4th IBRO-APRC ULAANBAATAR ASSOCIATE SCHOOL ON FUNDAMENTAL TECHNIQUES IN NEUROSCIENCE

GRADUATE SCHOOL, MONGOLIAN NATIONAL UNIVERSITY OF MEDICAL SCIENCES
INTERNATIONAL BRAIN RESEARCH ORGANIZATION
MONGOLIAN NEUROSCIENCE SOCIETY

August 9-14, 2021
Ulaanbaatar, Mongolia

PROGRAM AT A GLANCE

Time	Monday, 8/9/2021	Tuesday, 8/10/2021	Wednesday, 8/11/2021	Thursday, 8/12/2021	Friday, 8/13/2021	Saturday, 8/14/2021
	Cellular Neuroscience	Molecular Neuroscience	Systems Neuroscience	Clinical Neuroscience	Group discussions	Group discussions
09:00	Opening Ceremony (MNS, IBRO, MNUMS)				Opening Ceremony (The 8th Annual Meeting)	
09:15	L1: Circuitry mechanisms of energy balance	L2: Neurogenesis	L3: Neuroinflam-mation	L4: Synaptic plasticity	Keynote lectures (The 8th Annual Meeting, MNS)	Symposia (The 8th Annual Meeting, MNS)
10:15	Coffee break					
10:30	T1: Cell culture techniques	T3: DNA extracting protocols	T5: Optogenetics	T7: Sterotaxic surgery/ Tracing	Plenary lectures (The 8th Annual Meeting, MNS)	Symposia (The 8th Annual Meeting, MNS)
12:30	Lunch break					
13:30	T2: Stem cell research in Neuroscience	T4: RT-PCR analysis	T6: Immuno-histochemistry	T8: Behavioral testing	G1: Oral presentation tutorial	G3: Neuroethics/ Bioethics
14:45	Coffee break					
15:00	H1: Western blotting/ Part 1	H2: Western blotting/ Part 2	H3: Perfusion/ Cryostat sectioning	H4: Microscopy techniques/ Light, Confocal	G2: Poster presentation tutorial	G4: Case- based journal club (Neuroethics)
	L: Lecture, T: Tech-Talk, H: Hands-on session, G: Group discussion					

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INTERNATIONAL BRAIN RESEARCH ORGANIZATION

MONGOLIAN NEUROSCIENCE SOCIETY

GUIDEBOOK

AUGUST 9-14, 2021
Ulaanbaatar, Mongolia

ORGANIZING COMMITTEE

Mongolian National University of Medical Sciences

Sumberzul N. MD., Ph.D., Prof.
Damdindorj B. MD., Ass. Prof.
Darambazar G. MD., Ph.D.
Tserenbat M. Ass. Prof
Erdenezaya O. MD., PhD

Zesemdorj O. MD., PhD.
Khongorzul B. PhD.
Naranbat N. MD., PhD
Tsengelmaa J. MD., PhD

Ariunaa S. MD., PhD
Buyankhuu T. PhD
Choinyam B. MD, MSc.
Chimedlkhamsuren G. MSc.

International Brain Research Organization
Asia/Pacific Regional Committee (IBRO-APRC)

Cheah Pike See (Chair, 2021)
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia

Battuvshin Lkhagvasuren (2019)
Mongolian National University of Medical Sciences
Ulaanbaatar, Mongolia

Aurnab Ghose (2019)
India Institute of Science Education and
Research Pune, India

Yun Wang (2019)
Beijing University of Chinese Medicine and
Pharmacology, Beijing, China

Tadashi Isa (2016)
Kyoto University, Kyoto, Japan

Wing-Ho Yung (2019)
Chinese University of Hong Kong, Hong Kong,
China

Yukiko Goda (2021-23)
Deputy Director and Team Leader RIKEN
Center for Brain Science, Wako, Japan

Bronwyn Kivell (2021-23)
Associate Professor, Victoria University of
Wellington, Wellington, New Zealand

Mongolian Neuroscience Society

Battuvshin L. MD., PhD.
Damdindorj B. MD., Ass. Prof.
Darambazar G. MD., PhD.
Jambaldorj J. MD., PhD.
Chimeddulam E. PhD.

Otgon Z. MBA.
Enkhjin B. MD.
Enkhnaran T. MD., MSc.
Enkhzaya B. MD., MSc.

Volunteers

Ulemjjargal G, Batbayar M, Amarbayasgalant B, Amarbayar M

Editors:	Publication manuscript:	Printed by
Battuvshin L. MD., PhD.	Choinyam B. MD, MSc. Enkhjin B. MD.	Almaz press LLC

CONTENTS

It is my great honor and pleasure to welcome all participants to the 4th IBRO/APRC Associate School for graduate and post-graduate students, jointly organized by the Graduate School of the Mongolian National University of Medical Sciences, International Brain Research Organization (IBRO) and Mongolian Neuroscience Society.

Brain Science or Neuroscience already becomes a frontier science of the 21st century, since it is a multidisciplinary science that is integrated with physiology, biology, cytology, neuroimmunology, and mathematics.

The Mongolian National University of Medical Sciences aims to become one of the top 1000 universities in the World by 2024. Within this aim, we are promoting close collaboration with the International Brain Research Organization to nurture the young neuroscientists and researchers, and to contribute to the development of multidisciplinary research in Mongolian neuroscience.

It is indeed to note that we are successfully organizing our Associate School as virtual for the second time, even in this challenging period that derived due to the Covid-19 pandemic. The activities and scope of the Associate School have expanded to include scholars and professors from many other universities of Mongolia. We hope the situation of pandemics improves soon, and that our Associate School welcomes more attendees from different countries, and that we will be able to attend to the other Associate Schools of IBRO.

I am confident that, get encouraged by strong lectures, tech talks, and hands-on sessions that are delivered by highly talented and dedicated professors, our young scientists get acquainted with the world's frontier science and get equipped with world-class research skills. I wish all participants full of enjoyment and successful completion.

I would like to express my deepest gratitude towards the executives and members of the IBRO and APRC, as well as the organizing teams and faculties.

Let's spread globalized collaboration in scientific researches.

Sumberzul Nyamjav MD., Ph.D., Prof.
Dean, Graduate School, Mongolian National University of Medical Sciences

NEUROSCIENCE: A MULTIDISCIPLINARY, MULTILEVEL FIELD

It is of my utmost gratitude to welcome you to this 6-day IBRO-APRC Ulaanbaatar Associate School of Neuroscience 2021. This is one of the thirteen neuroscience schools supported by IBRO-APRC across the Asia Pacific region in 2021.

The title chosen for this neuroscience school, "*Multidisciplinary Brain Science 2021*" is timely as I strongly believe that an effective science communications and education can further enhance cooperation and multilateral collaborations in the field of Neuroscience research in Mongolia.

This scientific event aims to educate students/young scientists in brain research. It serves as an ideal platform to create quality interactions between aspiring students and young scientists with experts in the field. This event will further enhance communications and collaborations amongst scientist researchers and academicians at different levels of expertise. This networking opportunity can be a potential point to start discussing national neuroscience agendas to move forward into intense research and development, especially in the challenging issues of translating basic research discoveries into clinical applications.

I wish to express my sincere appreciation to the collaborative efforts from local and international speakers, for all your noble efforts in this knowledge-sharing activity. I hope that this IBRO-APRC Ulaanbaatar Associate School of Neuroscience 2021 would pave ways in harnessing support among key policymakers, authoritative leaders and philanthropists to increase resources for research and public education concerning brain function and health.

To the organizing committee lead by Dr. Battuvshin Lkhagvasuren and Prof. Damdindorj Boldbaatar, congratulations for your success in hosting this event in Mongolia. I wish you and team great success. To participants and awardees of the school, I hope you a good learning experience, gain new ideas and inspire to further explore this exciting multidisciplinary research field of Neuroscience.

Associated Professor Cheah Pike See
Chair, IBRO-APRC
(International Brain Research Organisation- Asia Pacific Regional Committee)

Faculty of Medicine and Health Sciences
Universiti Putra Malaysia

On behalf of the Mongolian Neuroscience Society, it is my great pleasure and honor to welcoming the attendees to the 4th IBRO/APRC Associate School.

The main notion of neuroscience is the study of the nervous system concerning the biological basis of consciousness, perception, memory, and learning. Neuroscience links our observations about cognitive behavior with the actual physical processes that support such behavior.

As we know, basic science such as biology, medicine, or chemistry is essential in the deep understanding of our mental activity as it supports the evidence that such behaviors are acted out. Taking advantage of modern technology such as artificial intelligence, machine learning, and deep learning we can simulate human behaviors and predict them on their earlier decision-making ability. From these technological and joint operations between IT and neuroscience, there are many questions and answers are being circulated, neuroscience's fame rises more than ever.

Mongolian Neuroscience Society is aimed mental, physical, and social-wellbeing of Mongolians through innovation in research, education, and policy. We promote to educate and discipline our young neuroscientists to contribute to the development of neuroscience. Thus this is important to educating researchers with systematic knowledge of neuroscience and its research techniques.

I heartily hope this school will become a great opportunity to interact scientists and researchers in different fields of neuroscience. I believe that our welcomed attendees would find the benefit of the neuroscience research techniques which will help them to become more efficient, hands-on specialists in the neuroscience field.
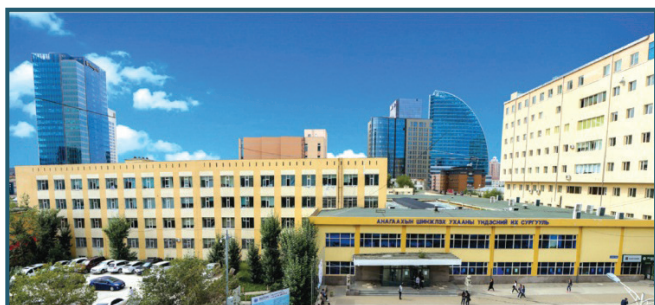
Lastly, I deliver my deepest gratitude to the executives and the members of the IBRO and APRC, and to everyone who made their contribution to organizing this school.

Battuvshin Lkhagvasuren MD., PhD.
President,
Mongolian Neuroscience Society

MONGOLIAN NATIONAL UNIVERSITY OF MEDICAL SCIENCE

The Mongolian National University of Medical Sciences is a gem of an institution that has been a pioneer in medical education in Mongolia. The institution was known as the Mongolian National University of Medical Sciences was founded in 1942 as the Medical Faculty of the Mongolian State University. This marked the beginning of the history of modern medical science and practice in Mongolia.

In 1961, the Medical Faculty became independent of the Mongolian State University and was re-named as the Mongolian State Medical Institute. Soon after the Democratic Revolution of 1989, its mission was broadened, and it was reorganized as the National Medical University of Mongolia (NMUM). In 2003, the NMUM was restructured and organized as a multidisciplinary training and research center called The Health Sciences University of Mongolia (HSUM). On 1 Jun, 2014 our university changed its name from Health Sciences University to Mongolian National University of Medical Sciences.

The University supports excellence and innovation in academic programs, promotes excellence in research, scholarship, and teaching and is committed to attracting and supporting the best students and faculty who excel at teaching and research. With approximately 13,000 alumni who occupy over 90% of the medical professionals in the health care service across the country, the Mongolian National University of Medical Sciences continues to be a leader in providing an environment that empowers physicians and medical professionals to contribute to the development of the society. It has been recognized by the state in so many areas that reflect our commitment to excellence in education and health care.

UNIVERSITY OVERVIEW: MNUMS currently comprises of 11 colleges, 2 research institutions, 3 hospitals, and 2 resorts. Together with 650 faculties, more than 300 staffs.

Over 13,000 degree seeking students are enrolled in the Mongolian National University of Medical Sciences across our eleven schools – the School of Medicine, the School of Biomedicine, the School of Dentistry, the School of Public Health, the School of Nursing, the International School of Mongolian Medicine, the School of Pharmacy, the Graduate School, the Darkhan-Uul Medical School, the Dornogobi Medical School, and the Gobi-Altai Medical School in four different locations including the capital Ulaanbaatar city, Darkhan, Gobi-Altai, and Dornogobi provinces.

We founded Cyber University as the first of the Distance Education Centers in the higher education system of Mongolia in 2015. The main dimensions of education equity in Mongolia are geographical (urban versus rural) and demographic (nomads versus settled population). Overcoming the barriers, any physician or medical professional of all prefectures as well as international students can study online for Master Degree at Cyber University.

To improve the health coverage, we established the Infirmary Center for Students and Faculties that covers annual health check-up, annual dental examination, and vaccinations. Another role of the center is to educate those with up-to-date knowledge on addiction, infectious diseases, stress-related mental disorders, and air-pollution related disorders, so that they could prevent from suffering from such common health issues.

RESEARCH AND INNOVATION: The Mongolian National University of Medical Sciences aims to become a research-based university through world-class research, establishment of advanced research institutes to implement international joint research projects and programs, introduction of advanced technologies, improvement of education-science-production cooperation, promotion of start-up companies and development innovation systems. There are 63 projects, 7 start-up companies and 28 laboratory research productions active within MNUMS. The University Core Laboratory was founded in 2015 with modern research and analysis tools and equipments. With the establishment of cell culture, molecular biology, protein chemistry, pathology and experimental animal laboratories, it has become possible for the academics, teachers and researchers of the university to publish their research and innovation works in prestigious international journals.

INTERNATIONAL EXCHANGE PROGRAMS: MNUMS offers international students' various ways to study, not only as degree-seeking students but also as short-term students such as academic exchange, visiting students as well as internships. A large number of international students in the past have enjoyed studying at Mongolia's most renown medical university and attended various programs including cultural, professional and social activities. Since the first student exchange agreement, MNUMS has signed a large number of academic exchange agreements with institutions all around the world. Such as: Montana State University, USA; Jichi Medical University, Japan; University of Tokushima, Japan; Yonsei University Health System, Korea; Seoul National University, Korea; Irkutsk State Medical University, Russia; Inner Mongolia University for Nationalities, PRC; Khuh Khot Medical University, PRC.

Concluding, in the final words, Mongolian National University of Medical Science is an academically charged progressive environment, having every element desired for the academic and professional excellence

INTERNATIONAL BRAIN RESEARCH ORGANIZATION

HISTORY

The International Brain Research Organization (IBRO) was founded in 1961 in response to the growing demand from neuroscientists in many countries for the creation of a central organization that would cut across world boundaries and improve communication and collaboration among brain researchers.

The origin of IBRO can be traced back to a meeting of electroencephalographers in London in 1947, which led to the establishment of an International Federation of EEG and Clinical Neurophysiology. At a conference of this group and others in Moscow in 1958, there was unanimous support for a resolution proposing the creation of an International Organization representing brain research worldwide.

IBRO was established as an independent, non-governmental organization, regulated by a Governing Council, which is now made up of over 80 neuroscience societies. The organization represents the interests of more than 75,000 neuroscientists around the globe.

MISSION

IBRO (the International Brain Research Organization) is a union of neuroscience organizations with the aim to promote and support neuroscience training and collaborative research around the world. More than 80 international, national and regional scientific organizations constitute IBRO's Governing Council, which together with the six IBRO Regional Committees launch the educational programs that reach young neuroscientists in need of support and assistance. In addition, IBRO has partnerships with like-minded federations of scientific societies to identify priorities and help bridge gaps in knowledge, investment and resources in the field of the brain and related diseases, from development to aging.

THE MISSION OF IBRO IS TO:

- Develop, support, coordinate and promote scientific research in all fields concerning the brain;

- Promote international collaboration and interchange of scientific information on brain research throughout the world;

- Provide for and assist in education and dissemination of information relating to brain research by all available

Mongolian Neuroscience Society (MNS) is an academic non-profit organization, founded in 2014 in Ulaanbaatar, which is aimed to develop neuroscience in Mongolia and represent this field of science abroad.

The society's mission is to enhance mental, physical, and social well-being of Mongolian people through innovations in research, education, and policy by:

- Providing a platform for interdisciplinary interactions to understand nervous systems, including behavior
- Supporting the establishment of collaborative research programs
- Translating advances in neuroscience to enhance mental, physical, and social well-being of the population
- Promote education in the neurosciences to general public to develop teaching concepts that strengthen the personality, collectivism, and creativity of the population
- Promote other activities that will contribute to the development of neuroscience

Research related to personality development spans a wide spectrum of investigation areas, ranging from molecular mechanisms of early brain development, via cellular and systems neurobiology, neurocognition and behavior including personality, to epistemology, logic, and ethics. The society involves numerous scientists, graduated in Japan, Germany, and USA, working in various departments of the Mongolian National University of Medical Sciences (in particular psychiatry, neurology, physiology, and psychology), most of them in close collaboration with the National Center for Mental Health, National Medical Institute, and Academy of Medicine.

Short term-objectives

- Setting up the first Neuroscience Lab with state-of-the art technologies including Live Cell Imaging Technology and Electron Microscopy in Mongolia to study (i) Central circuits of feeding and energy regulation, thermoregulation, and cognition; (ii) the effects of stress; (iii) mechanisms underlying obesity, diabetes, neurological, and psychiatric disorders.
- Completion of validation studies on internationally accepted psychometric tests (CES-D, STAI, SF36, SDQ, WAIS, FFM, TAS20, linguistic methods) and anthropometric tests that enable to facilitate local and collaborative scientific studies in developmental, genetic, clinical, social, and educational fields, provide a research database for social psychology, and enhance clinical early screening activities, nationwide.
- Introduction to new treatment modalities including mindfulness-based CBT with special emphasis on obesity, diabetes, and hypertension.

Long term objectives

- We are aiming to investigate (i) how the neural systems regulate behavior and vary between individuals and ethnicities; (ii) how they change across the life cycle; (iii) why they fail in neurological and psychiatric disorders, and their therapies; (iv) mentality and morality codes of nomadic people of Mongolia.

IBRO-APRC ASSOCIATE SCHOOL ON FUNDAMENTAL TECHNIQUES IN NEUROSCIENCE – THE 4ᵀᴴ ULAANBAATAR SCHOOL

PROGRAM (day by day activities)

IBRO-APRC Associate School on Basic Techniques in Neuroscience – The 4ᵗʰ Ulaanbaatar School 2021 will provide a 6-day program including lectures, technical talks, interactive discussions (neuroethics), and hands-on techniques.

Monday, August 9ᵗʰ, 2021: Registration	
Day 1 : Monday, August 9ᵗʰ	
8:30-09:00	Registration
09:00-9:15	a) Opening ceremony b) School Memorial Photography c) Interactions between school faculties and students
9:15-10:15	Lecture 1: Circuitry mechanisms of energy balance
10:15-10:30	Tea break
10:30-12:30	Tech-talk 1: Cell culture techniques
12:30-13:30	Lunch
13:30-14:45	Tech-talk 2: Stem cell research in Neuroscience
14:45-15:00	Tea break
15:00-16:30	Hands-on session 1: Western blotting / Part 1
Day 2 : Tuesday, August 10ᵗʰ	
9:15-10:15	Lecture 2: Neurogenesis
10:15-10:30	Tea break
10:30-12:30	Tech-talk 3: DNA extracting protocols
12:30-13:30	Lunch
13:30-14:45	Tech-talk 4: Essentials in RT-qPCR
14:45-15:00	Tea break
15:00-16:30	Hands-on session 2: Western Blotting / Part 2
Day 3 : Wednesday, August 11ᵗʰ	
9:15-10:15	Lecture 3: Neuroinflammation
10:15-10:30	Tea break
10:30-12:30	Tech-talk 5:Optogenetics
12:30-13:30	Lunch
13:30-14:45	Tech-talk 6: Immuno-histochemistry
14:45-15:00	Tea beak
15:00-16:30	Hands-on session 3: Perfusion/Cryostat sectioning

Day 4 : Thursday, August 12th

9:15-10:15	Lecture 4: Synaptic plasticity
10:15-10:30	Tea break
10:30-12:30	Tech-talk 7: Stereotaxic ICV injections
12:30-13:30	Lunch
13:30-14:45	Tech-talk 8: Behavioral testing
14:45-15:00	Tea break
15:00-16:30	Hands-on session 4: Microscopy techniques/ Light, Confocal

Day 5 : Friday, August 13th The 8th Annual Meeting of MNS

09:00-9:15	Opening ceremony
9:15-10:15	Keynote lectures
10:15-10:30	Tea break
10:30-12:30	Plenary lectures
12:30-13:30	Lunch
13:30-14:45	Group discussion 1: Oral presentation tutorial
14:45-15:00	Tea break
15:00-16:30	Group discussion 2: Poster presentation tutorial

Day 6 : Saturday, August 14th The 8th Annual Meeting of MNS

9:15-10:15	Symposia
10:15-10:30	Tea break
10:30-12:30	Symposia
12:30-13:30	Lunch
13:30-14:45	Group discussion 3: Neurotics/ Bioethics
14:45-15:00	Tea break
15:00-16:30	Group discussion 4: Case-based journal club

IBRO-APRC ASSOCIATE SCHOOL ON FUNDAMENTAL TECHNIQUES IN NEUROSCIENCE –THE 4ᵀᴴ ULAANBAATAR SCHOOL

FACULTY LIST

Nr.	Name	Position	Affiliation
1	Zhiping P. Pang	Associate Professor/Child Health Institute of New Jersey, Department of Neuroscience and Cell Biology	Rutgers University Robert Wood Johnson Medical School, USA
2	Michael King Hwa Ling	Associate Professor in Genetics and Neurosciences, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences	Universiti Putra, Malaysia
3	Tetsuya Hiramoto	Head, Department of Psychosomatic Medicine	Fukuoka National Hospital, Japan
4	Jong-Cheol Rah	Head, Neurophysiology Lab,	Korea Brain Research Institute, South Korea
5	Battuvshin Lkhagvasuren	President, Mongolian Neuroscience Society	Mongolian National University of Medical Sciences
6	Tserenbat Minjuur	Director, Institute of Medical law	Mongolian National University of Medical Sciences
7	Jambaldorj Jamiyansuren	Lecturer, School of Medicine	International University of Health and Welfare, Narita, Japan
8	Erdenezaya Odkhuu	Lecturer, Department of Anatomy	Mongolian National University of Medical Sciences
9	Zesemdorj Otgon-Uul	Lecturer at Department of Pathophysiology	Mongolian National University of Medical Sciences
10	Khongorzul Batchuluun	Researcher, Lecturer, Department of Histology	Mongolian National University of Medical Sciences
11	Naranbat Nasanbuyan	Postdoctoral fellow, Division Brain and Neurophysiology, Department of Physiology	Jichi Medical University
12	Tsengelmaa Jamiyan	Lecturer, Department of Pathology and Forensic medicine, School of Biomedicine	Mongolian National University of Medical Sciences
13	Ariunaa Sampilvanjil	Lecturer, Department of Histology	Mongolian National University of Medical Sciences
14	Buyankhuu Tuvshintur	Lecturer, Department of Biochemistry	Mongolian National University of Medical Sciences
15	Choinyam Bayarmunkh	Lecturer, Department of Physiology	Mongolian National University of Medical Sciences
16	Chimedlkhamsuren Ganbold	Lecturer, Department of Molecular biology and Genetics, School of Biomedicine	Mongolian National University of Medical Sciences

LECTURES, EXPERIMENTAL TALKS, AND INTERACTIVE DISCUSSIONS

LECTURES AND TECHNICAL TALKS

Lecture 1: Circuitry mechanisms of energy balance (Zhiping P. Pang, Rutgers University Robert Wood Johnson Medical School)
Lecture 2: Neurogenesis (Michael King Hwa LING, Universiti Putra Malaysia)
Lecture 3: Neuroinflammation (Tetsuya Hiramoto, Fukuoka National Hospital, Kyushu University, Japan)
Lecture 4: Synaptic plasticity (Jong-Cheol Rah, Korea Brain Research Institute)
IBRO Lectures: (The 8th Annual Meeting of MNS)

Technical talk 1: Cell culturing (Erdenezaya O, MNUMS)
Technical talk 2: Stem cell research in Neuroscience (Khongorzul B, MNUMS)
Technical talk 3: DNA extracting protocols (Jambaldorj E, MNUMS)
Technical talk 4: Essentials in RT-qPCR (Chimedlkhamsuren G, MNUMS)
Technical talk 5: Optogenetics (Zesemdorj O, MNUMS)
Technical talk 6: Immuno-histochemistry (Ariunaa S, MNUMS)
Technical talk 7: Stereotaxic ICV injections (Naranbat N, Jichi Medical University)
Technical talk 8: Behavioural testing (Naranbat N, Jichi Medical University)

EXPERIMENTAL MODULES

Hands-on session 1: Western Blotting (Erdenezaya O, MNUMS)
Hands-on session 2: Western Blotting (Erdenezaya O, MNUMS)
Hands-on session 3: Perfusion/ Cryostat sectioning (Choinyam B, MNUMS)
Hands-on session 4: Microscopy techniques/ Light, Confocal (Battuvshin L, MNUMS)

GROUP DISCUSSION

Interactive Discussion 1: Oral presentation tutorial (Tsengelmaa J, MNUMS)
Interactive Discussion 2: Poster presentation tutorial (Buyankhuu T, MNUMS)
Interactive Discussion 3: Open discussion on Neuroethics and Bioethics (Tserenbat M, MNUMS)
Interactive Discussion 4: Case based journal club (Battuvshin L, MNUMS)

CHEAH PIKE SEE

Associate Professor
Department of Human Anatomy, Faculty of Medicine &
Health Sciences, Universiti Putra Malaysia, Malaysia

Dr. Cheah is an Anatomist and Neuroscientist with her research focus to identify and to understand the function of causative genes for neurodevelopmental disorders and neuropsychiatric diseases. Her sabbatical training in Massachusetts General Hospital / Harvard Medical School, USA has broadened her research experience in various fields including stroke, cancer biology, gene therapy, and extracellular vesicles.

As an active member of Young Scientist Network-Academy Sciences Malaysia (YSN-ASM) Malaysian Society of Neurosciences (MSN), Asian Pacific Society for Neurochemistry (APSN) and recently as the Chair of the International Brain Research Organization-Asia Pacific Research Committee (IBRO-APRC), she helps to promote collaborative networks between clinical and non-clinical neuroscientists as well as to improve the quality of the neuroscience research in Malaysia and internationally. Dr. Cheah also wishes to materialize the dream of effective translation from bench to bedside and ultimately, to extend her role by reaching out to the society to disseminate knowledge on the relevance of her research for better management and treatment of neurological disorders.
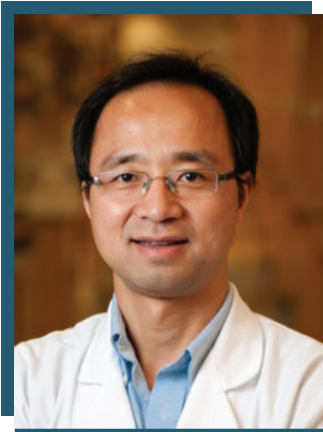
ZHIPING P. PANG

Associate Professor/Child Health Institute of New Jersey, Department of Neuroscience and Cell Biology, Rutgers University Robert Wood Johnson Medical School

Dr. Pang graduated from the Fourth Military Medical University in 1995; received a Ph.D. from the Southwestern Medical Center in 2007; completed postdoctoral training at Stanford University in 2011. He joined the Department of Neurology and Cell Science at Rutgers University as assistant professor at the end of 2011, and he was promoted to tenured Associate professor in 2019. Dr. Pang obtained both his PhD and postdoctoral research training under the tutelage of Nobel Prize winner Thomas Südhof, focusing on the study of the molecular mechanism of calcium triggered synaptic vesicle release. Since 2012, his started to study of the synaptic mechanism of neuropeptides. At the same time, he also made important discoveries in the use of neural stem cells to study neuropsychiatric diseases. His research is supported by a number of grants from the National Institutes of Health, including the most recent BRAIN Initiative Project. He has published a series of important papers in high profile journals including Nature, Science, Neuron, Molecular Psychiatry and other journals. He is also a frequent reviewer for numerous journals and funding agencies.

INVITED LECTURERS

MICHAEL KING HWA LING

Affiliation: Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Position: Associate Professor in Genetics and Neurosciences

Dr. Michael KH Ling is a developmental neurogeneticist and an Associate Professor in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. He has an interest in the field of neurogenetics, genomics, and bioinformatics. He pursued his Ph.D. in Neurogenetics at Professor Hamish Scott's laboratory, University of Adelaide, Australia. He won a Dean's Commendation for An Outstanding Thesis Award and the CCB Award for his doctoral dissertation entitled, "Identification of transcripts involved in differentiation, proliferation and developmental networks of the mouse cerebral cortex". He has published various articles in peer-reviewed journals of high impact factors such as Genome Research, Genome Biology, Cell Reports, Cerebral Cortex, Science Advances and Nature Communications. He has also won various research (UPM R&D Silver Medal, best poster and oral presentations and travel grants) and academic (NSF, MIFRS, AFSI, UPMSTS, ASM-Lindau Foundation, IBRO/ISN Research Fellowship, IBRO and CAEN-ISN Return Home Grants) awards throughout his early career as a neuroscientist. He spent about 4-year as the IBRO/ISN Research Fellow in Professor Bruce Yankner's laboratory at Harvard Medical School, Boston, USA.

Dr. Ling is an active member of the Malaysian Society of Neurosciences and was the past Vice President and Honorary Treasurer of the society. He was also the Malaysian representative to the Governing Council of International Brain Research Organization (IBRO) (2012-2019) and Federation of Asia-Oceania Neuroscience Societies (FAONS) (2012-2017), two sister organizations that oversee the development of neuroscience discipline in the world and Asia pacific regions, respectively. Currently, he is the elected council member of Asia Pacific Neurochemistry Society (APSN) (2020-2024). He is a strong advocate of science outreach programmes in the country via the Young Scientists Network-Academy of Science Malaysia (YSN-ASM) (2012-2021), a prestigious network where he served as one of the protem committee members during its establishment.

TSETSUYA HIRAMOTO

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

BOARD CERTIFICATION
- Board Certified Specialist of the Japanese Society of Internal Medicine
- Board Certified Specialist of the Japanese Society of Psychosomatic Medicine
- Board Certified Specialist of the Japanese Society of Oriental Medicine

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

PUBLICATIONS:

1. 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.

2. 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.

3. 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.

4. 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. Neurogastroenterol Motil. 25:521-8.

5. 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

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 Gastrointesitinal and Liver Physiology.* 303:G1288-95.

7. 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.

8. Hiramoto T, Oka T, Yoshihara K, Kubo C. (2009) Pyrogenic cytokines did not mediate a stress interview-induced hyperthermic response in a patient with psychogenic fever: a case report.*Psychosomatic Medicine* 71:932-936.

9. Hiramoto T, Chida Y, Sonoda J, Yoshihara K, Sudo N, Kubo C. (2008) The hepatic vagus nerve attenuates Fas-induced apoptosis in the mouse liver via s7 nicotinic acetylcholine receptor. *Gastroenterology* 134:2122-2131.

INVITED LECTURERS

JONG-CHEOL RAH

Head/Multi-institutional Collaborative Research Center
for Cortical Processing, Korea Brain Research Institute,
Daegu 41062Daegu, Korea

Dr. Jong-Cheol Rah is the head of the neurophysiology laboratory and leading the Multi-institutional Collaborative Research Center for Cortical Processing at the Korea Brain Research Institute. He received his Ph.D. from the Max-Planck Institute for biophysical chemistry, where he studied synaptic transmission and short-term plasticity with Drs. Christian Rosenmund and Erwin Neher. During postdoctoral training with Dr. John Isaac at the National Institute of Neurological Disorders and Stroke, NIH, he investigated synaptic plasticity and receptor trafficking. He then moved to Janelia Research Campus, HHMI, where he was involved in developing methods for imaging-based large-scale cortical circuit analysis. His current research interest is the circuit mechanism of the short-term memory.

BATTUVSHIN LKHAGVASUREN

President, Mongolian Neuroscience Society

Dr. Lkhagvasuren is a neuroscientist with a research focus on the study of the mechanisms underlying thermoregulation, pain, and fatigue. He is also a licensed psychiatrist with five years of experience in the clinical field. Dr. Lkhagvasuren pursued his Ph.D. in neuroscience at Professor Takakazu Oka's lab, Kyushu University, Japan. For his doctoral work, "Social defeat stress induces hyperthermia through activation of thermoregulatory sympathetic premotor neurons in the medullary raphe region.", he was awarded as a best young researcher, Ikemi Memorial Award, in 2012. He has published a series of papers in top-tier journals including Neuroscience, European Journal of Neuroscience, Frontiers of Neuroanatomy, Psychotherapy & Psychosomatics, and other journals.

He also investigates the epidemiology of brain-related disorders in Mongolian adults while validating valid and reliable screening tools for both the clinical and general population that are internationally accepted, as a part of a multidisciplinary research team.

Dr. Lkhagvasuren is a board member and the current president of the Mongolian Neuroscience Society (MNS). He is also the representative to the Governing Council of International Brain Research Organization (IBRO) and was elected as a member of the Asia – Pacific Region Committee. He wishes to develop brain science research and promote young generations to pursue careers in neuroscience in Mongolia and internationally.

TSERENBAT MINJUUR

Head,
Institute of medical law,
Mongolian National University of Medical Sciences

EDUCATION
- Mongolian National University of Medical Sciences, Associate professor, 2018
- School of Law, National University of Mongolia, Master degree in Law, 2012
- Postdoctoral study, Vienna University, Austria, 2010
- Health Sciences University of Mongolia, PhD in Medicine, 2008
- Medical law courses, Yonsei University, South Korea, 2007
- Forensic DNA typing, Nagoya University, Japan, 2006

EMPLOYMENT RECORD
- Lecturer, Health Sciences University of Mongolia 2004-2012
- Head of Department Forensic medicine, National Institute of Forensic Science, Ministry of Justice 2013-2014
- Senior Lecturer, Mongolian National University of Medical Sciences 2014-2019
- Director, Institute of Medical law, Mongolian National University of Medical Sciences 2019-

MEMBERSHIP IN PROFESSIONAL ASSOCIATION
- Chairman, Ethics committee, Ministry of Health
- Member of Mongolian Bar Association
- President, Law education &Health center of Mongolia
- Director, Institute of Medical law, MNUMS
- Executive director, Law and Compliance, partnership
- Member of Ethics committee, Mongolian National University of Medical Sciences
- Member of IRB, Mongolian National University of Medical Sciences

ADEQUACY FOR THE ASSIGNMENT
Assignments that Best Illustrate Capability to Handle the Assigned Tasks
1. Legal consultant, *Legal assistance*, Assistance in all the legal matters and advise in legal documentation, negotiations, contracts, 2014
2. Lecturer, *Forensic medicine courses*, Development of local capacity in Forensic medicine, 2014
3. Lecturer, *Health sciences courses*, Development of local capacity in health science, 2004
4. Legal consultant, *Vitamin D in TB Prevention in School Age*, *Assessment of health problems, 2015*

Legal consultant, *Reform of the Social Health Insurance*, Development of services and management strengthening, 2012

JAMBALDORJ JAMIYANSUREN

Lecturer, School of medicine
International University of Health and Welfare, Narita, Japan

EDUCATION
- 2013, PhD in Medicine, Department of Neurology, Division of Molecular Biology, Institute of Health Biosciences, The University of Tokushima
- 2005, Residency in Laboratory Medicine, Postgraduate Institute, Health Sciences University of Mongolia,
- 2003, Medical Doctor, School of Medicine, Health Sciences University of Mongolia
- 1997, Chemistry technologist, School of Young Inventors, Ulaanbaatar, Mongolia

EMPLOYMENT
- 2021 – present, Assistant professor, Department of Biochemistry, School of Medicine, International University of Health and Welfare, Narita, Japan
- 2020 – 2021, Associate professor, Department of Molecular biology and Genetics, School of Biomedicine, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia
- 2013 – 2019, Lecture, Department of Molecular biology and Genetics, School of Biomedicine, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia
- 2010 – 2012, Associate researcher, Yamagata University, Yamagata, Japan
- 2004 – 2006, Junior researcher, Central Scientific Research laboratory, Institute of Medical Sciences, Ulaanbaatar, Mongolia

MEMBERSHIP
- Board member, Mongolian Neuroscience Society
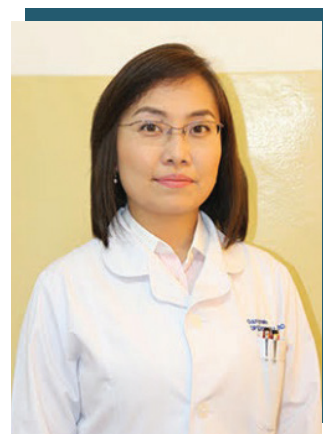- Board member, Human genetics Committee of Ministry of Health, Mongolia

PROJECTS AND RESEARCH
- Genomics of epilepsy, COPD
- Oligonucleotide synthesis
- SARS-Cov-2 diagnostic kit development
- Transcriptional factor study

ERDENEZAYA ODKHUU

Senior lecturer, Department of Anatomy,
School of Biomedicine,
Mongolian National University of Medical Sciences

EDUCATION AND QUALIFICATION
2010.04   PhD, Aichi Medical University, Nagakute, Aichi, Nagakute, Japan
2007.06   MS, Health Sciences University of Mongolia, Ulaanbaatar
2005.06   MD, Health Sciences University of Mongolia, Ulaanbaatar

AWARD:
2019   Publication award, MNUMS
2015   "Best researcher of 2005" Alumni award
2012   "Nan'en" scholarship award for foreign researchers, Aichi Medical University
2008   Grant for Foreign Researchers of Aichi Medical University

PROFESSIONAL SERVICES:
2015 - Secretariat, Mongolian Society for Human Anatomy
2005 -2015   Member, Mongolian Association of Anatomists

LEADING RESEARCH PROJECT
2020-   Molecular mechanism of effect on RANKL-induced osteoclastogenesis by salidroside from *Rhodiola rosea*, The Foundation of Science and Technology Development, MNUMS
2014-2015   The study of B cell development and differentiation, "AiKeiKai" Foundation, Aichi Medical University

LABORATORY EXPERIENCE
- Cell culture
- Protein analysis
- Molecular biology
- Animal laboratory
- Virology

MAIN PUBLICATIONS
1. Odkhuu E, Komatsu T, Koide N, Naiki Y, Takeuchi K, Tanaka Y, Tsolmongyn B, Jambalganiin U, Morita N, Yoshida T, Gotoh B, Yokochi T. Sendai virus C protein limits NO production in infected RAW264.7 macrophages. Innate Immun. 2018 Sep 6 epub.
2. Odkhuu E, Mendjargal A, Koide N, Naiki Y, Komatsu T, Yokochi T. Lipopolysaccharide downregulates the expression of p53 through activation of MDM2 and enhances activation of nuclear factor-kappa B. Immunobiology. 2015 Jan;220(1):136-41. PubMed PMID: 25172547.
3. Odkhuu E, Koide N, Tsolmongyn B, Jambalganiin U, Naiki Y, Komatsu T, Yoshida T, Yokochi T. Involvement of redox balance in in vitro osteoclast formation of RAW 2647 macrophage cells in response to LPS. Innate Immun. 2015 Feb;21(2):194-202. PubMed PMID: 24595208.

ZESEMDORJ OTGON-UUL

Lecturer, Department of Pathophysiology, School of BioMedicine, Mongolian National University of Medical Sciences

EDUCATION

- 2008 - BS in Biomedical Engineering, Health Sciences University of Mongolia
- 2010 - Residency for Laboratory Medicine, Health Sciences University of Mongolia
- 2012 - M.S., Department of Pathophysiology, Health Sciences University of Mongolia
- 2017 - Ph.D., Division of Integrative Physiology, Department of Physiology, Jichi Medical University School of Medicine

AWARD

- 2018 One of the chosen for the Lindau Nobel Laureate Meeting
- Research Encouragement Award 2016, this grant is given by Jichi Medical University for graduate student with excellent research projects.
- 2013-2017 Awarded with fully funded scholarship based on outstanding academic excellence, Japan

SOCIETY AND

- 2017 - ...Member of The Mongolian Neuroscience Society
- 2017-… Member of Mongolian Young Scientist's Association
- 2019-… Leader of Mongolian Assocition of Medical Young Researchers

PUBLICATIONS

1. Otgon-Uul Z, Suyama S, Onodera H, Yada T, Optogenetic activation of leptin- and glucose- regulated GABAergic neurons in dorsomedial hypothalamus promotes food intake via inhibitory synaptic transmission to paraventricular nucleus of hypothalamus Molecular Metabolism 5(8):709-715, 2016.
2. Kumari P, Nakata M, Zhang BY, Otgon-Uul Z, Yada T, GLP-1 receptor agonist liraglutide exerts central action to induce β-cell proliferation through medulla to vagal pathway in mice. Biochem Biophys Res Commun. 2018 May 15;499(3):618-625. 2018
3. Putra Santoso, Masanori Nakata, Kazuhiro Shiizakai, Zhang Boyang, Kumari Parmila, Zesemdorj Otgon Uul, Koshi Hashimoto, Tetsuro Satoh, Masatomo Mori, Makoto Kuro-o and Toshihiko Yada Fibroblast growth factor 21, assisted by elevated glucose, activates paraventricular nucleus NUCB/Nesfatin-1 neurons to produce satiety under fed satates Nature Scientific Reports 2017; 7: 45819
4. Suyama S, Kodaira-Hirano M, Otgon-Uul Z, Ueta Y, Nakata M, Yada T: Fasted/fed states regulate postsynaptic hub protein DYNLL2 and glutamatergic transmission in oxytocin neurons in the hypothalamic paraventricular nucleus. Neuropeptides 56: 115-123. 2016,

KHONGORZUL BATCHULUUN

Researcher, Lecturer, Department of Histology
Mongolian National University of Medical Sciences

EDUCATION AND QUALIFICATION

2017   Ph.D., Histology and Cell biology, Jichi Medical University, Japan
2013   M.S., Histology and Immunology, Health Sciences University of Mongolia
2013   Residency for Laboratory Medicine, Health Sciences University of Mongolia
2010   BS in Biomedical Engineering, Health Sciences University of Mongolia

AWARD:

2018 "Leading Young Scientist", Mongolian President's Prestigious Award
2018 One of the chosen for the Lindau Nobel Laureate Meeting
2015 Medical Oral Presentation Program, Jichi Medical University
2015 Graduate Student Best Presentation Award, Jichi Medical University
2015 Best Poster Award, Jichi Medical University
2015 Research Award Grant, Jichi Medical University
2015-2017 Recipient of Iizuka Takeshi Scholarship
2013-2017 Awarded with fully funded scholarship based on outstanding academic excellence, Japan
2010 Winner of Discovery-2010, Under the Patronage of President of Mongolia, 3rd year
     National Forum of Mongolian Medical Students
2010 3rd place, Khurel Togoot-2010, National Forum of Mongolian Medicine
2007-2008 The Best Student of the Year, School of Bio-Medicine, Health Sciences University of Mongolia
2007-2008 Scholarship from Yonsei Friendship Hospital & University, Korea

MAIN PUBLICATIONS

1. Azuma M, Tsukada T, Inagaki T, Casmad F, Jindatip D, Tofrizal A, Maliza R, Batchuluun K, Syaidah R, Ohno N, Fujiwara K, Kikuchi M, Yashiro T., Immunohistochemical Study of the Laminin α5 Chain and Its Specific Receptor, Basal Cell Adhesion Molecule (BCAM), in both Fetal and Adult Rat Pituitary Glands. Acta Histochem. Cytochem. 51:145–152, 2018

2. Batchuluun K, Azuma M, Yashiro T, Kikuchi M., Notch Signaling and Maintenance of SOX2 Expression within the Rat Anterior Pituitary Cells. Acta Histochem. Cytochem.50: 63–69, 2017

3. Batchuluun K, Azuma M, Yashiro T, Kikuchi M., Notch signaling-mediated cell-to-cell interaction is dependent on E-cadherin adhesion in adult rat anterior pituitary. Cell and Tissue Res. 368:125–133, 2017

4. Azuma M, Tofrizal A, Maliza R, Batchuluun K, Ramadhani D, Syaidah R, Tsukada T, Fujiwara K, Kikuchi M, Horiguchi K, Yashiro T., Maintenance of the extracellular matrix in rat anterior pituitary gland: Identification of cells expressing tissue inhibitors of metalloproteinases. Acta Histochem. Cytochem. 48:185-92, 2015

NARANBAT NASANBUYAN

Postdoctoral fellow, Division Brain and Neurophysiology, Department of Physiology, Jichi Medical University

EDUCATION AND TRAINING

Medical doctor	2003-2009	Mongolian National University of Medical Sciences, Mongolia
Neurologist	2010-2012	Mongolian National University of Medical Sciences, Mongolia
PhD in Medicine	2013-2017	Jichi Medical University, Japan
		Theme: Roles of Oxytocin-Oxytocin Receptor systems in Physiological Responses to Social Defeat stress
		Supervisor: Tatsushi Onaka MD., PhD.

WORKING EXPERIENCE

Instructor	2010-2011	Graduate training center, Mongolian National University of Medical Sciences, Mongolia
Assistant lecturer	2011-2013	Department of Neurology, Mongolian National University of Medical Sciences, Mongolia
Postdoctoral fellow and Visiting Researcher	2017-	Division of Brain and Neurophysiology, Department physiology, Jichi Medical University, Japan

PROFESSIONAL MEMBERSHIP

- Mongolian Neurology Society
- Japan Neuroscience Society

PEER REVIEWED PUBLICATION

1. Naranbat Nasanbuyan, Masahide Yoshida, Yuki Takayanagi, Ayumu Inutsuka, Katsuhiko Nishimori, Akihiro Yamanaka, Tatsushi Onaka. Oxytocin-oxytocin receptor systems facilitate social defeat posture in male mice. Endocrinology. Vol. 159 No. 2, pp.763-775, (Feb, 2018)
2. Naoki Usui, Masahide Yoshida, Yuki Takayanagi, Naranbat Nasanbuyan, Ayumu Inutsuka, Hiroshi Kurosu, Hiroaki Mizukami, Yoshiyuki Mori, Makoto Kuro-o, Tatsushi Onaka. Roles of fibroblast growth factor 21 in the control of depression-1 like behaviors after social defeat stress in male rodents. Journal of Neuroendocrinology (in publication).

AWARDS AND HONORS

- Start-up funding for Young researchers. Jichi Medical University, 2015
- Research award. Jichi Medical University, 2016
- Honorary scholarship for foreign students. Japanese Ministry of Education, Culture, Sports, Sciences and Technology, 2016
- Honorary scholarship for international postdoctoral fellow. Kanehara foundation, 2018
- Full scholarship for Asian researchers. Tokyo Biomedical Research Foundation, 2019

TSENGELMAA JAMIYAN

Lecturer, Department of Pathology and Forensic medicine,
School of Biomedicine, Mongolian National University of
Medical Sciences

EDUCATION

- 2021 Ph.D. Department of Diagnostic pathology, Dokkyo Medical University
- 2017 Cytopathologist, Department of Pathology and Forensic Medicine Mongolian National University of Medical Sciences
- 2014 Pathologist, Department of Pathology and Forensic Medicine, Mongolian National University of Medical Sciences
- 2014 Sc. M. Mongolian National University of Medical Sciences
- 2011 MD Health Sciences University of Mongolia, Ulaanbaatar

AWARD

- 2021 – Best of Breast Cancer Award, Japanese Breast Cancer society

PUBLICATIONS

1. Tsengelmaa Jamiyan, Hajime Kuroda, Rin Yamaguchi, Akihito Abe, Mitsuhiro Hayashi. CD68- and CD163-positive tumor-associated macrophages in triple negative cancer of the breast. Virchows Archiv. 2020 Dec;477(6):767-775. doi: 10.1007/s00428-020-02855-z.

2. Tsengelmaa Jamiyan, Hajime Kuroda, Mitsuhiro Hayashi, Akihito Abe, Ken Shimizu, Yasuo Imai. Ductal carcinoma in situ of the breast with osteoclast-like giant cells: A case report with immunohistochemical analysis. Human pathology: case reports. Case report 20 (2020) 200383. https://doi.org/10.1016/j.ehpc.2020.200383

3. Hajime Kuroda, Tsengelmaa Jamiyan, Rin Yamaguchi, Akinari Kakumoto, Akihito Abe, Oi Harada, Bayarmaa Enkhbat, Atsuko Masunaga. Prognostic value of tumor-infiltrating B lymphocytes and plasma cells in triple-negative breast cancer. Breast Cancer. 2021 Feb 25. doi: 10.1007/s12282-021-01227-y.

4. Hajime Kuroda, Tsengelmaa Jamiyan, Rin Yamaguchi, Akinari Kakumoto, Akihito Abe, Oi Harada, Atsuko Masunaga. Tumor-infiltrating B cells and T cells correlate with postoperative prognosis in triple-negative carcinoma of the breast. BMC Cancer. 2021 Mar 16;21(1):286. doi: 10.1186/s12885-021-08009-x.

5. Hajime Kuroda, Tsengelmaa Jamiyan, Rin Yamaguchi, Akinari Kakumoto, Akihito Abe, Oi Harada, Atsuko Masunaga. Tumor microenvironment in triple-negative breast cancer: the correlation of tumor-associated macrophages and tumor-infiltrating lymphocytes. Clin Transl Oncol. 2021 Jun 5. doi: 10.1007/s12094-021-02652-3.

6. Atsuko Takada-Owada, Yumi Nozawa, Masato Onozaki, Shuhei Noda, Tsengelmaa Jamiyan, Yuumi Tokura, Yoshimasa Nakazato, Takao Kamai, Kazuyuki Ishida. Plasmacytoid urothelial carcinoma of renal pelvis with positive zinc finger E-box-binding homeobox 1: a case report. Diagn Pathol. 2020 Oct 8;15(1):124. doi: 10.1186/s13000-020-01043-6.

7. Takao Kamai, Satoru Higashi, Satoshi Murakami, Kyoko Arai, Takashi Namatame, Toshiki Kijima, Hideyuki Abe, Tsengelmaa Jamiyan, Kazuyuki Ishida, Hiromichi Shirataki. Single nucleotide variants of succinate dehydrogenase A (SDHA) gene in renal cell carcinoma. Cancer Sci. 2021 May 20. doi: 10.1111/cas.14977. Online ahead of print.

ARIUNAA SAMPILVANJIL

Lecturer, Department of Histology, School of Biomedicine,
Mongolian National University of Medical Sciences

EDUCATION

- Medical Doctor: School of Medicine, Mongolian National University of Medical Sciences,(1999-2008)
- Master of Science: Department of Cell Biology and Anatomy, College of Medicine, National Cheng Kung University, Tainan, Taiwan (2010-2012)
- General Oncologist: National Cancer Center of Mongolia (2013-2015)
- PhD in Medicine, Division of Inflammation Research, Center for Molecular Medicine, Jichi Medical University, Tochigi, Japan (2017-2021)

AWARDS

1. 2019. Startup Research Award, Graduate School of Medicine, Jichi Medical University
2. 2020. Research Encouragement Award, Graduate School of Medicine, Jichi Medical University

PUBLICATION

1. Pao-Yen Lin, Yeng-Ting Wu, Guan-Cheng Lin, Yao Hsiang Shih, Ariunaa Sampilvanjil, Linh-Ren Chen, Yu-Jen Yang, Hua-Lin Wu, Meei Jyh Jiang. Coarctation-induced degenerative abdominal aortic aneurysm in a porcine model. J Vasc Surg 2013;57:806- 15.
2. Ariunaa Sampilvanjil, Tadayoshi Karasawa, Naoya Yamada, Takanori Komada, Tsunehito Higashi, Chintogtokh Baatarjav, Sachiko Watanabe, Ryo Kamata, Nobuhiko Ohno, Masafumi Takahashi. Cigarette Smoke Extract Induces Ferroptosis in Vascular Smooth Muscle Cells. Am J Physiol Heart Circ Physiol 318: H508–H518, 2020
3. Naoya Yamada, Tadayoshi Karasawa , Hiroaki Kimura, Sachiko Watanabe , Takanori Komada, Ryo Kamata, Ariunaa Sampilvanjil , Junya Ito, Kiyotaka Nakagawa, Hiroshi Kuwata, Shuntaro Hara, Koichi Mizuta, Yasunaru Sakuma, Naohiro Sata and Masafumi Takahashi. Ferroptosis driven by radical oxidation of n-6 polyunsaturated fatty acids mediates acetaminophen-induced acute liver failure. Cell Death and Disease: Volume 11, Article number: 144 (2020)
4. Fumiya Anzai, Tadayoshi Karasawa, Takanori Komada, Naoya Yamada, Yutaka Miura, Ariunaa Sampilvanjil, Chintogtokh Baatarjav, Kenta Fujimura, Takayoshi Matsumura, Kenji Tago, Hiroshi Kurosu, Yasuchika Takeishi, Makoto Kuro-O and Masafumi Takahashi. Calciprotein Particles Induce IL-1-mediated Inflammation through NLRP3 Inflammasome-Dependent and –Independent Mechanisms. ImmunoHorizons 2021, 5(7) 602-614

BUYANKHUU TUVSHINTUR

Lecturer, Department of biochemistry, School of Biomedicine, Mongolian National University of Medical Sciences
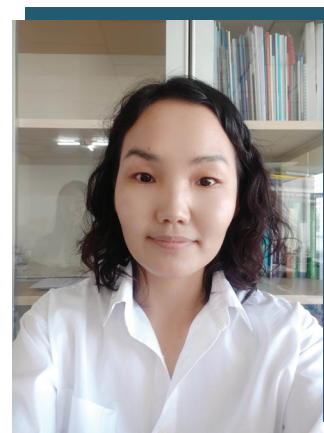
EDUCATION
- 2016-2019   PhD Tianjin Medical University, China
- Thesis: The observation of pancreatic islets of type 2 diabetes patients and the study of diabetes causing KCNJ11 mutation on insulin secretion of beta cells
- 2011-2013   Residency / Laboratory Medicine training/, Health Sciences University of Mongolia
- 2008-2010   M.Sc./Master of Science in Medicine, Medical School of Inha University of Republic Korea
- Master thesis: Differential expression of apelin and its receptor APJ in the corpus cavernosum tissue of vasculogenic erectile dysfunction
- 2002-2007   B.Sc./Bachelor of Science, Bio-Medical technologist, School of Biomedicine, Health Sciences University of Mongolia

PROFESSIONAL SKILLS
- *Biochemistry and Molecular biology* DNA, RNA and protein extraction, PCR, RT-PCR, agarose gel electrophoresis, enzyme digestion, western blotting,
- *Cell culture* culturing and treatment for cell culture, CRISPR-CAS9 technology, siRNA technology
- *Immunology* ELISA
- *Bacteriology* Aerobic bacterial culture, antibiotic susceptibly testing by disk diffusion
- *Histology* Immunohistochemical staining, Immunofluorescence staining, Immunocytochemical staining, other staining for histology

AWARDS
2016-2019 Chinese Government Scholarship, China
2008-2010 BK 21 Scholarship, Republic Korea

RESEARCH PROJECT AND GRANT
- 2020-2021 Principal Investigator for Project Supported by Mongolian National University of Medical Sciences "Association of KCNJ11 rs5219 gene polymorphism with type 2 diabetes mellitus in Mongolians"
- 2010-2012 Implementer Supported by Asian Research Center and Korean Foundation for Advanced Studies "The study of androgen receptor gene CAG and GGN polymorphism in relation with androgenic level in Mongolians"
- 2010 Principal Investigator for Grant Supported by Yonsei University Medical project "Determine the relation between the androgen receptor level and androgens level on hypogonadism rate among aging man"

CHOINYAM BAYARMUNKH

Lecturer, Department of Basic Medical Sciences, School of Nursing, Mongolian National University of Medical Sciences

EDUCATION AND QUALIFICATIONS:
- 2016 Master of Science, Department of Physiology, School of Biomedicine, Mongolian National University of Medical Sciences, Mongolia
- 2013 Medical Doctor, School of Medicine, Health Science University of Mongolia, Mongolia

PUBLICATIONS:
1. Youngeun Hong, Hyunji Lee, Quangdon Tran, Choinyam Bayarmunkh, Damdindorj Boldbaatar, So HeeKwon, Jongsun Park; Jisoo Park "*Beneficial effects of Diplectria barbata(Wall. Ex C. B. Clarke) Franken et Roosextract on aging and antioxidants in vitroand in vivo Toxicological Research*"2021, DOI: 10.1007/s43188-020-00064-z
2. Choinyam.B, Batgerel.O, Munkhbaatar.D, Hyunji Lee, Jongsun Park, Damdindorj.D "Studied of *PHD FINGER PROTEIN 20* expression on adults with obesity" Journal of Health Sciences, Mongolia 2020 (01)
3. Choinyam.B, Munkhsoyol.E, Sevjidmaa.B, Damdindorj.B "Determining the health perception of obesity and the comparative stress level among adults" 83-я ВСЕРОССИЙСКАЯ, Байкальская научно-практическая Конференция, Иркутска 2019
4. Choinyam B, et al, "Effect of day time nap on visual discrimination tasks" Multidisciplinary Brain Science-2020 International Academic Conference.
5. Choinyam.B, Byambasuren.D, Sukhbat.G 'Cardiologist's cardiovascular and respiratory stunt indicators' Journal of Health Sciences, Mongolia 2016 (01) p. 23-25
6. Choinyam.B, Byambasuren.D, Sukhbat.G 'Dynamics of Some Predictive Hemodynamics of Meditation Practitioners' Academic Assembly-57 Comparison of Pharmaceuticals and Bio-Medical Sectors 2015 p-34
7. Choinyam.B, Baasantseren.T, Byambasuren.D, Sukhbat.G "Effect of respiratory and cardiovascular system on meditation" 83-я ВСЕРОССИЙСКАЯ, Байкальская научно-практическая Конференция, Иркутска 2016, р-151,152
8. Choinyam.B, Byambasuren.D, Sukhbat.G, Damdindorj.B "Attentional change and meditation" Multidisciplinary Brain Science 2018, p-68

RESEARCH EXPERIENCE AND SKILLS:
- Since 2013 Membership, Mongolian Physiology Society
- Since 2013 Membership, Mongolian Neuroscience Society
- Since 2013 Membership, Mongolian Neurology Society
- Since 2013 Lecturer, Department of Basic Medical Sciences,Mongolian National University of Medical Sciences

CHIMEDLKHAMSUREN GANBOLD

Lecturer, Department of Molecular biology and Genetics, School of Biomedicine, Mongolian National University of Medical Sciences
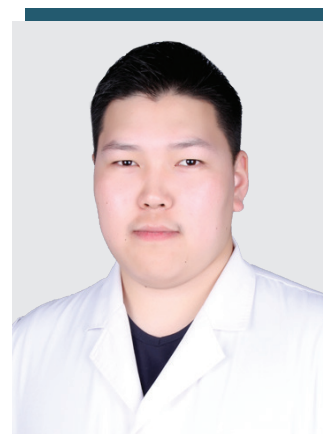
EDUCATION AND QUALIFICATIONS:
- 2016 Master of Medical Science (MSc) in Medicine, Mongolian National University of Medical Science, Mongolia
- 2015 Biomedical Specialist, Molecular biology (Bachelor), Mongolian National University of Medical Science, Mongolia

PROJECTS:
- 2020-2021. "To create and develop a novel PCR test kit for SARS-CoV-2 detection from saliva". Financed by Ministry of Education and Science (Mongolia)
- 2020-2021. "Genetic variations and genetics of the disease susceptibility among Mongolian population". The Foundation of Science and Technology Development, Mongolian National University of Medical Sciences
- 2020-2021. "Investigation of thyroid eye disease-associated biomarkers". The Foundation of Science and Technology Development, Mongolian National University of Medical Sciences
- 2016-2017. "Technology of Molecular biological diagnostic molecule synthesis: Primer" The Foundation of Science and Technology Development, Mongolian National University of Medical Sciences. Co-Financed by Ministry of Education and Science (Mongolia)

PUBLICATIONS:
1. Chimedlkhamsuren Ganbold, Jambaldorj Jamyansuren, Odonchimeg Puntsag, Ochbadrakh Batjargal, Ichinnorov Dashtseren, Sarantuya Jav. *ADRB2* and *ACE* gene polymorphisms in COPD susceptibility. *Centr Asian J Med Scien* 2016:2(2) p127-133
2. Javzandulam Balt, Baasankhuu Jamyanjav, Sarantuya Jav, Zulgerel Dandii, Chimedlkhamsuren Ganbold, Yukihiro Horie, Anton Lennikov, Osamu Uehara, Shigeaki Ohno, Nobuyoshi Kitaichi. Clinical features of Behcet's disease in Mongolia: a multicenter study. *Clin Rheumatol.* 2020 Mar 10. doi: 10.1007/s10067-020-05019-1.
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4ᵗʰ IBRO-APRC ULAANBAATAR ASSOCIATE SCHOOL ON FUNDAMENTAL TECHNIQUES IN NEUROSCIENCE
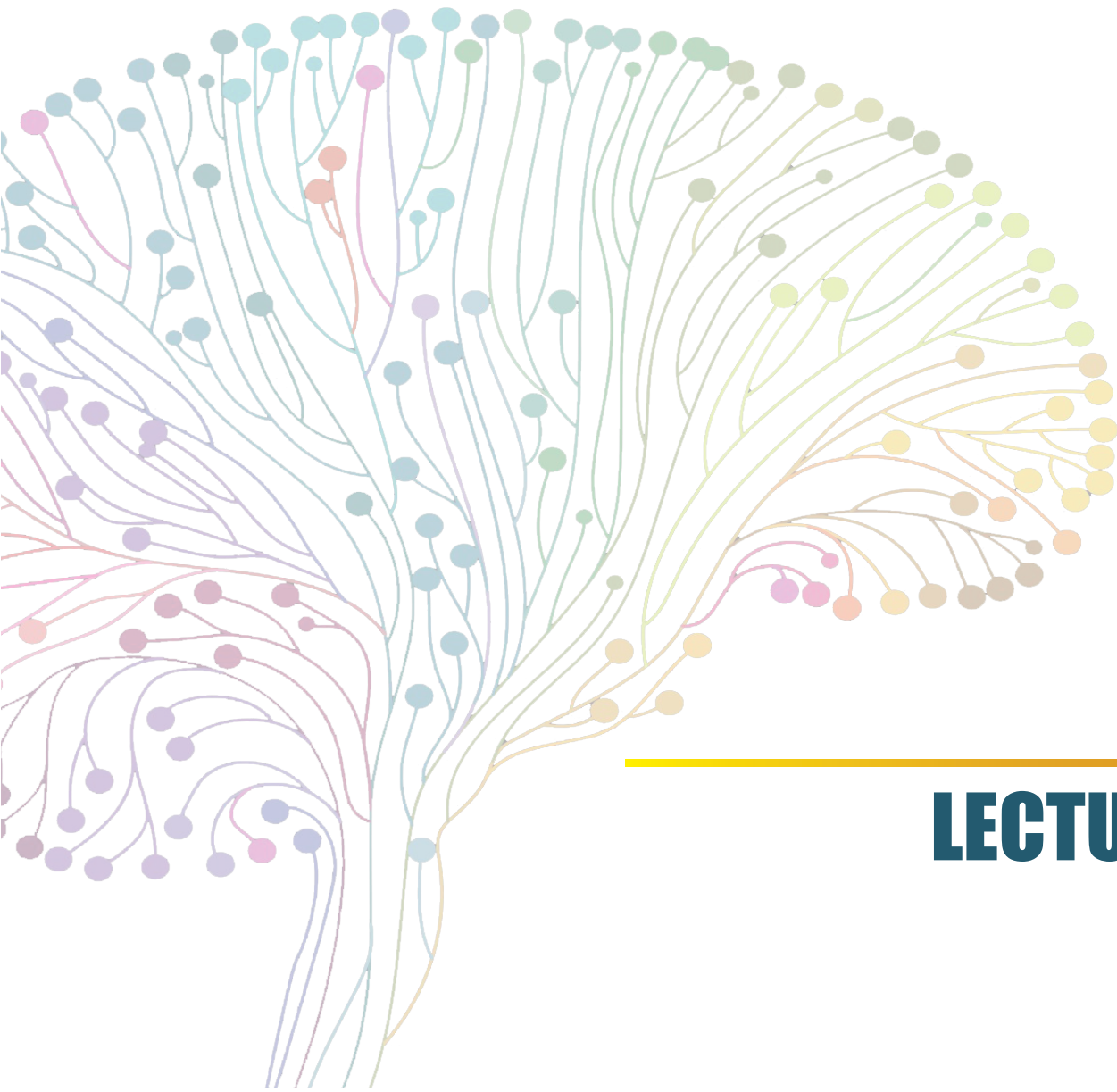
LECTURES

SYNAPTIC AND CIRCUITRY MECHANISM OF CENTRAL CONTROL OF ENERGY HOMEOSTASIS

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Dysfunctional synaptic regulation leads to commonly occurring neuropsychiatric and metabolic impairments, including eating disorders, obesity and diabetes. Synaptic transmission is exquisitely regulated by neuromodulators such as monoamines and neuropeptides.

Glucagon-like peptide 1 (GLP-1) is encoded by the *Gcg* gene and secreted by a distinct population of neurons located within the Nucleus Tractus Solitarius in the central nervous system. While numerous studies have shown that GLP-1 reduces food intake and lowers hyperglycemia, the synaptic mechanisms of GLP-1 action in the brain are poorly understood.

Using multidisciplinary methodology, we delineated the mechanisms of synaptic regulation by endogenously released GLP-1 in the hypothalamus-brain stem neural circuitry, which plays a preeminent role in controlling energy balance by regulating food intake and glucose homeostasis. Using circuit mapping and synaptic physiology, we recently uncovered novel cellular and synaptic mechanisms present in a subpopulation of the neurons located in the paraventricular hypothalamic nucleus (PVN). We showed that GLP-1 receptor (GLP-1R) activation enhances excitatory synaptic strength in PVN neurons by promoting membrane trafficking of glutamatergic receptor subunits; activation of GLP-1R signaling within the PVN is sufficient to suppress food consumption; and that ablation of GLP-1R causes overeating and obesity.

Our systematic approach to elucidate GLP-1 functions in a cell type- and pathway-specific manner will provide a conceptual understanding of synaptic regulation, behavioral, and metabolic impacts of neuropeptides in the brain. If successful, generated results will shed new light on the potential for endogenous neuropeptides to be used in interventional strategies to combat eating disorders, obesity, and diabetes.

DEVELOPMENT OF THE CENTRAL NERVOUS SYSTEM

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The lecture will provide an overview of the central nervous system (CNS) development starting from the process of neurulation to understand the origin of the major component of CNS followed by cell proliferation events to control the pool of neural stem cells, differentiation process that involved fate-determination and finally the neuronal cell migration process.

ONE SYMPTOM, TWO ORIGIN; THE ROLE OF AUTONOMIC NERVOUS SYSTEM IN FEVER AND COUGH

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Autonomic nervous system is related to the initiation and control of symptom(s). Every symptom is caused by the information from peripheral organ(s) and the input information is assessed by the brain, output information (brain's command) is sent to each organ, and then we recognize symptom-(s).

In this lecture, I would like to explain how the autonomic nervous system does participate in the initiation and control of symptoms especially fever and cough, including the role of the system in the regulation of inflammation.

Besides, I would like to explain there are two different origins in one symptom. When the quality of input information is different, the brain and body reactions become different one. For example, when we see symptom such as fever (the body reaction), if the quality input information is different, the pathophysiology of causing fever is different one.

Why we need to think this matter? The reason is that when the pathophysiology of causing fever is different, the way of treatment will be completely different. In order to choose correct treatment, we need to know there are two origins (pathophysiology) in one symptom.

In this lecture, I show first about the role of autonomic nervous system in controlling inflammation, and second the role of the systems in symptoms of fever and cough.

ACETYLCHOLINE SWITCHES THE FREQUENCY-DEPENDENT ACTIVITY FILTERING OF THALAMOFRONTAL SYNAPSES

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Persistent neural activity in the prefrontal cortex (PFC) has been broadly accepted as the physiological substrate of short-term memory. The reciprocal excitation of the mediodorsal nucleus of the thalamus (MD) and the PFC has been suggested as one of the candidate circuit mechanisms to support the persistent activity in PFC. The MD-to-PFC connection is critical to maintaining the persistent high-frequency activity in the PFC and even a transient disruption of the connection disguises the persistent activity and short-term memory. On the other hand, thalamocortical synapses, including MD-to-PFC connection, show strong short-term depression. How does the constant requirement of the MD-to-PFC synapses cope with the rapidly depressing thalamocortical synapses during a high-frequency activity? In the current study, we ought to find the missing link of the apparent paradox. Indeed, we observed that the thalamofrontal synapses depress so strongly that the consecutive high-frequency activities in MD failed to be transferred to mPFC in the basal condition. In contrast, high-frequency activity was transferred to PFC with drastically greater success rate in the presence of the acetylcholine receptor agonist. We attribute the increased reliability of the connection to the muscarinic acetylcholine receptor (mAChR)-dependent increase in the excitability of the excitatory neurons in the PFC. Subsequently, we found that the inactivation of mAChR in the PFC reduces the short-term memory performance as severely as the inactivation of the PFC, suggesting that the short-term dynamics of the thalamofrontal synapses function as a gate for the maintenance of the activity loop between MD-and-PFC and acetylcholine turns the activity loop sustained, thus the short-term memory.

CELL CULTURE TECHNIQUE

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The cell culture technique is the most used and essential basic tool of biosciences.

There are several types of cell culture techniques based on cells origin as microbial, plant, animal. However, the term "cell culture technique" usually refers to animal cell cultures.

National Center for Biotechnology Information simply defined that cell culture technique is methods for maintaining or growing cells in vitro. Broadly, it is the method that enables the growth of cells under a controlled environment in physiological or pathological conditions.

Its origin can be found in the late 19th century when it was introduced to study tissue growth and maturation, virus biology and vaccine development, the role of genes in disease and health, and the use of large-scale hybrid cell lines to generate biopharmaceuticals.

Animal cell culture technology in today's scenario has become indispensable in the field of life sciences, which provides a basis to study regulation, proliferation, and differentiation and to perform genetic manipulation.

In biomedical research, the use of animal and human cell cultures has become beneficial for diverse applications. It provides indispensable tools for producing many products, including biopharmaceuticals, mABs, and products for gene therapy. In addition, animal cell cultures provide adequate test systems for studying biochemical pathways, intra- and intercellular responses, pathological mechanisms, and virus production or investigate the toxicity of novel drug compounds.

Cell culture technique requires a biosafety laboratory, and special equipment, and a trained person.

This tech-talk describes the development of the cell culture technique, the principle of cell culture, the basic technique of cell culture, as well as its applications as following orders.

1. Development of cell culture technique
   - Brief history
   - Cell-based assay
2. Principle of cell culture
   - Type of in vitro culture
   - Type and stage of cell culture
   - Cell line
   - Morphological types of cultured cell
   - Culture conditions
   - Cell culture laboratory
   - Personal protection equipment
   - Aseptic technique
   - Culture conditions
   - Laboratory waste disposal guide
   - Cell culture lab equipment
3. Essential techniques of animal cell culture
   - Thawing frozen cell
   - Daily maintenance and observation of cell culture
   - Count cell
   - Subculture and passage
   - Freeze and stock cell line
   - Prepare cell culture for further experiments
4. Using cell culture for experimental study
   - Experimental groups and statistics of cell culture
   - Statistics of cell culture
   - Bio-ethics

STEM CELL AND ITS NICHE

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One's life begins from the fertilized egg, development that starts with just 1 cell. This cell divides to produce 2 daughter cells, which further divides into their daughter cells, and so on. There are a great many steps needed to form an adult body, or even a baby. Along the way, lots of different types of cells must be made.

In general, specialized cells can no longer divide. In body Stem cells divide by mitosis to maintain the normal physiological state or to replace lost or damaged specialized cells. In other words, stem cells are the fundamental cells for tissue maintenance. These cells differ from the specialized tissue cells from only 2 properties, which are self-renewal and differentiating into necessary cells. Stem cells in our body could be divided into 2 types, depending on what they can do and where you find them (embryonic and adult stage). Though embryonic stage stem cells are well studied adult stage stem cells are still much unknown. For stem cells to go under mitosis or the balance between self-renewal and differentiation, is controlled by the factors within their microenvironment, known as the stem cell niche.

Adult stem/progenitor cells are committed to replace cells after specific lesion and to supply specific types of cells on physiological demands. As we know anterior pituitary gland there are 5 kinds of hormone producing cells that synthesizes and secretes several hormones and one non-hormone producing cell, called SOX2 and S100b-positive cells, which called folliculo-stellate (FS) cells. Our group previously reported that embryonic progenitor cells of anterior pituitary gland construct homophilic cell aggregates in tissue by expressing E-cadherin, which switches into N-cadherin when differentiate into hormone producing cells. Moreover, self-renewal of the stem/progenitor cell is regulated by Notch signaling, which belongs to the juxtacrine signaling that requires specific cell-to-cell adhesion by E-cadherin. In the present study, we investigated genes that are functionally associated with Notch signaling.

S100b-positive cells were isolated from transgenic rats (S100b-GFP rats) by utilizing FACS and cultured with or without Notch signal inhibitor, DAPT (50 μM). By DNA microarray, we found expression of 108 genes were upregulated and 469 genes were downregulated by DAPT-treatment, including genes of T-cadherin, a unique protein of cadherin family that lacks intercellular domain. When we treated S100b-positive cells with DAPT, the percentage of BrdU-positive cells decreased to about a half. Simultaneously, expression of T-cadherin decreased by the same level. Immunohistochemically, we found that subpopulation of S100b-positive cells was positive for T-cadherin.

LECTURES

DNA EXTRACTION PROTOCOLS

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DNA extraction is basic procedure of molecular biology, thought to be common source of DNA used for numerous experiments from simple (gel electrophoresis) to highly advanced high-throughput techniques such as microarray. In molecular biology, there are three basic steps in a DNA extraction and can be done almost any type of samples.

1. Cells, which contains genomic, mitochondrial and plasmid DNA, need to be collected.

2. Breaking the cell membranes open to expose the DNA along with the cytoplasm within (cell lysis). Lipids from the cell membrane and the nucleus are broken down with detergents and surfactants. Breaking proteins by adding a protease (optional). Breaking RNA by adding an RNase (optional). DNA purification from detergents, proteins, salts and reagents used during cell lysis step. The most commonly used procedures are:

- Ethanol precipitation usually by ice-cold ethanol or isopropanol. Since DNA is insoluble in these alcohols, it will aggregate together, giving a pellet upon centrifugation. Precipitation of DNA is improved by increasing of ionic strength, usually by adding sodium acetate.

- Phenol–chloroform extraction in which phenol denatures proteins in the sample. After centrifugation of the sample, denaturized proteins stay in the organic phase while aqueous phase containing nucleic acid is mixed with the chloroform that removes phenol residues from solution.

- Spin column purification that relies on the fact that the nucleic acids may bind (adsorption) to the solid phase (silica or other) depending on the pH and the salt concentration of the buffer.

3. The solution is treated with concentrated salt solution (saline) to make debris such as broken proteins, lipids and RNA to clump together. Centrifugation of the solution, which separates the clumped cellular debris from the DNA.

Cellular and histone proteins bound to the DNA can be removed either by adding a protease or by having precipitated the proteins with sodium or ammonium acetate, or extracted them with a phenol-chloroform mixture prior to the DNA-precipitation. After isolation, the DNA is dissolved in slightly alkaline buffer, usually in the TE buffer, or in ultra-pure water.

Some of the most common DNA extraction methods include organic extraction, and solid phase extraction. These methods consistently yield isolated DNA, but they differ in both the quality and the quantity of DNA yielded. When selecting a DNA extraction method, there are multiple factors to consider, including cost, time, safety, and risk of contamination.

Organic extraction involves the addition of and incubation in multiple different chemical solutions including a lysis step, a phenol chloroform extraction, an ethanol precipitation, and washing steps. Organic extraction is often used in laboratories because it is cheap, and it yields large quantities of pure DNA. Though it is easy, there are many steps involved, and it takes longer than other methods. It also involves the unfavorable use of the toxic chemicals' phenol and chloroform, and there is an increased risk of contamination due to transferring the DNA between multiple tubes. Several protocols based on organic extraction of DNA were effectively developed decades ago, though improved and more practical versions of these protocols have also been developed and published in the last years.

Solid phase extraction such as using a spin-column based extraction method takes advantage of the fact that DNA binds to silica. The sample containing DNA is added to a column containing a silica gel or silica beads and chaotropic salts. The chaotropic salts disrupt the hydrogen bonding between strands and facilitate binding of the DNA to silica by causing the nucleic acids to become hydrophobic. This exposes the phosphate residues so they are available for adsorption. The DNA binds to the silica, while the rest of the solution is washed out using ethanol to remove chaotropic salts and other unnecessary constituents. The DNA can then be rehydrated with aqueous low salt solutions allowing for elution of the DNA from the beads.

This method yields high-quality, largely double-stranded DNA which can be used for both PCR and RFLP analysis. This procedure can be automated and has a high throughput, although lower than the phenol-chloroform method. This is a one-step method i.e the entire procedure is completed in one tube. This lowers the risk of contamination making it very useful for forensic extraction of DNA.

RT-PCR ANALYSIS

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Real time PCR, also known as quantitative PCR (qPCR) is used to detect, characterize and quantify nucleic acids for numerous applications. As in standard PCR, DNA is amplified by 3 repeating steps: denaturation, annealing and elongation. However, in qPCR, fluorescent labeling enables the collection of data as PCR progresses, calling it "real time".

There are two common type of detection methods available for qPCR. In dye-based qPCR (typically green), fluorescent labeling allows the quantification of the amplified DNA molecules by employing the use of a dsDNA binding dye. During each cycle, the fluorescence is measured. The fluorescence signal increases proportionally to the amount of replicated DNA and hence the DNA is quantified in every cycle. The disadvantages to dye-based qPCR are that only one target can be examined at a time and that the dye will bind to any ds-DNA present in the sample.

In probe-based qPCR, it works by using fluorescently labeled oligonucleotide probes and monitoring the fluorescence after each cycle - the intensity of the signal reflects the amount of DNA amplified and the number of cycles at which the fluorescence is first detected is used to calculate the initial number of DNA molecules in the sample. Many targets can be detected simultaneously in each sample but this requires optimization and design of a target specific probe(s), used in addition to primers. The potential for qPCR applications is huge. Every living things in this planet has a DNA or RNA genome so if you want to detect it you go to PCR.

The majority of diagnostics will be based on qPCR. It is also set to have a big impact on the future development of precision diagnosis. Some PCR is being carried out by automated, robotic, high-throughput systems. But the standardization and quality control for PCR still requires laborious human input. Innovative start-up, diagnostics has come up with a solution, using artificial intelligence (AI). It can be happen within the near future, qPCR machines with AI automatically test and checks it in our home medicine cabinet.

OPTOGENETICS

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Optogenetics is the combination of genetics and optics to control well-defined events within specific cells of living tissue. It includes the discovery and insertion into cells of genes that confer light responsiveness; it also includes the associated technologies for delivering light deep into organisms as complex as freely moving mammals, for targeting light-sensitivity to cells of interest, and for assessing specific readouts, or effects, of this optical control. The field evolved with the need to precisely control neurons and decipher neural circuitry and has made great accomplishments in neuroscience.

Optogenetics technology works in several steps.

1. Special genes from single-celled organisms (e.g., certain algae and bacteria) are adapted for use as tools to study specific behaviours in animals (typically mice). These single genes, known as microbial opsins, produce proteins that function as light-sensitive ion channels or pumps, activating or inhibiting the production of electrical current in cells by directing the movement of charged ions (e.g., protons or chloride ions) across the cell membrane in response to light.

2. Advanced genetics tools are used to target the opsin genes to certain cells. Targeting ensures that the genes' products (opsin proteins) are made only in specific kinds of cells. For example, cells in the brain that are not targeted to receive opsin genes will not produce opsin proteins; thus, the nontargeted brain cells will remain unresponsive to direct light.

3. Advanced optics are used to aim precisely timed pulses of light at specific tissue regions or cells. Ideally, this is performed while the experimental subject carries out a behaviour of interest. The light pulses stimulate the opsin genes, resulting in the production of electrical current in the targeted cells. Depending on the kind of opsin used, the electrical current either activates or inhibits the targeted cells. Researchers can then determine whether specific kinds of electrical activity in cells produce the behaviour of interest and, if so, how.
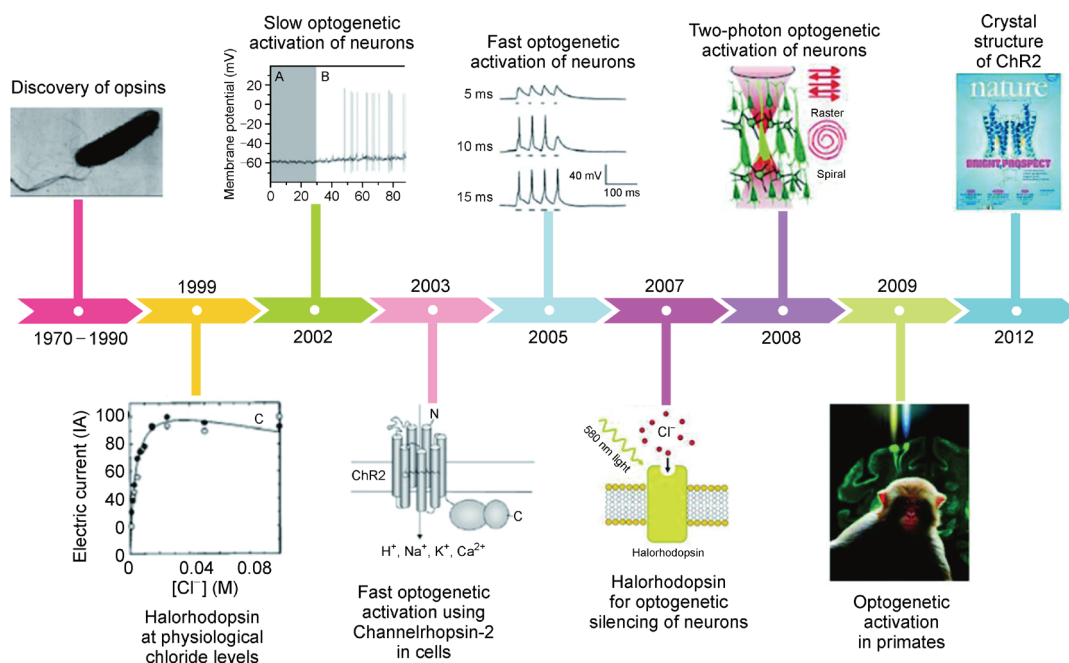
IMMUNOHISTOCHEMISTRY

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Immunohistochemistry (IHC) is a technique for identifying cellular or tissue molecules (antigens) by means of antigen-antibody interactions. The site of antibody binding being identified either by direct labeling of antibody or by use of a secondary labeling method. IHC is an integral technique in many laboratories for diagnostic and research purposes, and has a different application areas such as drug development, molecular biology, and diagnosis. Major changes in the expression pattern of antigen, specific cell, or tissue expression pattern of antigen, tissue or cellular localization of antigen can be determined by IHC. The sequential steps in IHC can be summarized as follows: antigen retrieval, addition of primary antibody, application of a secondary antibody that binds the primary antibody, and addition of a detection reagent to localize the primary antibody.
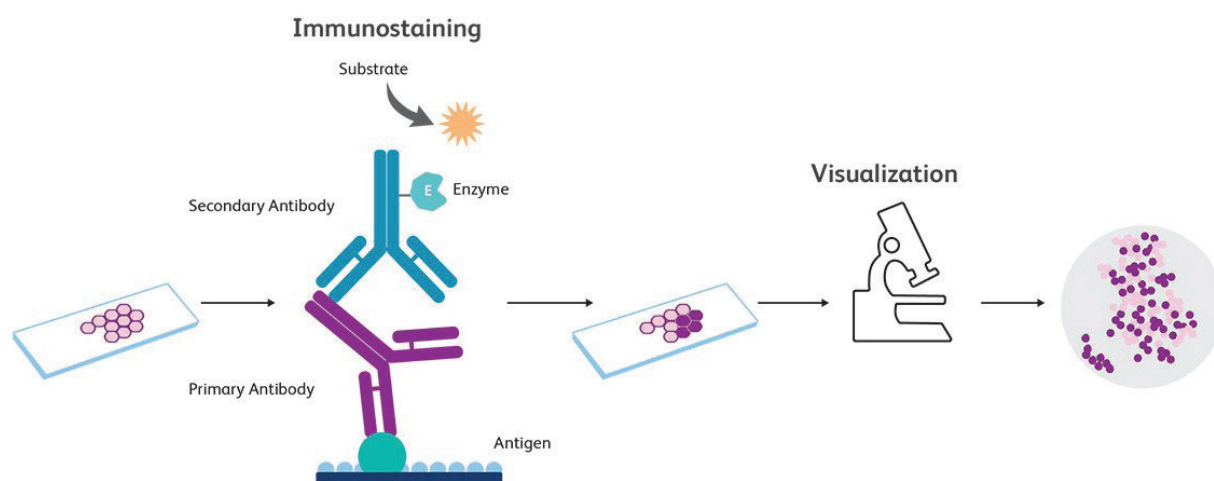
STEREOTAXIC SURGERY/NEURONAL CIRCUIT MANIPULATION

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Structural and functional identification of the nervous system is a core step in understanding the pathological mechanisms of neurological and psychiatric conditions in humans. The mammalian nervous system consists of a highly complex network of synaptic connections that form specific neural circuits.

How can we determine exactly the structure and functions of a particular neural circuit? Stereotactic surgery has been widely applied by neuroscientists to manipulate the brain of living animal. For this purpose, model animals especially rodents such as mice and rats are commonly used. Co-ordination of the stereotaxic surgery is an important basis for accurate targeting the brain region. Researchers are using rodent brain maps as a navigation reference for brain regions.

Stereotactic surgery allows researchers to examine the structural and functional properties of a specific neural circuit by injection of chemical or biological elements into the brain.

To study the structure of specific neural pathways, neuronal cell tracing is used to elucidate the origin of neural circuits and where they project. Depending on the direction of transmission of the neural tracer, it is classified as anterograde (labeling from the cell body to the synaptic terminal) or retrograde (labeling from the synaptic terminal to the cell body).

Functional studies of specific neural circuits in the brain widely use Cre-LoxP or Flp-FRT system technology based on a site-specific recombination mechanism of DNA. Since permanent inhibition or ablation of neurons can induce compensatory changes in neural circuits, so this technique allows researchers spatiotemporal control of neuronal activity. Chemogenetic techniques (such as DREADD) are used to elucidate neural circuits that have certain function in specific behaviors.

BEHAVIORAL STUDY IN RODENTS

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The main aim of neuroscience study is to understand how behaviors arise from the molecular and cellular properties of neurons, the wiring connection characteristics of neural circuits established during a certain period of development, and how it is changed by the experience. While human behavioral studies are performed by self-report or conversation methods, animal behaviors are conducted only by observation.

Although the behavioral study provides much information of preclinical study which may provide an understanding of the clinical condition in humans, the researcher must bear in mind the following points.

The important consideration of behavioral tests is the validity (construct, predictive, and face validity) of the test since if researchers use low validity tests it can be difficult to translate the study results to clinical settings.

Another important consideration is the reproducibility of the experiment outcomes. Standardization of experimental settings increases the reproducibility of the experimental result within the same laboratory and across other laboratories. Depending on external (food access, housing condition, room temperature, and humidity) and internal (sex, age, circadian and seasonal rhythms, hormonal level) factors rodents show different behavioral phenomena. Differences between these factors make influence reproducibility. So it is necessary to implement a standard acclimatization period before each experiment.

Small rodents, such as rats and mice are the most commonly used animal models in behavioral neuroscience studies. Mice and rats are well-fitted model organisms because they display a variety of behaviors that are relevant to the condition of human disease.

In rodents, the following groups of behavioral assays are applied: Basic motor and sensory functions, learning and memory, social behaviors, anxiety- and depression-related behaviors, reward-related behaviors.

HANDS-ON SESSION

IMMUNOBLOTTING

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Immunoblotting (its nick name is western blotting) is a rapid and sensitive assay for the detection and characterization of proteins. They involve identification of protein target via antigen-antibody (or protein-ligand) specific reactions.

Meaning of immunoblotting is that the substance is identified by first immobilizing it by blotting onto a membrane and then tagging it with labeled antibodies. "Western blotting" refers identification of proteins or peptides that have been electrophoretically separated by blot transferring from the electrophoresis gel to strips of nitrocellulose paper, followed by labeling with antibody probes. If using protein-protein interactions for detection it is named as "Far-Western blotting".

Western blotting is a staple experiment in the tool kit of biochemists, molecular biologists, and cell biologists. At the least, western blotting reveals the presence or absence of a protein. But used creatively, this assay can provide a lot of information. Applications of immunoblotting are divided to several kinds.

1. Detecting changes in protein levels across treatment groups,
2. Detecting the post-translational modification of a protein (i.e. phosphorylation, ubiquitination, etc.)
3. Detecting changes in protein levels across time points,
4. Detecting the ratio of truncated to normal isoforms of a protein,
5. Detecting detecting tagged proteins (some proteins are engineered to contain short sequences of amino acids that serve as a tag (for example: the HA-tag and the Myc-tag).

Immunoblotting method consists a several stages, using deferent types of antibodies, and numerous buffer solutions. Also, it takes at least one or two days and required specific equipment, and technical experience.

Firstly, here we discuss about the principle of immunoassay and immunoblotting, it includes immunoglobulins and antibody, antibody in research application, types of immunoblotting.
Next, we explain the main stages of immunoblotting by step by steps as following.

1. Protein sample preparation (measure protein concentration with BCA assay)
2. Protein loading (reduced and denatured condition)
3. Gel electrophoresis (SDS- Poly-acrylamide gel)
4. Blot-transfer to a membrane (wet, semi-dry and dry electroblotting)
5. Blocking nonspecific proteins
6. Label with antibody (1st +2nd) or antibody staining
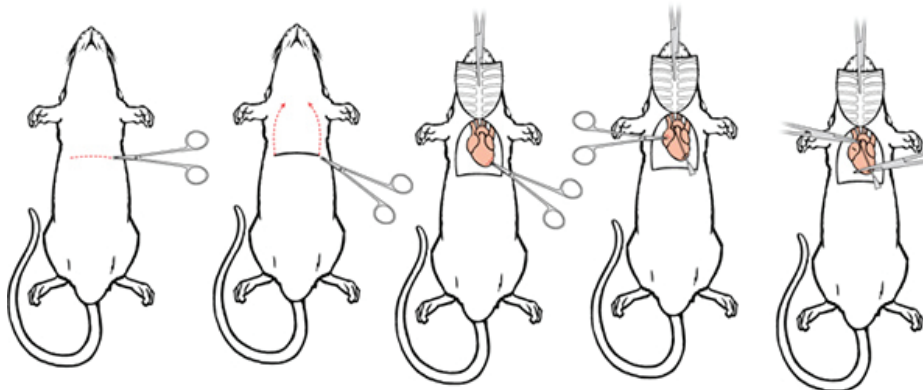7. Detection the labeled target protein or peptide.

PERFUSION OF MOUSE BRAIN

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The goal of fixation is to rapidly and uniformly preserve tissue in a life-like state. While placing tissue directly in fixative works well for small pieces of tissue, larger specimens like the intact brain pose a problem for immersion fixation because the fixative does not reach all regions of the tissue at the same rate. Often, changes in response to hypoxia begin before the tissue can be preserved. The advantage of directly perfusing fixative through the circulatory system is that the chemical can quickly reach every corner of the organism using the natural vascular network. In order to utilize the circulatory system most effectively, care must be taken to match physiological pressures. It is important to note that physiological pressures are dependent on the species used. Techniques for perfusion fixation vary depending on the tissue to be fixed and how the tissue will be processed following fixation. In this video, we describe a low-cost, rapid, controlled and uniform fixation procedure using 4% paraformaldehyde perfused via the vascular system: through the heart of the rat to obtain the best possible preservation of the brain for immunohistochemistry. The main advantage of this technique (vs. gravity-fed systems) is that the circulatory system is utilized most effectively.

1. Using the water bath, warm perfusion buffer to 37 °C. Place outlet valve in a beaker filled with buffer. Fill a 50 ml syringe with buffer and attach to fixative tubing. Flush tubing repeatedly by expelling and withdrawing buffer.

2. Clear the line with buffer until all air bubbles in the tubing are eliminated. It is crucial for the success of a perfusion not to have air bubbles in any of the lines.

3. Remove the syringe and connect the 4% paraformaldehyde fixative (room temperature) container. To avoid air bubbles at the tubing end, squeeze the tube while positioning the tube into the container so that a drop of buffer protrudes from the end to contact the fluid surface within the container.

4. Close the outlet port (needle end). Turn buffer valve (blue) to the same position as the fixative valve (white). This will allow flow from the buffer line only.

5. Open the outlet port and repeat step A1 through A3 for filling the buffer line. After all the air bubbles are eliminated close the outlet port, remove the syringe and connect the buffer container, taking care not to introduce air bubbles into the tubing.

6. Test system for ability to hold pressure

1. Prepare Fixative
(See table Fixative and Buffers.)
2. Prepare Perfusion Buffers
(See table Fixative and Buffers.)
3. Prepare Apparatus and Anesthesia

by pumping the rubber manometer blub. There is normally some resistance due to the compression of air in the system.

7. Setup surgery tools in order for easy of

access. Fill perfusion needle with buffer to eliminate the possibility of air bubbles.

8. Prior to surgery, a ketamine/xylazine mixture (up to 80 mg/kg body weight ketamine and 10 mg/kg body weight xylazine) is administered via intraperitoneal injection (27 gauge needle and 1 cc syringe). Additional administration of anesthetic will be performed as necessary during the course of each operation to maintain a surgical plane of anesthesia.

4. Perfusion Surgery

1. Once the animal has reached a surgical plane of anesthesia, place it on the shallow tray filled with crushed ice. (Use toe pinch-response method to determine depth of anesthesia. Animal must be unresponsive before continuing).

2. Make a 5-6 cm lateral incision through the integument and abdominal wall just beneath the rib cage. Carefully separate the liver from the diaphragm.

3. Make a small incision in the diaphragm using the curved, blunt scissors. The position and pressure of your finger can aid in the ability to cut the diaphragm.

4. Continue the diaphragm incision along the entire length of the rib cage to expose the pleural cavity.

5. Place curved, blunt scissors along one side of the ribs, carefully displacing the lungs, and make a cut through the rib cage up to the collarbone. Make a similar cut on the contralateral side.

6. Lifting the sternum away, carefully trim any tissue connecting it to the heart. Clamp the tip of the sternum with the hemostat and place the hemostat over the head. When done properly, the thymus lifts away from the heart along with the sternum, providing a clear view of the major vessels.

7. Make a small incision to the posterior end of the left ventricle using iris scissors.

8. Pass a 15-gauge blunt- or olive-tipped perfusion needle through the cut ventricle into the ascending aorta. The tip should be visible through the wall of the aorta, and should not reach the aortic arch where the brachial and carotid arteries diverge.

9. Use a hemostat to clamp the heart, this secures the needle and prevents leakage. If desired, the modified hemostat can be used to clamp the aorta around the needle tip (these hemostats remain in place until dissection begins, but are omitted from future illustrations for clarity).

10. Finally, make an incision to the animal's right atrium using iris scissors to create as large an outlet as possible without damaging the descending aorta. At this point the animal is ready to be perfused.

5. Perfusion

1. Open and attach outlet port to needle base taking care not to introduce any air bubbles.

2. Pump up the manometer bulb to a pressure of 80 mm Hg quickly & evenly. Maintain this pressure throughout the buffer infusion period. Start the timer.

3. Adjust the needle angle. The angle of the needle is critical to the achievement of a maximum flow rate (note the flow change with angle adjustment).

4. Switch the buffer valve (blue) once buffer is almost finished (200 ml). The fluid should be running clear. The clearing of the liver is an indicator of a good perfusion. The liver should be clear at this point. Indicate time for your records.

5. Fixation tremors should be observed within seconds; this should be considered the true time of fixation. Indicate time for your records.

6. The pressure can gradually be increase up to a maximum of 130 mm Hg [2] to maintain a steady flow rate.

7. Close the outlet valve once the fixative is nearly finished. Indicate ending time for your records.

8. The rat should be stiff at this stage.

9. The used paraformaldehyde must be collected and stored for disposal according to the regulations of your institution.

6. Dissection

1. Remove the head using a pair of scissors.

2. Make a midline incision along the integument from the neck to the nose and expose the skull.

3. Trim off the remaining neck muscle so that the base of the skull is exposed; remove any residual muscle using scissor or rongeurs.

4. Place the sharp end of a pair of iris scissors into the foramen magnum on one side, carefully sliding the scissors along the inner surface of the skull.

5. Next, make a cut extending to the distal edge of the posterior skull surface. Make an identical cut on the contralateral side. Use the rongeurs to clear away the skull around the cerebellum.

6. Carefully slide the scissors along the inner surface of the skull as the tip travels from the dorsal distal posterior corner to the distal frontal edge of the skull, lifting up on the blade as you are cutting to prevent damage to the brain. Repeat for opposite side.

7. Using rongeurs peel the dorsal surface of the skull away from the brain. Trim away the sides of the skull using rongeurs as well.

8. Using a spatula, sever the olfactory bulbs and nervous connections along the ventral surface of the brain.

9. Gently tease the brain away from the head, trimming any dura that still connects the brain to the skull using iris scissors.

10. Remove the brain and place it in a vial of fixative containing fluid at least 10x the volume of the brain itself. Swirl the vial occasionally.

**7. Post-fixation & Storage**

1. Keep the brain in fixative for 24 hours at 4 °C, swirling occasionally.

2. After 24 hours, wash the brain with phosphate buffered saline by exchanging the media 3 times and swirling each time.

3. Brains can then be stored in phosphate buffered saline or HBHS with sodium azide and kept at 4 °C.

8. Representative Results

An initial indicator of the success of the perfusion is the clearing of extremities such as the nose, ears, and paws and internal organs such as the thymus gland and liver (IHC World). Gross inspection of the brain reveals the blood vessel void of blood (white to pale yellow appearance). This will be also true within tissue sections destine for staining and immunohistochemistry. The final indicator of outcome of the perfusion is the condition of the ultrastructure in the tissue.
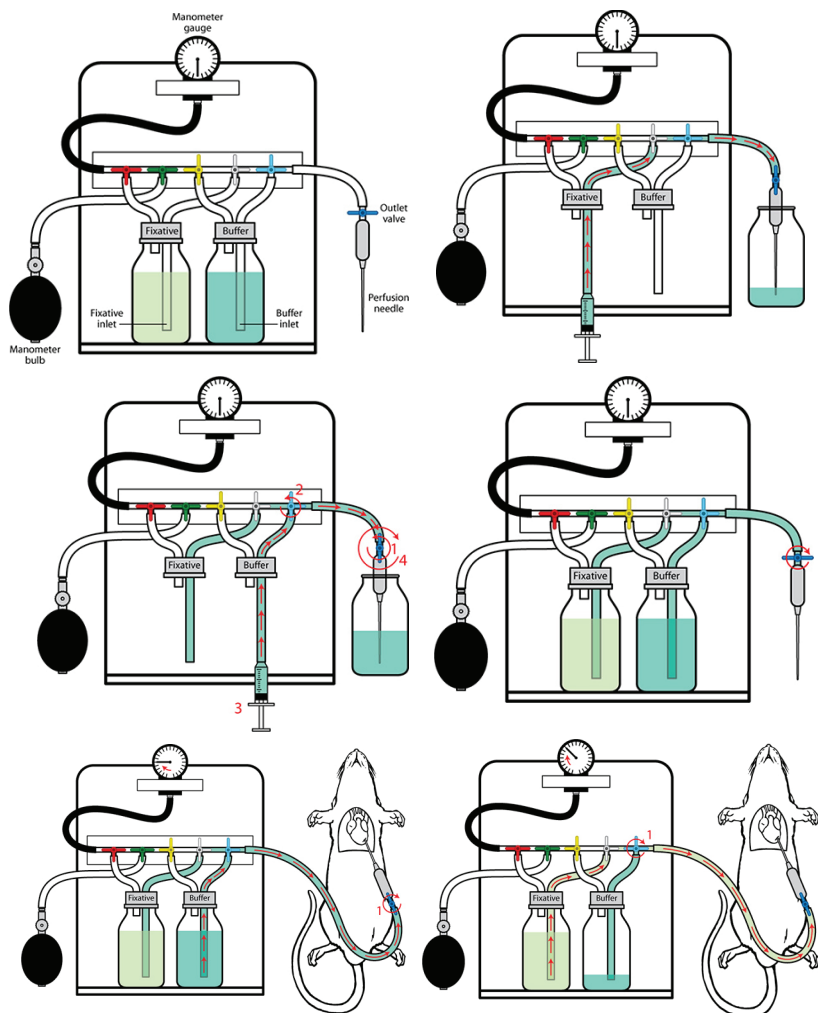
CRYOSTAT SECTIONING OF MICE BRAIN

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This time-saving method reduces variability between rounds of immunohistochemical procedures in neuroscience studies to optimize the visualization of anatomy and local proteins and tissue. The main advantage of this technique is that it reduces the time taken to cryosection and mount brain tissue by combining multiple brains into a single frozen block. While this technique is optimized for coronal sections of rodent brains, it can be adapted to sagittal or transverse sections or different types of tissues such as muscle or liver.

Following successful transcardial perfusion, post-fix the brains from the animals in a 25 milliliter vial of 4%paraformaldehyde in PBS for 24 hours. After this, use blunt tipped forceps to remove the brains from the paraformaldehyde. Transfer the brains to a vial with approximately 20 milliliters of 30%sucrose solution in TBS.

Keep the brains and solution until they sink to the bottom of the vial. Next, place a 500 milliliter glass beaker on a bed of dry ice in an ice bucket. Then pour 300 to 400 milliliters of isopentane into the beaker.

Maintain the isopentane between negative 45 and negative 50 degrees Celsius. On the bench top, fill a disposable embedding mold approximately halfway full with Optimal Cutting Temperature or OCT compound. Use a needle to remove any air bubbles from the mold.

Use the blunt tipped forceps to remove the first brain from the sucrose solution. Then use a new razor blade to remove the cerebellum and olfactory bulbs before separating the hemispheres. Next, give the brains a numeric naming system.

Use blunt forceps, pick up the brain to be placed in position two, and orient it with the side to be cut first facing upwards. Lower the brain into the OCT and use the tweezers to adjust its position until it stands independently. A key modification of this technique is the blank space in position one.

This space is designated to allow easy identification of the megabrain orientation and therefore identify the animal associated with each brain. After all of the brains have been positioned in the mold, add sufficient OCT to cover the tops of the brains, then use a needle to remove any air bubbles. Hold the corner of the mold with forceps ensuring the forceps do not become partially submerged in the OCT.

Then, lower the mold into the isopentane so that the bottom third of the mold is submerged. After 30 seconds, lower the entire mold into the isopentane and release it from the forceps. After three minutes, use the forceps to remove the mold from the isopentane.

Immediately wrap the mold and its contents in aluminum foil and label it appropriately. Transfer the megabrain to a negative 20 degree Celsius freezer for a minimum of 24 hours. First, set the temperature of the cryostat cabinet to negative 19 degrees Celsius.

Remove the megabrain from the freezer and place it in the cryostat. Then place a chuck and two thin tipped paintbrushes in the cryostat. After this, label the slides with the megabrain identification number and slide number and lay the slides on the slide warmer.

Next, unwrap the megabrain and use a razor blade to cut the corners of the mold. Dispense a thin layer of OCT onto the chuck. Then quickly place the megabrain on the chuck.

After the OCT is completely frozen, apply a two millimeter layer of OCT around the sides of the megabrain and allow it to run down the sides onto the chuck. Use a razor blade to remove any excess OCT from the sides and bottom of the chuck. First, position the chuck mounted with the megabrain on the chuck head of the cryostat.

Then set the cryostat to the desired thickness. Trim the OCT and tissue as needed to reach the

desired brain region for tissue collection. Then lower the anti-roll plate until it rests on the stage and turn the cryostat handle to take a single section.

Slowly lift off the anti-roll plate, being careful that the tissue section is not touched. Gently use the paintbrushes to unroll the tissue section until it's lying flat. If needed, hold the OCT flat using the paintbrushes to prevent rolling.

Then remove the slide from the slide warmer and hover the slide label side down over the megabrain section and allow it to stick to the slide. Quickly apply a drop of PBS to the tissue section. Using a fine tipped paintbrush dipped in PBS, brush out any bubbles in the tissue section and unfold the tissue so it is lying flat on the slide.

Finally, place the slide on the slide warmer to dry for 45 minutes and store the slide at negative 80 degrees Celsius. In this protocol, brain tissue from nine animals were prepared and cryosectioned simultaneously. Following cryosectioning, H&E staining can be carried out to assess the cryoprotection quality.

Representative results of ionized calcium binding adapter molecule one or Iba1 staining of microglia show consistent staining between each study brain on a single megabrain. While attempting this procedure, it's important to remember to constantly monitor the temperature while freezing the megabrain to prevent cracking or thawing and then refreezing of the tissue which leads to abnormal tissue integrity. It is not advised to segregate different treatment groups in separate megabrains as this can create variance between groups during staining and reduce bias and subjectivity during imaging and analysis.

Don't forget that working with paraformaldehyde can be extremely hazardous and precautions such as wearing PBE and working in a hood should always be taken while performing this procedure.

Cryostat/ freezing microtome
- Fresh tissue
- Frozen section medium
- Cutting blade
- Brush or anti-roll plate
- Clean glass slides
- A diamond pencil

Procedure:

1. Transfer the frozen tissue block to a cryostat at -20°C and allow the temperature of the frozen tissue block to equilibrate to the temperature of the cryostat.

2. Apply frozen section medium to fix the tissue block to the holder.

3. Fix the tissue block to the arm and adjust the setting to the desired angle and thickness.

4. Attach the tissue sample to a slide approved for immunostaining.

5. Dry the slides at room temperature for one hour before staining, or store at -200C for future use.

Cryostat microtome
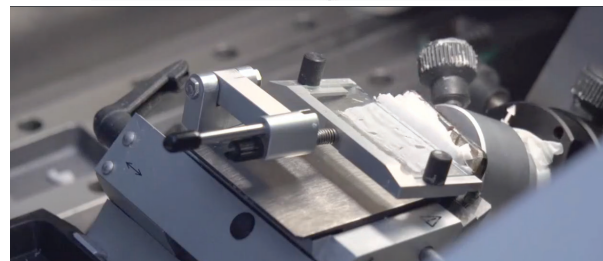
MICROSCOPY TECHNIQUES, LIGHT/CONFOCAL

Battuvshin Lkhagvasuren,
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There are different types of microscopy imaging techniques that are widely used in neuroscience. Conventional wide-field light microscopy uses visible light and a system of lenses to magnify images of small objects. Based on the same but more sophisticated principles, optic microscopy techniques offer several different kinds of modern imaging systems including fluorescent, two-photon excitation, light-sheet fluorescent, confocal, and resonant scanning confocal microscopy, whereas electron microscopy techniques differ in principles which use a beam of accelerated electrons as a source of illumination.

For medical diagnoses or histopathology of tissues, wide-field light microscopy is used extensively. Fluorescence microscopes achieve excellent resolution, contrast, sensitivity, and acquisition speeds which makes them suitable for brain research. More extended applications such as light-sheet fluorescent microscopy or multiphoton fluorescent microcopy allow imaging in living tissue up to one millimeter in thickness. However, in terms of contrast, confocal microscopy techniques use a spatial pinhole to block out-of-focus light in image formation for better optical resolution and contrast. Several different types of confocal microscopes have been developed, each with advantages and disadvantages.

This hands-on talk will cover when you need a light or confocal microscope, what advantages of confocal microscopy over fluorescent microscopy are, and how to prepare samples for both fluorescent and confocal microscopy.
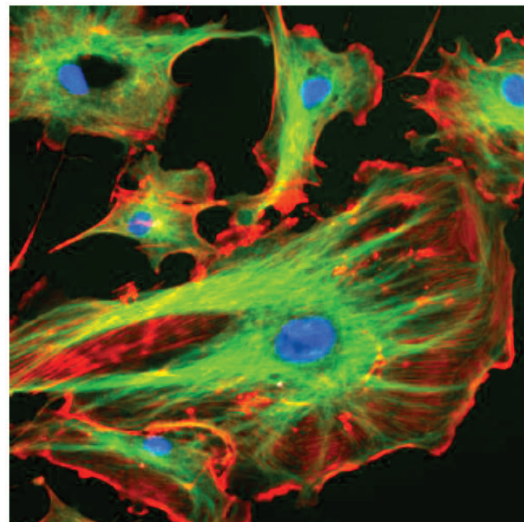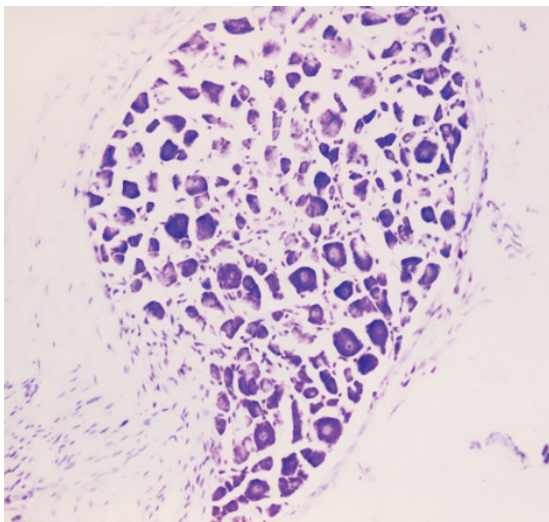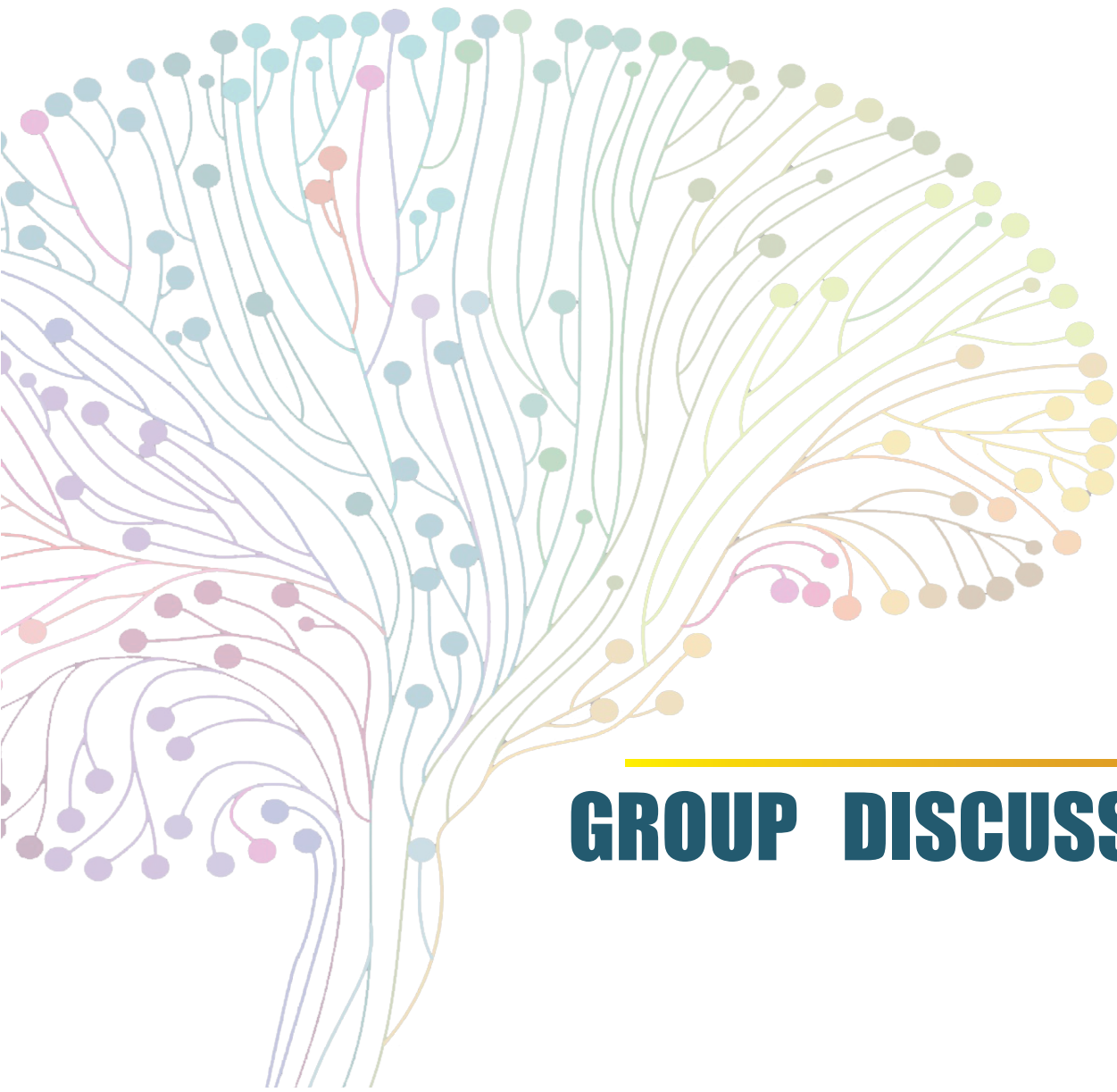
GROUP DISCUSSION

MAKING GOOD ORAL PRESENTATION

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Making excellent oral presentation is one of the important skills for researchers. Before we make a presentation, we should know about some tips and standard. There are three main elements- understanding requirements, organizing information, and preparing for success. Be sure you know who your audience is and deliver what the audience wants to hear. To make a successful presentation, you need to consider the following: presentations and slides.

Common problem with presentations:

- Reading your slides
- Speaking to the screen, not to the audience
- Speaking too softly to be heard
- Speaking in a flat, monotone voice
- Using "um's" and "ah's" to fill pauses in speaking; silence is better
- Presenting too many slides
- Presenting slides too quickly
- Nervous, repetitive movements, such as pulling on your cuffs or pushing your hair out of your eyes

Common problem with slides

- Too much text
- Type or images too small to see
- Poorly aligned or poorly spaced text or images
- Unnecessary words and phrases
- Figures with too much detail
- Poor contrast between text and background

Clear and logical delivery of your research results is a principal component of a successful scientific career.

POSTER PRESENTATION

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Posters are a means of communicating research results or proposals in a concise fashion. Posters are widely used in the academic community and most conferences include poster presentations in their program. Research posters summarize information or research concisely and attractively to help publicize it and generate discussion. The poster should be well organized and concise enough for the viewer to read it in less than 10 minutes.

Poster presentation formats differ from discipline to discipline, but in every case, a poster should clearly articulate what you did, how you did it, why you did it, and what it contributes to your field and the larger field of human knowledge.

The poster is usually a mixture of a brief text mixed with tables, graphs, pictures, and other presentation formats. At a conference, the researcher stands by the poster display while other participants can come and view the presentation and interact with the author.

What goals should I keep in mind as I construct my poster?

1. Clarity of content. You will need to decide on a small number of key points that you want your viewers to take away from your presentation, and you will need to articulate those ideas clearly and concisely.

2. Visual interest and accessibility. You want viewers to notice and take interest in your poster so that they will pause to learn more about your project, and you will need the poster's design to present your research in a way that is easy for those viewers to make easy sense of it.

What makes a good poster?

- Important information should be readable from about 10 feet away
- Title is short and draws interest
- Word count of about 300 to 800 words
- Text is clear and to the point
- Use of bullets, numbering, and headlines make it easy to read
- Effective use of graphics, color and fonts
- Consistent and clean layout
- Includes acknowledgments, your name and institutional affiliation

Resources:

Michigan State University -https://urca.msu.edu/posters

Eastern Kentucky University- http://people.eku.edu/ritchisong/posterpres.html

University of Wisconsin – Madison https://writing.wisc.edu/handbook/assignments/posterpresentations/

BIOETHICAL ISSUES ON NEUROSCIENCES RESEARCHES

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Ethics is a philosophical discipline pertaining to notions of good and bad, right and wrong our moral life in community.

Bioethics is the application of ethics to the field of medicine and healthcare. Ethicists and bioethicists ask relevant questions more than provide sure and certain answers.

Bioethics are multidisciplinary. It blends philosophy, theology, history, and law with medicine, nursing, health policy, and the medical humanities. Insights from various disciplines are brought to bear on the complex interaction of human life, science, and technology. Although its questions are as old as humankind, the origins of bioethics as a field are more recent and difficult to capture in a single view.

When the term "bioethics" was first coined, it may have signified merely the combination of biology and bioscience with humanistic knowledge. However, the field of bioethics now encompasses a full range of concerns, from difficult private decisions made in clinical settings, to controversies surrounding stem cell research, to implications of reproductive technologies, to broader concerns such as international human subject research, to public policy in healthcare, and to the neurosciences researches.

CASE-BASED JOURNAL CLUB

Battuvshin Lkhagvasuren
Mongolian Neuroscience Society, MNUMS

1. Introductory remarks

2. Responsible conduct of research

Case-based discussion using 2-3 excellent supporting materials in the form of peer-reviewed papers/publications.

Doing Global Science, A Guide to Responsible Conduct in the Global Research Enterprise (Princeton University Press, 2016) *http://www.interacademies.org/33345/Doing-Global-Science-A-Guide-to-Responsible-Conduct-in-the- Global-Research-Enterprise* funded through the US Dept. Of Health and Human Services, Office of Research Inetgrity (ORI), Responsible Conduct of Research (RCR) Resource Development Program to James M. DuBois, St. Louis University) *https://ori.hhs.gov/rcr-casebook-stories-about-researchers-worth-discussing*

3. History and important principles for modern neuroethics

Case-based discussion emphasizing the importance of adaptation to diversity of values and cultures. Identify 2-3 excellent general supporting materials in the form of peer-reviewed papers/publications.

What is neuroethics? Neuroethics Questions to Guide Ethical Research in the International Brain Initiatives (Neuron, 2018) Karen S. Rommelfanger, Sung-Jin Jeong, Arisa Ema, Tamami Fukushi, Kiyoto Kasai, Khara M. Ramos, Arleen Salles and Ilina Singh https://globalneuroethicssummit. com/wp-content/uploads/2018/10/NeQN_Neurong2018.pdf

An Ethics Toolbox for Neurotechnology (Neuron, 2015)

Martha J. Farah https://www.cell.com/neuron/fulltext/S0896-6273(15)00262-7

RCR Casebook: Stories about Researchers Worth Discussing

4. Case/theme-based journal club supported by peer-reviewed papers/articles matched to the IBRO school theme

Students can be split into smaller groups so that each group can critically evaluate one assigned paper/article to then share their general assessment with everyone else. Task force members will help the school organiser(s) and facilitators arrange this.
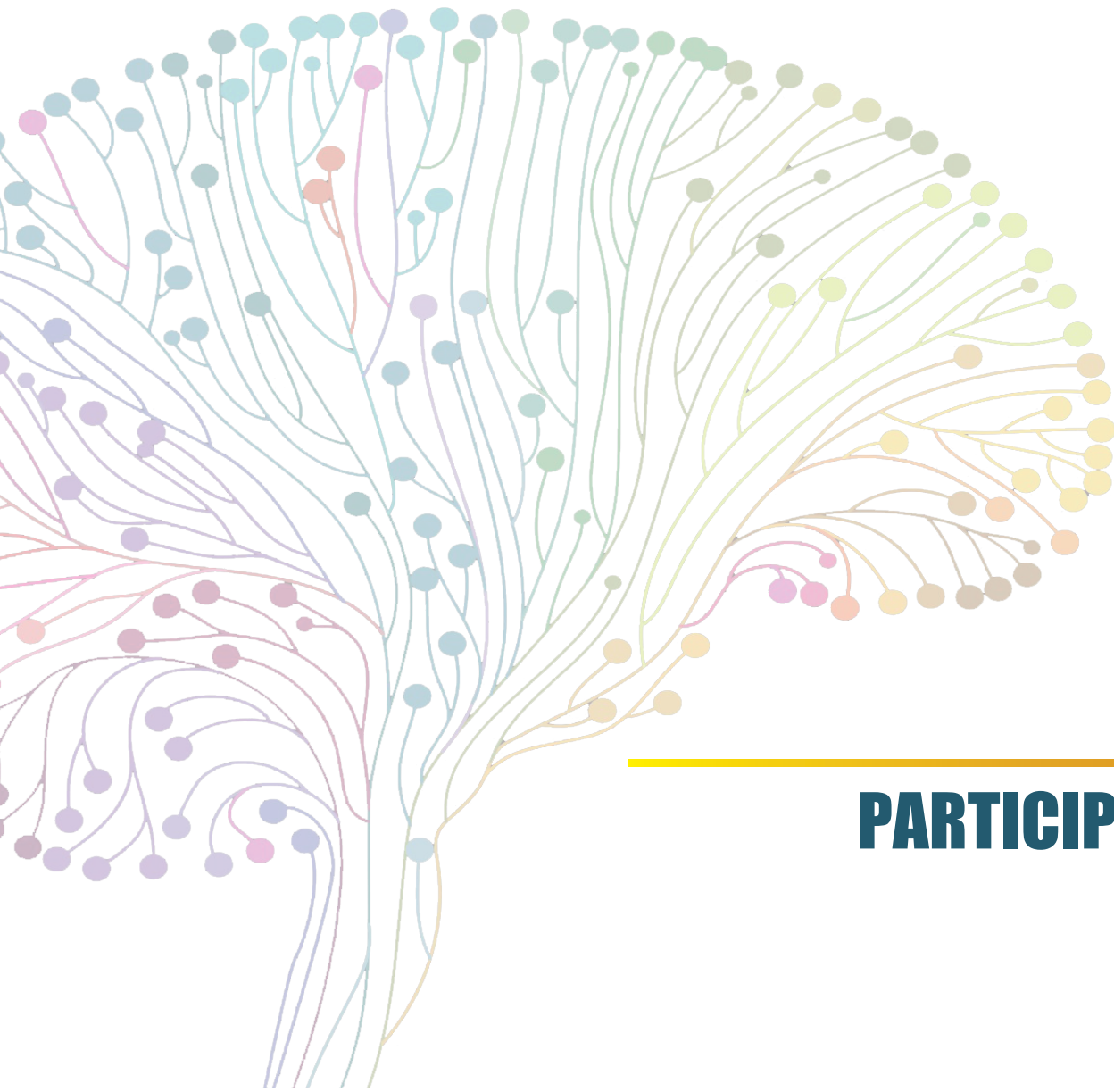
5. Open discussion

6. Evaluation of curriculum by students and facilitator – by the end of the school

4th IBRO-APRC ULAANBAATAR ASSOCIATE SCHOOL ON FUNDAMENTAL TECHNIQUES IN NEUROSCIENCE

PARTICIPANTS

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THE STUDY OF QUALITY OF LIFE AND SOME MENTAL ISSUES IN RELATION TO THE TOUCH EXPERIENCE AND ATTITUDE

In recent years, as technology has advanced, people have spent more time on the Internet using mobile phones and computers than live communication, and the lack of contact with each other has had negative consequences. (Lorié Á, 2017)

British researchers have found that touching or hugging has a positive effect on the human body, and the sense of touch is one of the most important forms of non-verbal communication in social relations. (Olausson H, 2010).

In 2020, a survey of more than 40,000 people in 110 countries around the world by the University of London's Goldsmiths found that more than half did not get enough for life (Claudia Hammond, 2020).

According to the World Health Organization, 60% of FGPs in the world have some form of mental disorder. Cochrane found that poor cognitive experience from an early age or to this day reduced social satisfaction and significantly increased susceptibility to depression (Cochrane 1990). Therefore, it is assumed that the causes of modern mental disorders and disorders such as stress, depression, and insomnia are due to an imbalance of the six factors that make up the sense of touch. The balance of six factors that assess the sense of touch, such as Friends and family touch (FFT), Current intimate touch (CIT) (14 items), Childhood touch (ChT), Attitude to self-care (ASC), Attitude to intimate touch (AIT), Attitude to unfamiliar touch (AUT) has a positive effect on the brain and has a positive effect on mental health can be of great importance in creating. However, creating a positive mental state can increase not only relationships but also quality of life.

Through the study of interpersonal experiences and attitudes in relation to quality of life, it is important to educate people about the balance of interpersonal attitudes, to show that focusing on relationships has a positive psychological effect, and to promote mental health. Therefore, the aim is to study the relationship between quality of life and interpersonal skills and attitudes.

Method & Results: A total of 401 Mongolian adults participated in a cross-sectional online survey. To test our hypotheses, we performed Touch Experience and Attitude Questionnaire, WHOQOL, PSQI, GAD, PHQ using SPSS (26.0). Results revealed that all hypotheses were supported: Quality of life depends on touch experience and attitude, touch experience and attitudes are associated with depression, anxiety and insomnia.

Conclusion: Current intimate of childhood experiences and attitudes are associated with anxiety, depression, and sleep deprivation, and childhood inadequacy is inversely related to anxiety, sleep quality, and depression. This suggests that some mental health problems that begin in childhood may persist into adulthood. The fact that childhood problems are related to current intimacy suggests that future intimate attitudes are determined by how much the child has been touched at an early age.

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Research area: To define the post-immunization responses and to compare with pre-immunization and post-immunization psychological status of the citizens vaccinated against coronavirus infection.
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PSYCHOLOGICAL STATUS AND THE POST-IMMUNIZATION RESPONSE OF THE NCMH STAFF VACCINATED AGAINST CORONAVIRUS INFECTION

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Introduction: Vaccination is the most effective medical intervention for life-saving and is estimated to save at least 2.5 million lives every year. The purpose of this study is to define pre-immunization and post-immunization psychological status and to compare with the post-immunization response of the NCMH staff vaccinated against coronavirus infection.

Material and method: The study design was descriptive and cross-sectional and data were collected using a semi-structured questionnaire.

Results: 43 individuals who participated in the survey, female (n=38; 88.4%), and the average age was 42.9±9.9. The sex ratio was 8:1 and more than 50% of the participants have symptoms of post-vaccination immune response for 3 days after the first dose of the vaccine, including pain in the planted area (76.7%); fatigue (69.8%); restlessness (60.5%); shivering (55.8%), and headache (51.2%). Symptoms of the post-vaccination immune response, such as redness and pain at the injection area, restlessness, shivering, headache, the pain of the joint, and sore throat were statistically significant with the level of pre and post-vaccination depression. There may also be a sub-febrile fever, cough, loss of appetite, diarrhea, lymphadenitis, itchy skin, rash, shortness of breath, and other vegetative signs were significantly depending on the level of the basic anxiety, and the level of post-vaccination anxiety of respondents.

Conclusion: Symptoms of an immune response for 3 days after the first dose of the vaccine against coronavirus include pain, fatigue, restlessness, shivering, and headache reported in more than 50% of the respondents. There were statistically significant differences in somatic morbidity, basic anxiety, pre and post-vaccination depression, and anxiety levels.

Keywords: COVID-19, pandemic, immune, basic anxiety, depression

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"EFFECTS OF GRATITUDE AND HUGGING ON WELL-BEING OF CHILDREN IN AN ORPHANAGE"

Bolorchuluun Gantumur

Aims & Objectives: The study examined the effectiveness of positive psychology methods to support the psychological development of children in Mongolian orphanages. According to several nationwide studies, the mental health of children and adolescents became a growing concern in Mongolia. In particular, factors that negatively affect the psychological development of poor, homeless, and orphaned children who live in residential care settings are many. In other words, their need for psychological support is often greater than children in the general population. Therefore, the study aimed to examine the effects of some positive psychology methods on the well-being of children and adolescents who live in orphanages.

Method & Results: A total of 21 (6-12 years old) children who live in an orphanage participated in the experimental study. Participants were randomly assigned into the gratitude and hug group or control group. Participants in the experimental group performed positive psychological exercises for two weeks. Strengths and difficulties questionnaire (SDQ) and satisfaction with life scale (SWLC) were used for assessing psychological effects of gratitude and hug on participants. All participants answered questionnaires before the study (pre-test), following gratitude study completion (post-gratitude), and following hug study completion (post-hug). To test the hypotheses, we performed the Mann-Whitney U test using GraphPad Prism (9) program. Results of the study showed that hug and gratitude exercises of positive psychology could have a positive effect on the psychological well-being of children in orphanages.

Conclusion: The main findings of the study were: 1) participant's conduct problems, emotional problems, and peer problems were significantly decreased post gratitude; 2) participant's hyperactivity and conduct problems were significantly decreased post hug; 3) participant's pro-social behavior significantly increased both post gratitude and post hug. Results of the study indicated that positive psychological hug and gratitude techniques could have statistically significant positive effects on the well-being of children in residential care. Moreover, the study is the first study that examined positive psychological effects on children in an orphanage in Mongolia. Thus, the study findings can be practically significant to understand some of the behavioral and psychological challenges children in orphanages face. Therefore, care centers and professionals who work with children could use the results of the study as an information resource in interventions aimed at improving children's psychological wellbeing.

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ALUMNI EMPLOYER SATISFACTION SURVEY

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Aims & Objectives: This survey was conducted to determine the satisfaction of alumni employers, to assess the suitability of their skills in the labor market, assess insufficient skills in their employment and improve the quality of training based on employers' expectations.

Determine the level of stakeholder satisfaction that evaluates graduates.

Method & Results: Face-to-face interviews were used to collect employer satisfaction data from the aimags, which were encoded in SPSS 23.0.

For the training activities, the highest level of satisfaction was 4.31, the lowest value was 3.79, and the average value was 4.01, which shows that the satisfaction of the alumni and employers is good. 42.8 percent of health facility managers rated the training program as adequate, 43 percent as moderate, and 14.2 percent was inadequate.

Conclusion: The level of satisfaction of employers who surveyed about the training activities was 4.01, which shows that the satisfaction of co-workers and employers is good. According to the results of qualitative research, medical specialists are needed. In addition to providing students with good theoretical knowledge, there is a need to increase their ability to work in primary health care, to include more internships in the hospital environment, to pay attention to graduates' writing culture and spelling, and to develop soft skills to support personal development.

PARTICIPANTS

65

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GRAPH THEORY FOR ANALYZING BRAIN CONNECTIVITY NETWORKS

Batjargal DOLGORSUREN

Aims & Objectives:

My current research interests are Graph Data Mining in the Real World Networks including brain networks. We consider brain cell connectome as input and estimate the properties of a large graph also finding patterns within those different graphs. Graph mining on brain graph is concerned with estimating properties of graph G, or finding patterns within G, given the usual constraints of the brain model. We aimed to investigate whether interesting characteristic on brain patterns of some abnormal people (e.g., mental disorders, alzheimer's disease, stroke, …) and healthy people. Based on previous studies, we did some experiments on public datasets which represented human brain connectivity patterns from MRI data using some graph analyzing tools and tried to explain brain model.

Method & Results: A total of 1,053 people's brain graph that provide set of nodes (vertices = 83) and links (edges = 725) are used to test our hypotheses, we performed Graph Modeling and analyzing test using Gephi 0.9.2 tool. Experimental results show that averagely 17.4 links are existed, density of brain graph is approximately 0.213; and around 4 neurons are connected sequentially. The left hemisphere of the brain has more connection than right one, it is proved that left side of brain is dominant.

Conclusion: There are practical consequences of the present study findings. First, we had tested and demonstrated brain graph on some tools. It gave us more confidence to do more study. Second, we really wanted to build a new model by testing it with a real brain MRI data of Mongolian people. Existing studies are conducted mainly to their researcher's country people dissimilarity with others. Therefore, we hope that our studies could be important in both neuroscience and computer science.

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THE STUDY ON CORRELATION BETWEEN ATTACHMENT STYLES, AQ AND SOFT SKILLS

Dulguun Batkhurel

Aims & Objectives: The present study examined the relationship between attachment style, adversity quotient, and soft skills. Today's state and time adversity and soft skills are crucial, a study conducted by an international business company (IBM) found that more than 5,670 company executives rated soft skills as a key work factor (David Leaser, 2019). Harvard University's business review also sees the ability to overcome adversity as a new competitive advantage since 2011. From these companies and highly praised schools claiming adversity is the best key factor in the workplace, I've decided to conduct research on comparison between adversity and attachment theory (Okun, 2019). Attachment theory is widely used in companies to oversee psychological differences in workplace, a study conducted by APA in 2013 stated companies executive and work forces can be divided by their psychological differences in workplaces and attachment theory is highly emphasize on personal development of becoming a successful person in the future (Hudson, 2013). A research comparison between attachment theory and soft skill, adversity was not been conducted, And these problems were my main motive to conduct my research on "Comparing attachment stages to adversity and soft skill".

Method & Results: A total of 400 adults were surveyed using questionnaires to determine their stages of attachment behaviour, teamwork and decision-making skills. To test our hypotheses, we performed using SPSS (23.0). Results revealed that all hypotheses were supported:

The study found that interpersonal skills, coping skills, decision-making, and teamwork skills were correlated.

Conclusion: The study found that interpersonal skills, coping skills, decision-making, and teamwork skills were correlated. As a result of the research, it is possible to draw the following conclusions.

1. Soft decision-making and teamwork skills have a positive effect on those who have experienced the love and care of their parents at an early age.
2. Decision-making skills and AQ have a positive effect on those who did not receive adequate support from their caregivers at an early age.
3. Decision-making skills and AQ have a positive effect on those who do not receive enough attention from their parents or caregivers for their physiological needs at an early age.

This suggests that encouraging emotional expression in childhood, and touching and caring in verbal, non-verbal can affect teamwork positively. It is also concluded that how you interact with your child affects their ability to cope and make decisions.

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NONORGANIC SLEEP DISORDERS AND SLEEP QUALITY AMONG THE GENERAL POPULATION OF MONGOLIA: PREVALENCE, PREDICTIVE FACTORS, AND RELATIONSHIP WITH THE PSQI QUESTIONNAIRE

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The aim of this study was to determine the prevalence of nonorganic sleep disorders and sleep quality among the general population using the Pittsburgh Sleep Quality Index (PSQI) followed by a structured psychiatric interview for low sleep quality individuals. This nationwide population-based cross-sectional study was carried out between August and October 2020 and consisted of 964 participants (74% women, mean age: 40.72±14.34) who were randomly selected from 64 clusters in 10 sites of Mongolia. 27.9% of the study participants were evaluated as having nonorganic sleep disorders based on the diagnostic guidelines of the International Classification of Diseases, Tenth Edition, Clinical Modification (ICD-10). The prevalence of nonorganic sleep disorders differed in age (p < 0.001). Nonorganic sleep disorders were related to age, employment, diastolic blood pressure, sleep quality, and quality of life. The mean PSQI total score was 5.61±3.36 and 42.2% of the participants were classified as poor sleepers by a cut-off point of 5. An overall Cronbach's α was 0.73. Both exploratory and confirmatory factor analyses of PSQI indicated a two-factor solution. The results suggest that the prevalence of nonorganic sleep disorders in the general population of Mongolia was 27.9%, while the prevalence rate of the poor sleep quality was 42.2% in the general population. The Mongolian version of the PSQI provides an important tool for screening of sleep quality and demonstrated good construct validity for use in the general population of Mongolia.

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CORRELATION BETWEEN CAREGIVER BURDEN AND SELF-CARE ABILITY OF SCHIZOPHRENIC PATIENTS

Enkh-Uchral P, Khishigsuren Z

Background: Schizophrenia is a chronic mental disorder with symptoms which onset at young age. It is one of the 10 leading serious disorders which has high incidence of disability and caregiver burden. Scholars (Martens, Addington et al.,2009) noted, if one of the family members has a schizophrenia, it is a major stressor for all family. In Mongolia, there are no studies about caregiver burden of mental patients, especially schizophrenia. This is the main reason to undergo this study. To determine correlation among self-care ability of schizophrenic patients, caregiver burden and burnout syndrome.

Material and methodology: In total of 206 study participants were selected randomly from outpatients and their caregivers, who are diagnosed as residual schizophrenia and monitored at NMHC from August 2015 to March 2016. The study design was a cross sectional descriptive model.

Results: In total of 206 people, 73 males and 133 females, who were aged between16 to 83 years participated in this study. The mean age was 45.53 ± 14.16 years. We studied the relationship among self-care ability of schizophrenic patients, caregiver burden and burnout syndrome. The self-care ability of patients has no concerns with the decrease in personal accomplishment and depersonalization, which are the burn out symptoms of caregivers. But there was a significant correlation among self-care ability score of patients, caregiver burden ($r=-0.347**$, $p<0.001$) and emotional exhaustion ($r=-0.313**$, $p<0.002$) score. It means high burden and burn out symptoms of caregivers correlate with low self-care ability of patients.

Conclusion: The major part of the schizophrenic patients (73.8%) has a low self-care ability. 93.2% of the caregivers of schizophrenic patients had a burden and burnout (97.1%).

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EFFECTS OF DOCTORS' WORK STRESS ON DOCTORS' MARITAL SATISFACTIONAND MENTAL HEALTH IN MONGOLIA: PARTNER'S ATTACHMENT STYLE AS A MODERATOR

Enkhzaya Batkhuyag, Xihua Zeng, Xiaoyuan Zhang

The doctors' work stress is increasing in the modern medical field due to the inherent demands of the medical profession and rapid development of technology. The purpose of this study was to investigate the influence of Mongolian doctors' work stress on doctors' marital satisfaction and mental health, and how their partner's attachment styles moderated this relation. In this study212 participants (106 doctors' couples) participated. Six scales were administrated to the doctors: Effort Reward Imbalance scale, Experience in Close Relationship Inventory, Relationship Assessment Scale, and Generalized Anxiety Disorder Assessment‖ scale (GAD-7) and Patient Health Questionnaire (PHQ-9).

Doctors' partners finished the same scales except Effort Reward Imbalance scale. The results indicated that doctors' over-commitment to jobs had a significantly positive impact on doctors' anxiety and depression. Partners' avoidant attachment style was negatively and significantly correlated with doctors' relationship satisfaction, and positively and significantly correlated with anxiety and depression. Contrary to our prediction, partner's attachment style did not moderate the relation of work stress to marital satisfaction as well as mental health.

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PREVALENCE OF ALCOHOL DEPENDENCE IN MONGOLIA: A NATIONWIDE POPULATION-BASED, CROSS-SECTIONAL STUDY

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Alcohol-related problems are a major health issue in Mongolia and remain underdiagnosed. The nationwide population-based, cross-sectional study reported here was carried out between September and November 2013. It aimed to determine the prevalence of alcohol dependence among the general population using two instruments: the Alcohol Use Disorder Identification Test (AUDIT) and an International Classification of Diseases (ICD)-10 based psychiatric interview. The AUDIT test, developed by the World Health Organization, was adopted to screen a full spectrum of alcohol-related disorders. Participants identified at high risk of alcohol dependence were referred to a psychiatric interview for diagnosis of alcohol dependence. The interview was designed using ICD-10 diagnostic criteria. The study consisted of participants from 79 clusters, age 18–64 years ($n = 11746$, males 49.1%, females 50.8%, mean age 39.6 ± 12.5 years). 45.4% of the participants ($n = 5336$) abstained from alcohol use, 39% were at low risk of alcohol dependence ($n = 4582$), 9.2% were at moderate risk ($n = 1075$), and 6.4% were at high risk ($n = 753$). Among the participants at a high risk of alcohol dependence, 522 were diagnosed as alcohol dependent (4.4%) through the psychiatric interview. Increased risk of alcohol dependence was associated with those who were men, divorced or widowed, living in the Central and Mountain regions, young, unemployed, and less educated. These results suggest that the prevalence of alcohol dependence is 4.4% among the general population in Mongolia.

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THE STUDY ON CORRELATION BETWEEN MBTI FUNCTIONS AND CHARACTERISTICS OF ECONOMIC BEHAVIOR

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Aims & Objectives:

This study examines the relationship between adult personality functions, money attitudes, materialism, and compulsive buying through scientifically based empirical research. Compulsive buying and money attitudes are related to self-esteem and depression, and compulsive buying are made to increase self-esteem and improve mood (Hanley & Wilhelm 1992). However, there are many studies on money attitudes, materialism, and compulsive buying, such as the creation of a materialistic family in order to assert one's position in society (Dittmar, 2005), in relation to depression and self-esteem. In particular, there is research on money in Mongolia, but research on compulsive buying and materialism has not been made public. A study of personality traits, including the MBTI, or Myers-Briggs personality trait, has not yet been performed in relation to money attitudes, materialism, and compulsive buying. Therefore, the aim is to examine whether personality traits are related to attitudes toward money, materialism, and compulsive buying.

Method & Results:

The study included 387 adult participants online using a random sampling method and quantified using SPSS 26 software. Results revealed that all hypotheses were supported: Personality traits were associated with money attitudes, materialism, and compulsive buying.

Conclusion:

Research has shown that personality traits influence economic behavior and by understanding the relationship between personality traits, money attitudes, materialism, and compulsive buying, one can learn the strengths and weaknesses of one's economic behavior, and a business can create services tailored to the needs of its customers.

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MEASURING HEALTH-RELATED QUALITY OF LIFE IN PEDIATRIC NEUROLOGY

Health-related quality of life (HRQOL) is central to how clinicians and parents make choices about medical care for pediatric neurology patients. To provide parents with the information they need to make these decisions and plan for the future, it is necessary for parents and clinicians to understand how HRQOL is defined and measured in the setting of pediatric neurodevelopmental impairment. We review challenges that exist in measuring HRQOL in pediatric neurology, examine existing measures, and outline key principles to guide selection and interpretation of HRQOL measures in children with neurologic conditions.

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LONELINESS, DEPRESSION AND ACTIVITIES OF DAILY LIVING IN ELDERLY

Purpose of study

The purpose of this study is to research on impact of depression and loneliness of the elderly on their independence in activities of daily living.

Research Methodology

The research will be conducted with the method of analytic study. It is attended one hundred eighty five elderly aged over 60 in Ulaanbaatar. Permission paper will be collected from the participants and using specially designed survey card to collect data. The survey card includes general information, physical health and case of psychological discomfort in the last 12 months, Beck's Depression Inventory, UCLA Loneliness Scale and Index of activities for daily living

Expected Result

- It is possible to undertake assessment of depression and loneliness in the elderly of Ulaanbaatar and to determine its prevalence. This could be a baseline for the planning and implementation of future care and services to reduce loneliness and depression in the elderly.
- Reduction of depression and loneliness in the elderly will have a positive impact on the reducing its negative impacts of life and self-reliance on the day-to-day life.
- Determining the credibility and validity of questionaries' of depression assessment by Beck and loneliness assessment by UCLA, it will be possible to introduce a new version of our country.

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RELIABILITY AND VALIDITY OF THE MONGOLIAN VERSION OF AFFECTIVE TOUCH QUESTIONNAIRE

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Aims & Objectives: The aim of the study was to construct a Mongolian version of the TEAQ questionnaire originally designed in English to assess attitudes to and experience of affective touch. We translated, and adapted TEAQ for Mongolian language version.

Method & Results: All statistical analyses of the data were conducted using SPSS 26.0 software. We used principal component analysis (PCA) as a factor extraction technique with Varimax rotation (Finch, 2006). After assessing the PCA component structure CFA was performed in AMOS 21.0.0 software using a method of maximum likelihood. The criteria used to determine goodness of model fit were a Root Mean Square Error of Approximation (RMSEA), a Comparative Fit Index (CFI), Relative chi-square (CMIN/DF), and Non-normed fit index NNFI (TLI) (McDonald & Ho, 2002). A total of 278 (mean age=26.9±8.8) participants, 118 (57.8%) were women.

According to the principal component analysis 55-item version, in which the six factors explained 50.30% of the variance, Eigenvalues were ranged between 1.91 and 12.03 and, and the KMO measure was 0.836 with Bartlett's Test of Sphericity significance level (p<0.001). Cronbach's alpha for the complete 55 items was 0.925. CFA was performed for a six-factor model where each item loaded for only one factor, with no consideration for possible loadings for two factors and variances of errors for individual items. This model demonstrated nearly satisfactory fit. The mean TEAQ CIT subscale score was lower in participants single (p<0.001), never married (p<0.001), hadn't any children (p=0.018), and had an education below bachelor's degree (p=0.04). Participants living with parents, relatives, and roommates or alone had lower CIT subscale score compared to other arrangement styles of living (p<0.001). The mean ChT subscale score was deferred amount of children growing in the family (p=0.048), and arrangement styles of living (p=0.002). The mean ASC score was significantly higher for female than for male gender (p<0.001), AUT score was significantly higher for men than in female (p=0.004). As an additional measure of construct validity, we compared the associations of the TEAQ subscales using Pearson's correla-

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tion analyses, in order to test the independent association with quality of life, anxiety, and depression. Physical health, Psychological state, Social relationship, and Environmental domains of WHOQOL-BREF (p<0.01) were positively correlated, anxiety, depression (p< 0.01) were negatively correlated with the CIT subscales score. The ChT subscales score were positively correlated with 3 domains (Psychological state, Social relationship, and Environmental) of the WHOQOL-BREF (p<0.01), and negatively correlated with depression (p=0.05) were negatively correlated with the mean scores of all domains of WHOQOL-BREF. Anxiety was positively correlated with the ASC subscales score. Participant's age was positively correlated with the FFT subscales score (p=0.05), and CIT subscales score (p<0.01). Multiple linear regression analyses found that the FFT subscales score was associated with participants age, AIT subscales score was associated with anxiety, ChT subscales score was associated with amount of children, and ASC subscales score was associated with gender. Marital status, depression, and social relationship domain of WHOQOL-BREF were related to the CIT subscales score. The AUT subscales score was associated with the gender, marital status and years of marriage.

Conclusion: Initial pool of items, after being subject to cultural appropriateness examination and principal component analysis, was reduced to a 55-item questionnaire and a clear six-factor structure. The factors are: Friends and Family Touch (FFT), Current Intimate Touch (CIT), Childhood Touch (ChT), Attitude to Self-Care (ASC), Attitude to Intimate Touch (AIT), and Attitude to Unfamiliar Touch (AUT).

High Cronbach's alpha for the whole scale, sufficient Cronbach's alpha for all the subscales (with relatively low reliability for AUT-subscale) suggested that the questionnaire can be considered a sufficiently reliable measurement tool. The reliability of the 6-factor structure of the TEAQ-55 MNG was confirmed using CFA with a satisfactory model fit on a separate sample. Overall, the results of psychometric analysis of Mongolian TEAQ-55 show that the questionnaire can be used in research practice. Further research is needed to obtain more precise estimates for the influence of social and subcultural backgrounds on touch-related attitudes and behaviour.

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A SURVEY OF PHARMACY STUDENT'S SATISFACTION ON THEIR LEARNING ENVIRONMENT

Shinezaya Dashbaljir, Oyungoo Badamdorj, Davaadagva Damdindorj

Aim: To evaluate and study the level of satisfaction of the School of Pharmacy, MNUMS student's on their learning environment.

Materials and methodology: The survey was conducted using a quantitative research method for an analytical study covering 214 students studying pharmacology in the 2018-2019 academic year. The data was collected using quantitative method, making a quantitative questionnaire cards evaluated by 1-5 points, and developed by excel SPSS 23 program. /The result is statistically significant when the result is <0.05/

Evaluation of student satisfaction is as follows:

0.49-1.49   Satisfaction bad
1.50-2.49   Satisfaction low
2.50-3.49   Satisfaction moderate
3.50-4.50   Satisfied
4.50-5.0   Satisfaction high

Results: Research participants included 214 students from the 3ʳᵈ,4ᵗʰ, 5ᵗʰ grades of pharmacology and 2ⁿᵈ, 3ʳᵈ grades of SES course. The participants were asked to respond 6 section questions and the result is as follows: The average rating of the course progress and atmosphere, curriculum grade point average is 3.6, student evaluation of a teacher is 3.6,student's self-learning satisfaction 3.4;relationship between students is 3.8, The average rating of course materials is 3.4.

Accordingly, it is indicating that the satisfaction level is above average. The rating of relationship between students is the highest which is 3.8 while the rating of student's self-learning satisfaction is the lowest which is 3.4.

The comparison of GPA to the learning progress and environment, curriculum, student's self-learning satisfaction,teaching method, relationship between students, course materials is direct,weak and linear, and on that account GPA scores are likely to increase as the satisfaction of the above each section increases. Therefore, the GPA of the students who are satisfied with their learning environment is higher than students who are dissatisfied with their learning environment

Conclusion:

- The student satisfaction of learning environment is 3.4-3.8or above average. This indicates that the students are satisfied with their learning environment ($p < 0.05$). The comparison of the student's satisfaction level of learning environment to their GPA is direct, weak and linear.

- The GPA is tending to increase by 0.364 while increasing the satisfaction with the curriculum by 1 point and likewise, GPA will increase by 0.307 if the satisfaction of the teaching method is increased by 1 point.

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MENTAL DISTRESS AMONG THE MONGOLIAN GENERAL POPULATION

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Our study aimed to determine the mental distress and explore risk factors in the general population of Mongolia. As a part of a nationwide multicenter, interdisciplinary, prospective, population-based cohort study that investigates brain-related disorders in the general population of Mongolia, we recruited 646 participants from 64 sampling sites from 8 districts of Ulaanbaatar and prefectures of rural areas to identify their mental distress through an individual psychiatric interview following vital functions test and psychometric self-report questionnaires including quality of life survey (WHOQOL-BREF) and brain over-activity scale (BOS). Correlations and multiple linear regressions were used to analyze the associated risk factors to mental distress. The study was conducted between July and October 2020, in Mongolia. Among the participants (mean age=38.0±15.4), 57.6% were women, 60.2% married, 26.6% had a bachelor's degree or above, 48.3% lived in Ulaanbaatar, 47.5% were employed, and 2.3% had a household income of $525 or above. 35.9% were evaluated as having mental distress. Mentally distressed people showed increased BOS total scores compared with healthy people (p=0.035). The BOS total score was correlated inversely with all domains of the WHOQOL-BREF (r2, physical: -0.464, psychological: -0.373, environmental: -0.408, social: -0.227, p<0.001). It had larger discrepancies in physical (β= -0.524; p<0.001), environmental (β =-0.269; p = 0.001) domains of the WHOQOL-BREF, whereas it had smaller detriments in the psychological domain of the WHOQOL-BREF (β=-0.256; p=0.003). In conclusion, we found that 35.9% of the general population of Mongolia had mental distress. Mental distress was correlated with increased BOS total score and decreased WHOQOL-BREF scores in all domains. Brain overactivity was inversely correlated with the quality of life.

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A STUDY ON POSITIVE PSYCHOLOGICAL FEATURES OF 20-30 AGES OF YOUTHS IN MONGOLIA

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Aims & Objectives: This study identifies some of the positive psychological characteristics of Mongolian youth aged 20-30.

Compared to other branches of psychology, positive psychology encompasses a wide range of human development, health, family, psychological balance, treatment of mental and other illnesses, conditions for social happiness, and the use of scientific methods to relieve stress (Cherry, 2021).

Every country has been studying the positive psychological abilities of its citizens using this scientifically proven methodology and applying the results in practice. Therefore, this study was conducted because it was considered important to evaluate positive emotional attitudes of young people living in Mongolia by developing positive psychological skills using international theoretical methods.

Method & Results: This survey was taken by remote and 270 participants have been attended who ages between 20-30. To confirm the hypothesis of research, the results were obtained using SPSS (25) statistical processing software. The hypothesis of research was refuted by the fact that the positive psychological characteristics of Mongolian youths aged 20-30 did not depend on their age, gender, education level, family and employment status. Also, Mongolian youths have higher or better psychological characteristics than other countries youth as shown in the same way and in the same sample in some countries.

Conclusion: Some of the positive psychological characteristics of Mongolian youths aged 20-30 are compared with studies in other countries:

The PERMA model, PANAS, Gratitude, and Forgiveness are higher than in some countries due to the fact that Mongolian youths are more optimistic, emotional, and satisfied with their situation, shows that they are learning the ability to express and forgive.

I measured that the behaviors, feelings, and emotions of Mongolian youths in their 20s and 30s are highly adaptable to their environment, which is due to the development of technology, the transition to the information age, and lifestyle changes.

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CONTENT ANAYLSIS OF THE KINDERGARDEN CHILDREN

Uchral Tserentsoozol, Dulguun Batkhurel, Anujin

Aims & Objectives: The behavior of pre-school children (2-5 years old) is affected by certain external influences. As children in this age group become more aware of the universe, they tend to understand themselves as individuals.

Children of this age have imaginative and imitative behaviors. Russian psychologist D. B. Elkonin emphasizes that the main activity of "preschool children" is play. In addition to playing an important role in children's mental development, such as perception, attention, emotion, and communication, children use toys to solve problems, gain new knowledge, experiment, imagine things, and understand how things are going. As children play, they develop imitation behaviors that depend on many factors. D. B. Elkonin considered the basic unit of the game to be an "image."

Nowadays, children create role models not only from the toys they play, but also from many factors. With the advent of the Internet, cartoons for young children are becoming more and more popular. Therefore, watching cartoons for preschool children can give a positive or negative attitude.

So this research' purpose is that investigate how cartoons change behavior in preschoolers. And Objective is study the most watched cartoons on TV, choose a cartoon that can influence your behavior according to their list of movies, show each cartoon to kindergarten children for a month and at the end of the survey, the result will be developed and presented

Method & Results: This study will be conducted through content analysis an experimental methods

Conclusion:. Some modern television cartoons tend to have a positive effect on children's thinking and behavior. In terms of color matching, blue, pink, white, and green were the most common colors. These colors express a deep, high level of emotion and have a calm, stable pattern, businesslike, persistent, loving, intimate, and honest, which can have a positive effect on the child. Moral emotions and pleasurable emotions are commonly observed, which help children to express their emotions and to establish behaviors with the right attitudes in the child's cognition and socialization.And as a result of our team's survey of the most popular cartoons for young children on social media, Pororo cartoons were the most popular.

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VALIDATION OF FIVE FACTOR MODEL

Undarmaa Ulziidelger

Aims & Objectives: It is good that the use and benefit of psychological tests are increasing day by day, but it is necessary to take into account the negative consequences of unreliable tests. Using measures that have not been validated can lead to erroneous conclusions (Hobfoll et al. 2011). Simply put, only when the results are true can a true conclusion, and which can be interpreted and used. The following is an example of the many benefits of personality tests from psychological tests. Personality affects social relationships (Asendrop & Wilpers, 1998) and job burnout (Emilia I.De. et al, 2017). And are correlated with financial behavioral (Andreas Ohler , 2018) and human independence (Ali Zakia, 2020). Researchers agree that the FFM test, developed by McCray and Costa, is the most reliable of the personality test. Currently, there is no translated version of the FFM test in Mongolian. Therefore, the following steps were taken to translate the test into Mongolian and determine its reliability and validity.

- Conducted theoretical and case studies
- Asked the author for permission to use the test
- The test was translated into the native language
- Conducted pilot test
- The test was taken from the main sample
- Statistical analysis was performed
- Summarized the results of the survey

Method & Results: A total of 321 people (188 females and 123 males) aged 18 to 69 were included in the study. To test the stability of the test, data were collected using the retest method and processed using SPSS 25 software. The results of the study showed that the test reliability was acceptable, with openness .81, extravert .72, consciousness .82, neuroticism .72, and agreeableness .77, while "Use difficult words" and "Spend time reflecting on things" that items with score ≥ .3, validity was unacceptable.

Conclusion: Although the sentence structure and vocabulary of Mongolian and English are very different, we successfully translated the test into the target language. As a result of the study, it is assumed that the reliability and validity of the FFM test are provided. Therefore, this option can be used to diagnose clients in psychological counseling and to recruit staff for organizational psychology. The results of this study can also be used as a golden standard of criterion for testing the psychometrics of similar personality tests.

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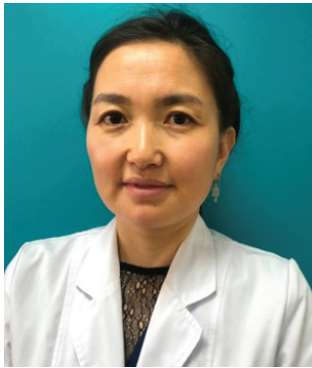
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PREVALENCE OF MALOCCLUSION AMONG MONGOLIAN POPULATION AGED BETWEEN 13-65 YEARS OLD

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Introduction: Now the World Health Organization estimates malocclusion as the third most prevalent oral health problem, following dental caries and periodontal diseases. Mongolian researchers did a survey of a prevalence of malocclusion in Ulaanbaatar city not in nationwide therefore aim of this study was to investigate prevalence of malocclusion and define its some risk factors and relation between malocclusion and quality of life in Mongolian population.

Material/Methods: The Montimeline cohort study conducts a nationwide multi-center, interdisciplinary, prospective, population-based cohort study to investigate malocclusion and its influence in human health such as brain-related disorders, sleep related syndromes in the general population of Mongolia. The study sample included 2000 participants aged 13 – 65 years. Mann-Whitney U and Kruskal Wallis H tests were used to evaluate the socio-demographic characteristics. Pearson chi square, t-test, One-Way ANOVA were employed to calculate mean's differences.

Results:

1. Study subjects age group between 13-18 years old had 91.8% malocclusion, 19-29 age group had 94.1%, 30-39 age group had 85.9%, 40-49 age group had 68%, 50 and older age group had 35.9% malocclusion.

2. Bad habits such as nail biting, one hand on chin, tongue thrust had statistically significant correlation with malocclusion. Plant allergy was the most common and correlated to malocclusion. Snoring was asked directly in questionnaire and had relation with malocclusion ($p < 0.05$).

3. Social and physical domains of quality of life questionnaire had significant correlation. Also participants with malocclusions had increased depression score ($p = 0.008$).

Conclusion:

1. Young age groups had high prevalence of malocclusion 19-29 years had 94.1%, 13-18 years had 91.8%. Age groups are in direct correlation.

2. Bad habits, plant allergy and snoring had statistically significant correlations with malocclusion.

3. Participants with malocclusion decreased QoL and increased depression. Further research is needed to investigate the causality of associations.

PARTICIPANTS

TRAINING SATISFACTION SURVEYS

*for participants in IBRO-APRC Associate School on Fundamental Techniques in Neuroscience –
The 4th Ulaanbaatar School Trainings*

Date: _____

Trainer: _____

The training I have received so far:	Strongly Disagree	Disagree	Neither Agree	Agree	Strongly Agree
PART A: Overall Experience					
1 The objectives of the training were clearly defined.	❑	❑	❑	❑	❑
2 Participation and interaction were encouraged.	❑	❑	❑	❑	❑
3 The topics were relevant to me.	❑	❑	❑	❑	❑
4 The distributed materials were helpful.	❑	❑	❑	❑	❑
5 This training will be useful for my work.	❑	❑	❑	❑	❑
6 The trainer was well prepared.	❑	❑	❑	❑	❑
7 The trainer explained all aspects thoroughly	❑	❑	❑	❑	❑
8 The time allotted for the trainings was sufficient.	❑	❑	❑	❑	❑
9 The facilities were adequate and comfortable.	❑	❑	❑	❑	❑
PART B: Meeting Structure					
10 The venue (meeting rooms)	❑	❑	❑	❑	❑
11 Food/beverage	❑	❑	❑	❑	❑
12 Schedule (timing of sessions, etc.)	❑	❑	❑	❑	❑
13 Small group sessions/workshops	❑	❑	❑	❑	❑

Please share any additional comments about the training.

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Thank you for taking time to provide your feedback on the training!