

## INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

### CELLULAR-RESOLUTION GENE EXPRESSION PROFILING IN THE NEONATE MARMOSSET BRAIN

Tomomi Shimogori, Ph.D.

Lab for Molecular Mechanisms of Brain Development, Center for Brain Science, RIKEN, Saitama, Japan

Precise spatiotemporal control of gene expression in the developing brain is critical for normal neural circuit formation, and comprehensive mapping of gene expression in the developing primate brain is therefore crucial to understand brain functions and dysfunction. Here, we report an unbiased and automated *in situ* hybridization (ISH)-based large-scale cellular-resolution gene expression profiling system (GePS) and companion analysis, revealing unique gene expression patterns in the neonate New World marmoset cortex, thalamus and striatum, as compared to mouse. Gene ontology search

revealed enrichment of genes associated with catalytic activity in visual cortex and neuropsychiatric disorders in thalamus for marmoset specific genes. Moreover, genes that have expression in cortex with clear area boundaries, revealed by GePS, were applied to a novel 3D cortical surface mapping algorithm to delineate higher order cortical areas, which was not evident on 2D slice ISH data. GePS therefore provides a powerful platform to elucidate molecular mechanisms underlying primate neurobiology and developmental psychiatric and neurological disorders.

**INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE**

**PLANAR CELL POLARITY SIGNALING IN GLUTAMATERGIC SYNAPSE  
FORMATION AND MAINTENANCE**

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Yimin Zou, Ph.D.

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Directional and positional information is essential for the diverse neuronal morphology and connectivity during development. The direction of axon growth helps build the correct networks among neurons sometimes from far away. Neuronal synapses are asymmetric cell-cell junctions with distinct pre- and postsynaptic structures to convey neural activity in a directional fashion. Recent studies show that some of the key asymmetry is mediated by highly conserved cell polarity signaling pathways. These

pathways, planar cell polarity (PCP) and apical-basal polarity, are not required for the global axon-dendrite polarity. Therefore, the apparent distinct types of morphological asymmetry in the nervous system, growth cone turning and synaptic junctions, are mediated by similar cell polarity signaling mechanisms widely used in cellular and tissue morphogenesis. I will present new findings on the role of PCP signaling in regulating synapse maintenance in mature neural circuits.

## INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

### DECONSTRUCTING NEURAL STEM CELL TRAJECTORIES AT SINGLE CELL RESOLUTION

John J. Ngai, Ph.D.

Director, NIH BRAIN Initiative, National Institute of Neurological Disorder and Stroke, National Institutes of Health, Bethesda, USA

The generation of neuronal diversity in the nervous system requires the specification and differentiation of a multitude of cellular lineages. The regulatory programs governing the differentiation of mature neurons from their progenitors remain incompletely characterized, however, in part because of the difficulty in studying neuronal progenitor cells in their native environments. In the vertebrate olfactory system, primary sensory neurons are continuously regenerated throughout adult life via the proliferation and differentiation of multipotent neural stem cells. Upon severe injury, these adult

tissue stem cells are activated and go on to reconstitute all of the cellular constituents of this sensory epithelium. The regenerative capacity of the olfactory epithelium therefore presents a powerful and experimentally accessible paradigm for elucidating the mechanisms regulating neural stem cell function. I will present recent studies employing single cell transcriptomic and epigenomic analyses that give insights into the genetic and epigenetic programs that both define and regulate olfactory neurogenesis during regeneration.



INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

**ROLE OF DIVERGENT PROJECTION NEURONS OF THE INSULAR CORTEX IN ANXIETY- AND VALENCE-RELATED BEHAVIORS**

Anna Beyeler, Ph.D

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Most pharmacological treatments of anxiety disorders are targeting the serotonin system. Although the insular cortex (IC) has been described to be overactive in patients with anxiety disorders, the implication of specific neural populations and serotonin receptors located within this region, in the control of anxiety remains unknown. Using viral anterograde tracing we found that the anterior and posterior insula neurons, preferentially project to the basolateral (BLA) and central amygdala (CeA) respectively. Optogenetically assisted circuit mapping allowed us to demonstrate a monosynaptic connection of the insula neurons to BLA glutamatergic neurons and CeA GABAergic neurons. We identified that 80% of IC-BLA and IC-CeA

projectors express the serotonin 1A or 2A receptors, while only 30% of GABAergic interneurons express these receptors. Using fiber photometry, we found that projection neurons of the anterior, but not posterior insula are more active in anxiogenic spaces. Interestingly, recordings of IC BLA neurons revealed that the IC-BLA populations is also more active in pro-anxiety environments. Interestingly, IC neurons projecting to the lateral hypothalamus (IC-LH) present an opposing activity, as they are inhibited in anxiogenic spaces, and this specifically when a reward is placed in those spaces. Altogether, our findings revealed a new role of the anterior insular cortex and IC BLA projection neurons in anxiety-related behaviors.

## INTERNATIONAL SYMPOSIUM ON FRONTIERS OF NEUROSCIENCE

### SINGLE CELL ANALYSIS IN THE BRAIN AND WHY IT MATTERS FOR DISEASE

Jens Hjerling Leffler, Ph.D.

Department of Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden

Genome-wide association studies (GWAS) have discovered hundreds of loci associated with complex brain disorders, and provide the best current insights into the etiology of these idiopathic traits. However, it remains unclear in which cell types these variants may be active, which is essential for understanding disease etiology and for disease modelling. Here we integrate GWAS results with single-cell transcriptomic data from the mouse and human nervous system to systematically identify cell types underlying schizophrenia and neurological conditions as well as other brain complex traits. We show that psychiatric disorders are predominantly associated with excitatory neurons from the cortex/

hippocampus, medium spiny neurons from the striatum, diverse sets of midbrain neurons, and inhibitory neurons from the cortex/hippocampus. Notably, we found that Parkinson's disease is not only genetically associated with dopaminergic neurons but also with serotonergic neurons and cells from the oligodendrocyte lineage. Using post-mortem brain transcriptomic data, we confirmed alterations in these cells, even at the earliest stages of disease progression. Altogether, our study provides a solid framework for understanding the cellular basis of complex brain disorders and reveals a new unexpected role of oligodendrocytes in Parkinson's disease.

## PUBLIC LECTURES ON BRAIN SCIENCE

### STRESS AND OBESITY

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Damdindorj B, M.D., Ph.D.

Dean, Graduate School, Mongolian National University of Medical Sciences

Brain function is really important in regulating body weight. The hunger and satiety center is located in Hypothalamus. Hypothalamus senses energy storage through the actions of LEPTIN. Leptin, a hormone that is capable of effectively reducing food intake and body weight, was initially considered for use in the treatment of obesity. However, obese subjects have since been found to have high levels of circulating leptin and to be insensitive to the exogenous administration of leptin. Therefore, it is not wrong for a person to eat less and go hungry if possible. When you learn to eat properly, your brain cells will recover faster, and your thinking and memory ability will improve. As long as the hunger and satiety centers of the human brain function normally, you will not lose too much

weight or not gain too much weight. Science has shown that good brain function can have a beneficial effect on other organs. However, Stress can affect brain functions, particularly mental, psychological, and memory abilities, as well as health, obesity, diabetes, high blood pressure, stroke, and cancer. The sudden strong psychological shock suppresses the feeding center. A person who is overly depressed or in a state of shock may not eat or start eating too much. Also, during long-term chronic stress, blood sugar levels are consistently high. This makes you want to eat more often, and you want to relax after eating a lot. As a result, the amount of fat increases and obesity develops. People who learn to control their diet and exercise are less likely to be stressed.

## PUBLIC LECTURES ON BRAIN SCIENCE

### LANGUAGE SKILLS AND THE BRAIN

Nansalmaa N, Ph.D.

Faculty of Humanities, School of Sciences, National University of Mongolia

This talk analyzes the relationship between language skills and brain function based on the findings of neuroscience research by breaking it down into four functions of language skills: speaking, listening, reading, and writing. There are two forms of human language: oral and written. Oral language has two sides, speaking and listening, and is the first form of human speech, whereas written language, consisting of reading and writing, took form later. It goes into how the brain organizes these two forms belonging to different times and evolution stages of the homo sapiens.

Understanding the principles of brain function opens up a myriad of possibilities tying together the results of neuroscience research with human development and education, the aim being “To organize language education at all levels with a scientific basis”, from children’s first language acquisition to foreign language acquisition.

## **PUBLIC LECTURES ON BRAIN SCIENCE**

### **BRAIN STUDY INITIATIVES AT THE MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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Baasandash Ch, Batbayar Kh

Graduate School of Business, Mongolian University of Science and Technology  
Open Education Center and Department of Technical Mechanics, Mongolian University of Science and Technology

At a time when the brain science is developing in Mongolia, we introduce some of our research projects in order to highlight the research opportunities, competencies and interests of researchers at the Mongolian University of Science and Technology. Traditional nomadic lifestyle often requires experimental and simulated studies of injuries such as spinal cord injuries, and other hand, in recent years there has been lack of traditional cultural education for urban children and young people due to urbanization, moreover COVID 19 conditions and urbanization-related

mobility disorders and stresses are spreading widely and lastly. There is also a need to develop the use of sensory therapies, such as horse riding and animal husbandry, in the treatment and nursing of people with disabilities. We have focused our research on identifying back injuries, analyzing them with computer simulations, and developing new human and horse-friendly saddle designs. As a result, we are introducing proposal to establish a four-seasonal education and research center in the suburbs with traditional nomadic lifestyle.

## PUBLIC LECTURES ON BRAIN SCIENCE

### BRAIN HEALTH AND LEARNING: RECRUITING THE POWER OF BRAIN

Darambazar G, M.D., Ph.D.

University High School, Mongolian National University of Medical Sciences

The brain is always changing, as a result of environment and experience. Understanding how the brain converts information into learning provides keys to the best instructional strategies and learning experiences. Recent advances in neuroscience allow researchers to study the brain and revolutionize the understanding of how we learn. As a result, today we know more about learning than ever before, which provides great opportunities for training and development professionals to harness new insights and apply this new knowledge to advance the field.

Learning is a physical process in which new knowledge is represented by new brain cell connections. Repeating an activity, retrieving a memory, and reviewing material in a variety of ways helps build thicker, stronger, more hard-wired connections in the brain. We now know from neuroscience that the formation of neural connections and its strength can be enhanced. For example, specific exercise routines, optimal sleep structure, and silencing the mind can all

enhance learning. Nature and nurture affect the learning brain. In order to learn, you need to be able to focus, sometimes for relatively long periods of time. In neuroscience, attention refers to the brain processes allowing us to focus on some aspects of our environment, excluding others. For instance, focusing on this article you are reading right now, and excluding the ambient noise around you. Multitasking has become a way of living and working for many people. Unfortunately, our brains are not wired for multitasking because most of us can only apply our full conscious attention to one stimulus at a time. Our working memory- this is the part of the brain that allows us to focus our attention on a task such as reading-continues to interact with our long-term memory where we retrieve and store specific information. If we try to conduct two tasks at the same time, we must switch between the different tasks and an overload results between our working memory and long-term memory, which causes us to lose time.

## PUBLIC LECTURES ON BRAIN SCIENCE

## CLINICAL USE AND TREATMENT VALUE OF CANNABINOIDS

Chojjamts G, M.D., Ph.D.

Otoch Manramba University

Cannabinoid receptors located throughout the body, are part of the endocannabinoid system, which is involved variety of physiological functions including appetite, pain-sensation, mood and memory. Cannabinoid receptor are of a class of cell membrane receptor in the G protein-coupled and lipophilic receptor super family. Cannabidiol (CBD) receptors are activated by three major groups of ligands: endocannabinoids, produced by mammillary body; plant cannabinoids (such as  $\Delta$ 9-tetrahydrocannabinoid (THC) produced by the cannabis plant) and synthetic cannabinoids (such as HU-210). There are two known subtypes of cannabinoid receptors, termed CB (1990) and, CB2(1993), CB1 receptor is expressed mainly in the brain (CNS) but also in the lungs, liver and kidneys CB1 receptor are partial agonist, anandamide. The CB2 receptor is expressed mainly in the immune system and in hematopoietic cells and brain as well. Also researchers are discovered novel cannabinoid receptors that is non-CB, non-CB2, which are expressed in endothelial cells and in the brain. The protein sequences of CB1 and CB2 receptors are about 44%-68% similar. Cannabinoids (CBD) bend reversibly and stereo-selectively to the CB receptors. Some of selective cannabinoids have been developed which theoretically may have advantages for treatment of certain diseases such as obesity. Synthetic THC is prescribed under the INN Dronabinol (BN: Marinol) to treat vomiting and for enhancement of appetite, mainly in people with AIDS as well as for refractory nausea and vomiting in patient undergoing chemotherapy. Cannabis that is first time approved as a herbal drug in the UK in 2010 as a mouth spray for people with multiple sclerosis to alleviate neuropathic pain, spasticity. Cannabinoid containing medicine are under clinical study. Phase

I and Phase II level. According to meta-analysis of CBD products indications for treatment chronic pain, spine treatment resistant epilepsies and AEs caused by chemotherapy. Cannabis based products for medicinal use contain cannabinoids derived from the cannabis plant, including,  $\Delta$ 9-tetrahydrocannabinol (THC), cannabidiol (CBD) or a combination of THC and CBD. Synthetic cannabinoids for medicinal use typically mimic the effects of specific cannabinoids such as THC. These products are not licensed for specific medical indication but are used of license for medicinal proposes in many countries, and are certified for quality according to good manufacturing practice. Some cannabis based products were already available for medicinal use before rescheduling in 2018. Sativex, an oral spray derived from the cannabis plant containing THC and CBD in a 1:1 ratio, is licensed for the treatment of spasticity in multiple sclerosis in 29 countries, including the UK, Israel, Canada, Brazil and Australia. Epidiolex, an oral CBD solution derived from the cannabis plant was licensed by the US Food and Drug Administration in June 2018 for the treatment of seizures in two rare and severe forms of childhood epilepsy. Endocannabinoid system (ECS) is a biological system composed of endocannabinoids, which are endogenous lipid-based retrograde neurotransmitters that bind to cannabinoid (CBD) receptors (CBRs) and cannabinoid receptor proteins that are expressed throughout the brain (CNS) and peripheral nervous system. The ECS may be involved regulating physiological and cognitive processes including fertility, pregnancy, pre-and postnatal development, various activity of immune system, appetite, pain sensation, mood and memory, and in mediating the pharmacological effects of cannabis.

## **PUBLIC LECTURES ON BRAIN SCIENCE**

### **USE CASES AND ACCESSIBILITY OF ARTIFICIAL INTELLIGENCE IN MONGOLIA**

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Bilegsaikhan B, B.Bs.

Senior Engineer, Machine Learning Team, AND Systems Tech

In recent years, information technology products and services have largely increased, and Mongolia's population has embraced various IT products for personal and professional uses in their daily lives. However, there is a lack of understanding and accessibility of artificial intelligence technologies in Mongolia. We will discuss common understandings of AI and the use cases and possibilities, and how to make artificial intelligence more accessible in Mongolia.



## **PUBLIC LECTURES ON BRAIN SCIENCE**

### **STRESS AND MENTAL DISORDERS**

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Jargal B, M.D., Ph.D.

National Center of Mental Health

- General understanding of stress and personality traits to cope with it
- Short and long-term effects of stress on human body
- Adaptation crisis
- Psychosomatic disorders
- Ways to cope with stress in a positive way

## PUBLIC LECTURES ON BRAIN SCIENCE

### SLEEP AND FATIGUE

Gantsetseg T, M.D., Ph.D.

Department of Mental health, Mongolian National University of Medical Sciences

There is no living things in the world who doesn't sleep or rest. A human kind spends their 1/3 of life span, about 28.3 years, for sleeping. However, who would want to spend their time just sleeping in this busy modern time as even the 24 hours is not enough? Thus, we have become likely to cut our sleep to work and then we likely to suffer from insomnia too. Lately, insomnia has been spreading worldwide like a pandemic disease. For instance: it is found that 1 in 3 people in the world is suffering from insomnia but can't handle with it. Plus, regarding to the Mongolian study from 2013, it is found that 1 in 5 people has insomnia. Sleep is essential thing like air and water to our body-mind, and brain function and long time sleep deficiency can be harmful that can make one die. The record of the longest duration that one spent without sleeping is 18 days 21 hours and 41 minute. The owner of this record demonstrated some symptoms such as hallucination, confusion, inattention and etc., Unfortunately, people are not aware of the harm of sleep deficiency. In the recent study works, it is informed that only one day without sleep or with short of sleep can be harmful as increase

the risk of diabetes, speed up the aging process, decrease the sexual drive, gain weight and increase the body fat storage. Sleep change can affect to not only physical health but also work performance, productivity as increasing the chance to make mistakes at work and make one vulnerable to stress. Sleep deficiency is the main reason of fatigue. In other words, insufficient and non-qualified sleep creates fatigue. Some scholars revealed that short or lack of sleep can decrease one's productivity same as a drunk person. For example, here, we will share the result of study of South Australian Sleep Research Center, which compared the fatigue to alcohol intoxication. In this study, it is revealed that 17 to 18 hours without sleep is equivalent to blood alcohol level at 0.05% and 20 and more hours without sleep is equivalent to blood alcohol level at 0.08%. Therefore, the reaction time and work productivity and performance will decrease as same too. However, people wrongly think they can adjust their short sleep and unawareness of fatigue. In fact, due to their short sleep people become fatigued and put themselves and others under risk to do an accident.



POSTER SESSION

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MULTIDISCIPLINARY  
BRAIN SCIENCE

2020

## POSTER PRESENTATION

### A STUDY ON MONGOLIAN AND CHINESE COLLEGE STUDENT'S MARRIAGE VIEW AND THEIR RELATIONSHIP WITH PERSONALITY TYPES

ARUNA

Erenhot International College Of Inner Mongolia Normal University

Marriage and love is a lifelong subject, which is also a hot topic among undergraduates. The view on love and marriage, which refers to the basic opinion of the courtship, married life and sex, is an important part of undergraduates outlook on life. It not only affects their physical and psychological health but also their college life and studies. So far, there have been many related researches abroad, and although the inland researches have started relatively late, a few achievements have been gained. This paper explores the localized pattern of Chinese and Mongolian undergraduates' view on love and marriage, including the features and differences according to their personality. The reliability and validity of the questionnaire is high, which provides an empirical date to the love and marriage education of undergraduates. This paper adapts Undergraduates' Love and Marriage questionnaire, which has intended for 400 undergraduates, and comes into the following.

**Conclusion:** (1) There are significant differences between the love and marriage views of Mongolian and Chinese students. Significant differences between the various factors of love and marriage Views. Marital roles concept showed more conservative than any other factor characteristics. (2) There were significant differences between Mongolian and Chinese undergraduates on love and marriage values factor. There were significant differences in the sex choice concept of marital fidelity. (3) There were significant differences between different grades undergraduates on love and marriage values factor. Juniors idea of love and marriage in the performance of the most modern and open. (4) There were significant differences between different gender on the love and marriage views. Girls are more traditional and conservative. Difference in the concept of sex roles and marital

fidelity concept. Women are significantly more conservative in these two dimensions. (5) There were significant differences between Students from different places towards love and marriage. Village students are more conservative. The concept of rural students' role in the marriage, the love motive factor is more conservative and traditional. (6) There were significant differences between Students from different major. The students majoring in liberal arts are more conservative. Showed differences in the concept of sexual choice, the marriage role concept, marriage tendency and motive of love, marital fidelity concept. Liberal arts students are more conservative. (7) Undergraduates students' view of love and marriage have significant differences on the Parents' marriage condition. Undergraduates whose parents marital inform normal have more conservative and traditional love and marriage views. Differences shows on choice view of sex, marital fidelity concept. Different living conditions of the Students' idea of love and marriage views. Love and marriage of students living with parents is the most traditional and conservative. There were no significant differences between Marriage Views of undergraduates on parents' relationship. There were no significant differences between Marriage Views of undergraduates on whether talking about love and marriage with their parents. (8) The students' views are relevant to their personality types. Students marriage and love value concept with inward and outward personal type show a significant negative correlation, a significant positive correlation with neuroticism. Regression analysis showed that the role of inward and outward and neuroticism are confirmed in this research have define power of statistic prediction about Marriage Views of undergraduates.

## POSTER PRESENTATION

### BASIC PRINCIPLES OF QUANTUM PSYCHOLOGY AND TRADITIONAL MONGOLIAN CULTURE

Jadamba B, Erdenechuluun D, Khulan O

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**Introduction:** The following research work is dedicated to reveal that the basic principles of quantum psychology are embedded in traditional Mongolian culture, analyzing and comparing the works of foreign and domestic scholars and Mongolian proverbs on quantum psychology. The subject of our research was the basic principles of quantum psychology reflected in the works of foreign and domestic scientists, Mongolian proverbs and their interrelationships. We began our research by clarifying and precisising the basic principles of quantum psychology from the scientists' works. Thereafter, we discovered three Mongolian proverbs for each principle and analyzed and synthesized them. The findings are that the Mongolian proverbs define the principles of quantum psychology. As the each principle of quantum psychology is defined by three Mongolian proverbs from three angles we consider that the quantum psychology basic principles are embedded in the intellectual culture created by nomadic Mongolians.

**Methods:** A method of analyzing the quantum psychology basic principles through proverbs

**Results:** Based on a comparative study of the basic principles of quantum science with the proverbs which is the true interpretation by the Mongols' discernment wisdom. We are drawing the following conclusions:

- It is certified that the principle of "replenishment" of quantum science, such as ..., existed in Mongolian heritage.
- It is certified that the principle of "independence" of quantum science, such as ..., existed in Mongolian heritage.

- It is certified that the principle of "coherent unity" of quantum science, such as ..., existed in Mongolian heritage.

**Conclusion:** Every thing and phenomenon oppose each other, also complete each other while denying each other and replacing each other. This is a dual beginning philosophy created by nomadic Mongolians. There are the Mongolian proverbs:

"A and E is beginning of Books

Arga and bilig is beginning of Universe "

"Everything starts from one , then into two and becomes three at the end. things first. These three are the universe. "

"Everything has a purpose, every arrow has a point he said.

"... but the existence of this co- existence must be in harmony with all the rules and regulations ..."

(Demchigdorj, 1995). Existence exists when the pairs of beginning, the arga and bilig is united in harmony. The meaning is expressed in the proverb, If conciliates it will be accomplished

If gossips it will be corrupted

About the existence of reality or quantum coherent unity,

"Harmony of the multitude , the Universe rule.

" grow by roots, join by action"

"Two people are far away but connected by events Two mountains are far away but meet by clouds and fog" and so on.

**Keywords:** Quantum Psychology Sector, Fundamental Research Center for Education, Mongolian State University of Education

## POSTER PRESENTATION

### DETERMINATION OF SURVIVAL TIME OF SKULL AND BRAIN TRAUMA BY PATHOHISTOLOGICAL METHODS

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<sup>2</sup> Department of Forensic Medicine, National Institute of Forensic Science

**Introduction:** To define the survival time depending on changes of mortality hematoma due to skull and brain trauma by pathohistological method.

**Methods:** Research team had done retrospective study in 3640 case material with 105 file documents in autopsies of head injury of forensic medicine and research Department of National Institute of Forensic Science.

**Results:** Out of 372 cases studied, males comprised 152(83%) of cases, female were 32(17%), male to female ratio was 5:1 and age group of 40-49 years 53(28.8%) were commonest victims (mean age 42±15.9). Anteriority cause of trauma was 257(69.1%) blunt force trauma in the condition of our country and to consider the result. Also

we defined 30 cases to estimate time of case mortality head injury by histochemical method Martius Scarlet Blue stain, which done histological examination. Among participated cases 10 died after 0-6h, 2 cases died after 6-12h, 13 cases died after 12-18h, 3 cases died after 18-24h, 1 case 24-48h, 3 cases died after 48h up.

**Conclusion:** Men mortality who have head injury resulted from the firm and dull things occupies most of the percentage in our research. Trauma existence period was accurately defined when we defined the fibrin age by histochemistry stain.

**Keywords:** Skull and brain trauma, survival time, forensic medicine, pathohistology, MSB (Martius Scarlet Blue)

EPILEPSY AND MENTAL HEALTH ISSUES

Sarantsatsral T<sup>1</sup>, Enkhchimeg P<sup>1</sup>, Uyanga L<sup>1</sup>, Otgontuya D<sup>2</sup>, Gantsetseg T<sup>2</sup>

<sup>1</sup> National Center for Mental Health

<sup>2</sup> Department of Mental Health, School of Medicine, MNUMS

**Introduction:** Epilepsy is the most common serious neurological disorders affecting about 1% of all population in worldwide. It is characterized by recurrent epileptic seizures. The underlying mechanism of epileptic seizures is excessive and abnormal neuronal activity in the cortex of the brain. The WHO reported that about 50 million people have epilepsy in February 2016. Most of those with the disorder (80%) are in low income populations or the developing world. Epilepsy affects negatively to patient's socio - psychological state and quality of life and it is more common neurological disease after stroke and dementia. Therefore, we aimed to study the level of anxiety, depression and self-esteem in people with epilepsy.

**Methods:** We used cross sectional study method with purposive sampling. Total of 45 patients diagnosed with F07.8 (Other organic personality and behavioral disorders due to brain disease, damage and dysfunction) admitted to outpatient and inpatient unit of Mongolian National Mental Health Centre due to sexual abuse from January to July, 2020. We interviewed all participants individually, using demographic questionnaire, CES-D questionnaire to detect depression, Spielberg Khanin scale which has 40 questions to identify anxiety, and Katz index of independence in activities of daily living. The outcomes were analyzed with SPSS 23.

**Results:** Ages ranged from 29-75 (median age  $49 \pm 8.5$ ), 24 were male (53.3%), and 21 were female (46.7%) in total 45 patients with epilepsy. Level of baseline anxiety was high in 84.4% ( $n = 38$ ), moderate in 15.6% ( $n = 7$ ) and 55.6% ( $n = 25$ ) had high levels of psychological anxiety. 15.6% ( $n = 7$ ) of total 45 patients had no depression, 26.7% ( $n = 12$ ) had mild to moderate depression, and 57.8% ( $n = 26$ ) was severely depressed. Therefore, we studied whether the presence of anxiety in patients with epilepsy contributed to the development of depression. In a linear regression, when the psychological anxiety questionnaire score increases by one, the depression questionnaire score increases by 0.872 times, which was explained by 46 percent ( $r^2 = 0.458$ ,  $p < 0.017$ ), was statistically significant. For the Katz index of independence in activities of daily living, 93.3% ( $n = 42$ ) did not lose their ability, 2.2% ( $n = 1$ ) lost their ability and 4.4% ( $n = 2$ ) had decreased ability to serve their self.

**Conclusion:** About 57% of patients with epilepsy have severe depression. When the psychological anxiety questionnaire score increases by one, the depression questionnaire score increases by 0.872 times, which was explained by 46 percent ( $r^2 = 0.458$ ,  $p < 0.017$ ).

**Keywords:** Depression, anxiety, activities of daily living, brain trauma, scale



## POSTER PRESENTATION

## ESTIMATION OF DENTAL ABNORMALITIES, MALOCCLUSION IN PATIENTS UNDERGONE HEAD COMPUTED TOMOGRAPHY AT MONGOLIA-JAPAN TEACHING HOSPITAL

Norovbanzad D<sup>1</sup>, Tuvshinjargal D<sup>2</sup>, Ariuntungalag B<sup>4</sup>, Manduul E<sup>2</sup>, Tugsjargal P<sup>2</sup>,  
Munkhbaatar D<sup>2</sup>, Tsolmon J<sup>3</sup>

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<sup>4</sup> Lux Med Clinic

**Introduction:** Malocclusion is a morphological variation among individuals has a large impact in terms of discomfort, quality of life, and social and functional limitations. The surveillance studies on malocclusion were performed in Mongolia in between 1983 and 2011. The results indicated that malocclusion has consistently increased in population of Ulaanbaatar. Over 14 years, computed tomography (CT) has been widely used in the field of neurology, traumatology, and other head& neck abnormalities in Mongolia. No previous reports on teeth abnormalities detected at routine head CT are available, therefore we conduct an investigation on dental abnormalities and malocclusion with routine head CT.

**Methods:** We reviewed images of 50 patients who were underwent head CT imaging at MNUMS's Mongolia Japan Hospital. All examinations were performed with 160 slice CT scanner (Canon Aquilion Prime). Scan parameters were 160 x 1.0 mm collimation, table speed/rotation time 12.5 mm/0.3 sec, 1.0 mm section thickness, 100-120 kV, and 150-360 mA. Two radiologists with 8-year experience of interpreting the head CT images reviewed the images and reached a consensus on all findings (thin axial, coronal sections, reformatted dental panoramic image, and 3D volume rendered images). The exclusion criteria were the loss of DICOM format, missed jaw image, and motion artifacts.

**Results:** The total of 50 head examinations performed between June 2020 and August 2020, were

available for review, from them 23 (46%) were males and 27 (54%) were females, with age range being from 13-65 years. In respect of education, 18(36%) of all patients had education or less than college, lower professional education or college was in 12(24%), and higher professional education or bachelor degree in 20(40%). There was no statistically significant difference between socio-demographic data and clinical characteristics such as caries, tooth loss, periapical inflammation, cyst, fracture, and number of permanent teeth in Kruskal-Wallis and Chi square tests. Besides, sociodemographic data and occlusion classification has not statistically significant difference with Chi square test. The clinical characteristic of the patients is presented in table 1. Association between TMJ, occlusion classification and clinical characteristics was {Dental caries 0-3 (n=8, 48.8%); Tooth loss 0-10 (n=34, 68%); Periapical inflammation 0-4 (94%); Periapical cyst absent (n=46, 96%); Tooth fracture (n=49, 98%); Permanent teeth 21-32 (n=34, 68%); TMJ no gross abnormalities (n=49, 98%); Occlusion classification normal (n=31, 62%)} not statistically different.

**Conclusion:** There was a relatively high level of permanent teeth loss in patients receiving head CT for other than dental indications. Failure to show association with sociodemographic characteristics may lay in the study's current sample size.

**Keywords:** Computed tomography, occlusion classification

## HEAD INJURY-RELATED MORTALITY IN ULAANBAATAR, 2014-2016

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<sup>2</sup> Department of Forensic Medicine, National Institute of Forensic Science

**Introduction:** This study aims to determine the causes and risk factors of head injury cases, and causes of head injury-related mortality.

**Methods:** All deaths registered in Department of Forensic Medicine, National Institute Forensic Science, National Trauma and Orthopedic Research Center from 2014 to 2016, total 5450 mortality cases were reviewed and 536 head injury-related cases were collected for this study.

**Results:** We reviewed 536 head injury-related deaths, which represented 8% of all mortality cases during 2014-2016. 470 (87.7%) were male and 66 (12.3%) were female. Male to female ratio was 7:1 and mean age was 42±15. Among head injury-related deaths, 363(67.7%) cases were from direct by firm and dull stuffs, 130(24.3%) from

road traffic accidents and 34 (6.3%) falls from height. One hundred eighty three cases (34.1%) showed alcoholic consumption at the injury time. By the characteristics of injury, 286 (53.3%) cases showed subdural, 129 (24%) epidural hematoma, 400(74.6%) subarachnoid hemorrhage, and 332 (64%) cases showed cerebral contusion.

**Conclusion:** Male adults have more deaths due to direct head injury from assaults. Head injury progresses to death by its own pathogenesis.

**Keywords:** Head injury, cause of death, intoxication, blood type, autopsy.

## POSTER PRESENTATION

## DESCRIPTIVE ANALYSIS OF HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS) IN MONGOLIAN POPULATION

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\* Equal contribution

**Introduction:** The hospital anxiety and depression scale (HADS) is a widely used psychometric instrument for evaluating psychological distress from anxiety and depression. HADS has not yet been validated in Mongolia. The aim of this study was to examine changes in mongolian population on self-rated mental health problems over time, and to explore demographic, geographic and socio-economic factors as determinants of increased or decreased anxiety and depression symptoms. Data collection occurred from July to August 2020 from 4 age group participants in the same living districts of Ulaanbaatar Mongolia. Pilot test of the original pool 14 HADS items, and to assess the appropriateness of the items for Mongolian culture and their perceived connotations. As a result of Study, a subset of items characterized by both adequate cultural appropriateness and reasonably high item-total correlations would be selected for further analyses.

**Methods:** All the participants freely agreed to answer a questionnaire and gave informed consent. Study was approved by the Mongolian National University of Medical Sciences research ethics committee. We devised a questionnaire to obtain demographic information on age, gender, marital status and education. The questionnaire also included the Hospital Anxiety and Depression Scale (HADS), and the Mongolian

translation has been done by researchers of Brain Science Institute, MNUMS. Interpretation of the HADS scores was performed according to the methodological reference adopted. As such, a score between 0 and 7 was interpreted as no case of depression or anxiety, scores between 8 and 10, as a possible case and scores from 11 to 21, as a probable case. Possible means something that has a chance of being or happening and the word probable means something that can be proven or that appears to be true. Statistical analyses of the data was performed with the use of the statistical program Stata/IC 14.2. The adopted level of significance was  $< 0,05$ .

**Results:** Participants (N = 189) age varied between 13 and 65 years (M = 39.8, SD = 13.9), 143 participants were female (75%) and 46 (25%) were male. During measurement, it was observed that 48 (26%) of participants were possible cases and 32 (17%) were probable cases of anxiety. 51 (27%) of participants were possible cases and 17 (9%) were probable cases of depression.

**Conclusion:** The HADS can be used to examine psychological distress in the Mongolian population. Findings are discussed and recommendations made.

**Keywords:** Validation, Psychometric, Anxiety, Depression

## LEARNING MOTIVATION AND AFFECTING FACTORS

Purevsuren G

National Defense University of Mongolia

**Introduction:** This article represents the analysis of research results, aimed at study of motivational sphere and determination of some factors influencing on learning process. The study of motivation, both conscious and unconscious reasons to activate people into action, is particularly important in understanding the process that initiates and maintains goal-oriented behaviors. The learning process plays directly an important role for human success and professional development. Motivation is the driving force to learning and key of the success. Motivation in education can have a dramatic impact on students' performance and results. In education, motivation can have a variety of effects on students' behavior, preferences, and results. The purpose of this work is to identify and analyze student motivation and some of the factors that affect it.

**Methods:** We reviewed the theoretical concepts and trends in motivation and conduct comparative study using Leontyev's activity theory methodology between junior and senior students' learning motivation. Also, we surveyed and observed some factors that influence students' learning motivation and analyzed the results.

**Results:** The findings show that as the grade increases, the students' learning motivation decreases. The lack of motivation affects students'

learning process and gradually they are losing their interest, creativity and performance and failing to achieve a goal. However, the desire for self-acceptance, socializing and to be winner seem to be stable. The more students study a professional subject and learn the specific knowledge and skills of their chosen profession, their positive motivation predominates and the professional orientation is developed. The inner motivation of the students who choose their profession is deepening and reinforced. The indicators of external positive motivation increased because of the number of training, competition, cooperation with other universities and organizations exchanging experiences and expanding reforms.

**Conclusion:** It was statistically concluded that external positive motivations such as community support and professional reputation play a dominant role for students' career choices. The socially significant internal motivations increased during the study period and external negative motivations decreased. The motivation to choose a profession was mainly influenced by the parents' professional characteristics, the demand of the chosen profession in the labor market, opportunities to increase their carrier the future, and the desire to participate and learn in international cooperation in defense.

## POSTER PRESENTATION

**PSYCHOMETRIC PROPERTIES OF THE MONGOLIAN VERSION OF THE 26-ITEM WHOQOL IN THE MONGOLIAN POPULATION: PRELIMINARY RESULTS OF A POPULATION BASED VALIDATION STUDY**

Enkhjin B<sup>1</sup>, Enkhnarant T<sup>2</sup>, Tsolmontuya A<sup>3</sup>, Otgontuya D<sup>3</sup>, Tsolmon J<sup>3</sup>, Battuvshin L<sup>1</sup>

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**Introduction:** The assessment of quality of life (QOL) in a population is an important part of public health management. In this article, we examined the psychometric properties and validation of The World Health Organization Quality of Life (WHOQOL-BREF) questionnaire. WHOQOL-BREF is a widely used scale that enables the assessment and international comparisons of the quality of life. This study aimed to validate the psychometric properties of the WHOQOL-BREF questionnaire for use in Mongolian population.

**Methods:** This cross-sectional study was conducted in July-August 2020. The study was composed of 244 participants in Ulaanbaatar, Mongolia. The Mongolian version of WHOQOL-BREF instrument was used to assess the QOL of Mongolian population. The WHOQOL-BREF was translated from English to Mongolian by researchers of the Brain Science Institute of Mongolian National University of Medical Sciences (MNUMS). It contains 26 items: 24 items of the WHOQOL-BREF were categorized to four domains physical (7 items), psychological (6 items), social (3 items) and environmental (8 items) with two items not considered where one item measures overall QOL (item 1) and another item gauges the level of satisfaction with health (item 2). The result is calculated on four domains of quality of life and on two separate items that

measure overall perception of quality of life and overall perception of health. The mean score of items within each domain is used to calculate the domain score. Results on domains represent the sum of results of items. A higher sum of points represents a higher quality of life on a single domain.

Statistic analysis was performed by SPSS 25.0. The reliability and validity of the questionnaire were assessed by Cronbach's  $\alpha$  coefficient and factor analysis respectively.

**Results:** A total of 244 participants participated in the study. All participants were informed about the study's purpose and asked to give oral and written informed consent. Study was approved by the MNUMS Research Ethics Committee. Participants were 24% males and 76% females with an average age of  $39.49 \pm 14.3$  years. About domain results: Domain 1 (physical quality):  $13.19 \pm 2.7$ , Domain 2 (psychological):  $15.03 \pm 2.6$ , Domain 3 (social):  $14.49 \pm 3.1$ , Domain 4 (environmental):  $14.20 \pm 2.8$ . The overall Cronbach's  $\alpha$  coefficient of the WHOQOL-BREF questionnaire was 0.910.

**Conclusion:** The WHOQOL-BREF was reliable and valid in the assessment of the QOL of the Mongolian population. Overall, quality of life of the participants is similar to other populations including participants who were enrolled in Chinese and Russian validation studies.

RESEARCH ON FIRST YEAR STUDENTS STRESS LEVEL

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**Introduction:** Many studies have shown that students and young people, especially freshmen students, face new challenges in adapting to new environments, such as changes in sleep patterns, diets, and psychological stress, which depend on personal organization. Most researchers have suggested that the main causes of behavioral disorders are psychological disorders, anxiety, and the use of psychoactive substances, while a small number of researchers say that 45-70% of people are not socialized. Therefore, we set a goal to study the anxiety of freshmen students.

**Methods:** The survey was conducted in a random sample of 84 first-year students at Etugen University and Medical School using a specially designed questionnaire in January 2020. The following standard detection tests with high sensitivity and specificity, commonly used internationally by Hanin-Spielberg, are used to assess anxiety. The statistical analysis of the survey was performed on SPSS Statistics version 23 software.

**Results:** A total of 84 students, 72 (85.7%) women and 12 (14.3%) men aged 16-33 years, participated in the study; 61.9 percent of students had moderate psychological anxiety and 81 percent had low level of congenital or underlying anxiety. However, 1.2% of the participants did not have psychological anxiety and 8.6% did not have congenital anxiety. In the study of adaptive quality, 76.2% (n = 64) had poor neurological stability, 66.7% (n = 56) had stable communication skills, and 54.8% (n = 46) had stable moral standards. In terms of individual adaptability, 98.8% (n = 83) said it was low. Therefore, when we compared adaptability with anxiety, it was more likely that the ability to communicate with others would be unstable (p <0.015) when congenital anxiety levels were defined as moderate or higher.

**Conclusion:** The proportion of students who did not experience psychological distress (1.2%) was very low, and those with moderate or higher congenital anxiety were more likely to have unstable interpersonal skills (p <0.015).

**Keywords:** Stress, personality, adaptability, success.

## POSTER PRESENTATION

### STUDY OF MONGOLIAN OFFENDERS' CRIMINAL THINKING STYLE

Galsanjamts G

Mongolian National University of Education

**Introduction:** Crime depends not only on social and economic status and poverty, but also on individual thinking styles. Therefore, as crime is a psychological specific activity, it is important to study the criminal thinking style. This will have a positive impact on prevention of crime through rational intervention. We conducted this study to examine the criminal thinking style of Mongolian offenders and to determine the risk of their re-offending.

**Methods:** We used Psychological inventory of Criminal thinking styles to examine criminal thinking style of offenders who sentenced in open and closed prisons. Data were collected from 419 Mongolian male and female offenders. The age of the offenders ranged from 18 to 73 years.

**Results:** According to the general criminal thinking score, about 60 percent of the respondents had a criminal thinking style. A comparison of proactive and reactive criminal thinking patterns shows that 2 out of 5 people intentionally commit a crime. In other word, their criminal thinking is planned or goal directed. The survey found that 38 percent of all offenders may have committed the crime unintentionally or accidentally.

From the eight styles of thinking, following three are the most common: superoptimism, disconti-

nuity, and power orientation. It expresses that the most respondents have the following commonalities. The "Superoptimism" thinking style is related to the avoidance. It manifests itself in the hope that no one will know his criminal behavior. This way of thinking strengthens the offender's belief in his ability to commit crime. The "Discontinuity" thinking style is related to inconsistency in thinking and behavior or impatient. People with this thinking style are irresponsible in their promises, goals, and beliefs. The thinking style "Empowerment" is the criminal's need to dominate others and the environment in order to balance his or her ineffectiveness, powerlessness, incompetence, and weakness. Comparing the of criminal thinking style with the crime frequency of offenders, more than 45 percent of first- and second-time offenders have a criminal thinking style.

**Conclusion:** Building prison is not solution for fighting with crime. It is considered effective to change the thinking style and behavior of the offender

**Keywords:** Crime, assessment, criminal thinking style

## STUDY ON MEDICATION ADHERENCE AMONG ARTERIAL HYPERTENSION PATIENTS OF FAMILY HEALTHCARE CENTERS IN ULAANBAATAR

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<sup>1</sup> School of Medical Science, <sup>2</sup> Department of Family Medicine, School of Medicine, Mongolian National University of Medical Sciences

**Introduction:** The main cause of death in the population has become the non-communicable diseases, with increasing cases each year. The World Health Organization estimates that stroke and heart attack are among the 10 leading causes of non-communicable diseases, out of which the arterial hypertension is the major cause. In Mongolia, the prevalence of arterial hypertension and its risk factors were studied, but the monitoring of treatment results, medical adherence, and the factors for them have not been studied within the scope of Family Healthcare Center (FHC), which is the main reason of conducting this study.

**Purpose:** Study of medication adherence among arterial hypertension patients of family healthcare centers in Ulaanbaatar.

**Methods:** The study was conducted between May and August 2019 using the cross-sectional prospective model of analytical study. A simple random sampling was collected from 27 FHCs' physicians of 9 districts of Ulaanbaatar, MAP assessed with 3 groups of 11 questions, and the 186 patients of those FHCs were evaluated using Morizky scale questionnaire consisting of 4 groups of 36 questions, and the collected data were assessed using the STATA 12 software. The value of the 'p' result is considered statistically significant when it is lower than 0.05.

**Results:** The average age of physicians (standard deviation) was 28.9 (1.1) and 85.2% (n = 23) were female. The total number of physicians were assessed by MAP method, 14.8% (n = 4), 25.9% (n = 7), 51.8% (n = 14) of physicians were not performing up to the standards the arterial hypertension diagnosis, treatment and monitoring respectively. (p <0.0001). The average age of total survey patients was 37.7 (± 13.6), of which 60.8% (n = 113) are females, 66.6% (n = 124) had a university degree and 33.4% (n = 62) had a lower than secondary education.(p=0.028), 58.1% (n = 108) of respondents had lower income than the average household income (MNT 848,800) set by the National Statistical Office in 2017. When respondents were assessed by Morizky scale, 13.4% (n = 25) was good, 54.3% (n = 101) was medium, 32.3% (n = 60) was not satisfactory. (p <0.0001). 16.7% (n = 31) had no risk of cardiovascular disease.

**Conclusion:** The medication adherence of arterial hypertension patients is not satisfactory. This is dependent on both physicians and the patients. It is necessary to improve the management of arterial hypertension monitoring in order to improve the quality of primary care provided by physicians at the FHCs and the medication adherence of arterial hypertensive drugs in the FHC.



## POSTER PRESENTATION

### THE RESULT OF INTERPRETATION ANALYSIS OF QUANTUM MECHANICS FROM THE ONE-WORLD APPROACH

Jadamba B, Oyungerel S, Delgermaa D

Mongolian National University of Education

**Introduction:** The significance of this work is to present the result of Quantum mechanics interpretations analysis based on the “one world approach” theory of nomadic Mongolians. The statistics of quantum mechanics, Copenhagen and Neumann’s interpretation, Everett’s formulation and etc., are all different by their approach to the core problem of quantum mechanics. The theoretical and methodological basis of our analysis is the “one world approach”, a modernized version of the nomadic Mongolians’ worldview (Jadamba, 2005). The subject is the interpretations of modern quantum mechanics and quantum psychology. The object of analysis is the relationship between the origin, cause, and meaning of those interpretations

**Methods:** Comparative theoretical study

**Results:**

- Revealed probability of quantum mechanics at the level of measurement. The evolution of the quantum system is unambiguous, and the cause is completely deterministic in its consequences before measurements.
- Action is irrevocably changed towards the future, the not coming “non-existent”. The future, the unfulfilled one or the “non-existent”, which is within the karma(action) itself, is the unifying action becoming ‘one’ and ‘bilig’ angle of the karma.
- An action is ‘one’ from the one world approach, which is constantly changed and flowed inward, and from the point of view of emptiness (doctrine) it is spontaneously unifying process towards ‘nothing’. The consecutive array of constantly changing and flowing moments compose the combinations

or unions of actions. The spontaneously combining and unifying moment is the certain component of action.

- The objective of quantum science is to inform and describe the probability of a physical system involved in an interaction in the certain moment of time and in a variety of states.

**Conclusion:** Action is unstable and irreversible, and constantly changed to own future and inward inside, and spontaneously unifying process. The concealed part of the flowing action is the “one” on the general concrete point, and it is “nothing” from the the general abstract point. That continuous, irreversible, ever-changing combinations of action forge the “one” (“one world”) that creates everything. Therefore, action is asserted as spontaneous law of the “one” who created everything or unrevealed state. When the ever-changing flow of action merges with the “one,” which is resurrected, and gives birth to all things, paused and accumulated, and the “consequences” or “result” is the “one”. The irreversible, ever-changing moments which are flowing inward inside create the coherent state of the unified universe. The ever-changing and systematizing moment of action is the unified universe coherent state.

**Keywords:** Quantum Psychology Sector, Fundamental Research Center foreducation, Mongolian State University of Education

## THE RESULT OF “QUIT SMOKING” TREATMENT

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**Introduction:** According to the literature 2015, it is estimated that 1.1 billion people or one in five people smoke daily in the worldwide. Smoking can create preventable non-contagious illnesses and also is a leading causes of mortality of such diseases. For instance, in the WHO report 2014, it is emphasized that 6 million people every year which is one person each six second, lose their life due to smoking related physical diseases and because of lung cancer 87% of smokers get sick and by COPD 93% of smokers get sick annually. Regarding to Mongolia, in the 2016 World Bank study, it is reported that 25.6% of total population smoke a cigarette. Moreover, in the report of World health index 2016 says 30.2% of cancer incidents occurred because of smoking and in total of 3589 people had died from direct smoking and 281 people had died from indirect smoking. Although 2/3 of people want to quit smoke, only 50% of them attempt to quit. However only 1/3 of those who attempt to quit seek evidence based treatment and only one in 10 people quit successfully.

**Methods:** A retrospective cohort study design was used to review the session data and to collect the study materials of the “QUIT SMOKING” treatment. The combined therapy which includes nicotine replacement therapy and cognitive behavioral

therapy was used in this treatment. We conducted totally six sessions with each participants within the three months period. Then followed up their quit state by telephone after 6 months from their quit date.

**Results:** Totally, 832 people enrolled in our QUIT-SMOKING treatment and started Nicotine replacement therapy (nicotine patches, gum and lozenges). However only 294 people, aged between 21 and 62, had completed the three months treatment and 208 out of them were remained as quitted after 6 months. The success rate of the participants who quitted in 12 weeks was 28.9% and for those, who quit in 6 months was 25%.

**Conclusion:** Based on the fact that this QUIT SMOKING Treatment had a success rate of 25% and International Programs have an average success rate between 22-45% it can be recommended that a QUIT SMOKING Treatment similar to this can be implemented in Mongolia. It can be recommended to be domesticated this Smoking cessation Program into Mongolia that its success rate (25%) is similar with international average success rate (22%-45%).

**Keywords:** Addiction, nicotine replacement therapy, Fagerstrom test, behavioral therapy

## POSTER PRESENTATION

## THE MATHEMATICAL MODEL OF PREDICTION OF COVID-19 SPREAD IN MONGOLIA

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The unknown respiratory infection, which broke out in Wuhan, China, in December 2019, spread around the world via international flights. As of July 24, 2020, it was registered in 216 countries, infected 15'257'287 people and 628'240 of them are dead. The World Health Organization (WHO) has announced that In Mongolia, which shares a 4,709 km border with China, the epidemic is beginning to cause severe health, political and economic damage, so the probability of the spread of COVID-19 can be calculated using a mathematical model called the SIR model based on data collected to date. Real-Time R0 (Reproduction Number) is the most important parameter in this calculation, which is determined by a positive PCR polymerase test how many days after infection. Our research team did not create any ethical violations during the research and used statistics provided by the Ministry of Health. After processing the required statistics, Gabriel Goh, a researcher at OpenAI, an artificial intelligence developer, used a cloud calculator to predict the spread of the epidemic and how the spread of the disease would have spread in Mongolia.

**Method:** We conducted SIR mathematical model of COVID-19 transmission in this study. The total population size of population  $N(t)$  is divided into three distinct subclasses of individuals that are susceptible, infectious, and recovered, named as  $S(t)$ ,  $I(t)$ ,  $R(t)$ , respectively. Parameters described as

transmission rate ( $\beta$ ), recovery rate ( $\gamma$ ). We showed the flow diagram of COVID-19 transmission according to the SIR model and we described the transmission dynamics by the following differential equations.

**Results:** Our mathematical model predicts the extent and duration of COVID-19 in Mongolia. We estimate that if COVID-19 is secretly distributed after March 10, 2020, the first confirmed case, it will rise from March 10, 2020, and will reach its top around Sep 10, 2020 – Sep 30, 2020; and finally will go down from between Dec 25, 2020 – Jan 15, 2021. Under such conditions, two kinds of hypotheses can be considered for the adequacy of the current measurement and whether the peak of the epidemic will occur around Oct 13, 2020 – Oct 18, 2020. About the numbers of patients, COVID-19 will affect more than 2,042,800 people in Mongolia or 61.87% of the total population, and 6.57% or about 217,000 of them will become ill. Infection is expected to decrease after about 3 months. According to this mathematical model, there is a probability of about 70 deaths, and the peak of the infection is estimated to be 203,560 patients to be hospitalized by October 15, 2020.

**Keywords:** COVID-19, SIR model, mathematical prediction, transmitted case, real-time R0

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... but uses **20% of the body's total energy and oxygen intake**?<sup>2</sup>

... only **5 minutes without oxygen** can cause **brain damage**?<sup>4</sup>

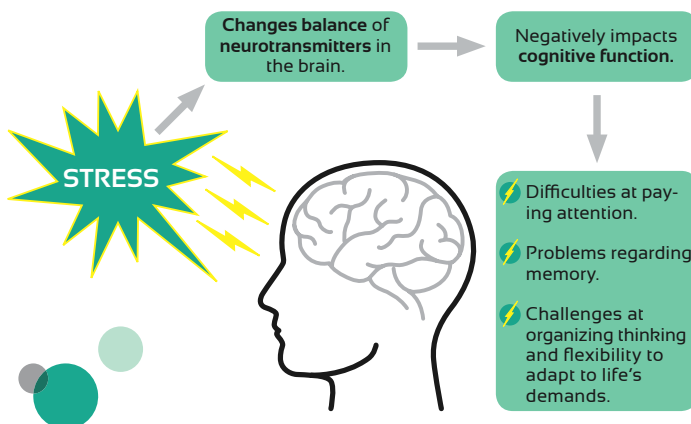
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**Lemon balm extract** modulates mood and cognitive performance.<sup>7</sup>

**Caffeine** has a positive effect on cognitive and physical function, mood and energy. It stimulates the brain and delays the onset of sleep.<sup>8,9</sup>

**Pantothenic acid (vitamin B5)** contributes to a normal mental performance and to the reduction of tiredness and fatigue.<sup>10</sup>

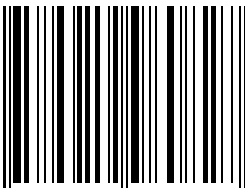
**Docosahexaenoic (DHA)** is an important omega-3 fatty acid. It is a major structural fat in the human brain and contributes to maintenance of normal brain function.<sup>10</sup>

<sup>1</sup> Marano, H.E. (2001): Depression doing the Thinking. Psychology Today.  
<sup>2</sup> Raichle, M.E. (2002): Appraising the brain's energy budget. PNAS. 99 (16)  
<sup>3</sup> R. Stufflebeam (2008): Neurons, Synapses, Action Potentials, and Neurotransmission. CCSI.  
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<sup>6</sup> Ehrlich, S.D. (2015): Ginkgo biloba. Overview. University of Maryland Medical Center.

<sup>7</sup> Althondzadeh S., Noroozian M. (2003): Melissa officinalis extract in the treatment of patients with mild to moderate Alzheimer's disease: a double blind, randomised, placebo controlled trial. J Neurol Neurosurg Psychiatry. 74 (7): 863-866.  
<sup>8</sup> Bittencourt Lda S et al. (2014): Prevents  $\beta$ -amyloid aggregation, generation of advanced Glycation-end Products (AGEs), and acrolein-induced cytotoxicity on human neuronal-like cells. Phyther Res.28 (11): 1615-24.  
<sup>9</sup> Bertil B. et al. (1999): Actions of Caffeine in the Brain with Special Reference to Factors That Contribute to Its Widespread Use. Pharmacological Reviews. 51 (1): 83-133.  
<sup>10</sup> European Commission (2012): Commission regulation (EU) No 432/2012.



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