



Research Center for Neuroscience
Institute of Molecular Biosciences
Mahidol University, Salaya Campus,
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Mahidol University
Institute of
Molecular Biosciences

MBNS

HANDBOOK 2021



**International Graduate Program
in Neuroscience**

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Welcome message

It is with great pleasure to welcome you to the Neuroscience Graduate Program (M.Sc. and Ph.D. programs)

The Neuroscience Graduate Program at Mahidol University is a unique, diverse and up-to-date program that provides informative and integrated training in multidisciplinary areas of neuroscience research. Students will gain experience and knowledge through course work ranging from molecular and cellular neuroscience to developmental and clinical neuroscience.

We hope you will enjoy studying with us in better understanding the brain, its functions and disorders.

Banthit Chetsawang, Ph.D.

Head of Research Center for Neuroscience

Dear students

It gives me a great pleasure to welcome new freshmen of Neuroscience to the University. I wish you will enjoy your university life and start your distinguish study in warmly and socially environment here.

If you have any enquiries or any questions please kindly do not hesitate to contact me or our staffs.

Best wishes,

Sukonthar Ngampramuan, Ph.D.

Member of the IMB Student Affair Committee

The M.Sc. Program

Program Director: Asst. Prof. Dr. Sujira Mukda

Email: sujira.muk@mahidol.edu

Program learning outcomes (PLO)

1. Understand neuroscience aspect of human behavior and mental health.
2. Apply knowledge in neuroscience to develop research project. (1.3.3)
3. Generate new findings and draft research document for presentation in academic conference. (1.3.3)
4. Demonstrate ethical conduct following ethic rules. (1.3.1)
5. Perform effectively as a leader and member of the teamwork (1.3.4)
6. Demonstrate developed transferable skills including communication, information technology and academic presentation. (1.3.5)

The M.Sc. Curriculum

	Summer Course	
	SCID 500 Cell & Molecular Biology Total 3 credits	
Year	First Semester	Second Semester
1	MBNS 600 Neurobiology 3 (2-2-5) MBNS 605 Neurochemistry 2 (2-0-4) Elective courses [MBNS 606 & MBNS 655] 4 credits Total 9 credits	MBNS 603 Neuropsychopharmacology 2 (2-0-4) MBNS 604 Research Methodology and Techniques in Neuroscience 3 (2-2-5) Elective courses [MBNS650 & MBNS607] 5 credits Total 10 credits
2	MBNS 691 Seminars in Neuroscience 1 (1-0-2) MBNS 698 Thesis 6 (0-18-0) (Oral thesis proposal examination) Total 7 credits	MBNS 695 Seminars in Current Research in Neuroscience 1 (1-0-2) MBNS 698 Thesis 6 (0-18-0) (Oral thesis defense examination) Total 7 credits

List of Courses for the M.Sc. Curriculum

Required Course	Credit (lecture-lab-self study)
MBNS 600 Neurobiology	3 (2-2-5)
MBNS 603 Neuropsychopharmacology	2 (2-0-4)
MBNS 605 Neurochemistry	2 (2-0-4)
MBNS 604 Research Methodology and Techniques in Neuroscience	3 (2-2-5)
MBNS 691 Seminar in Neuroscience	1 (1-0-2)
MBNS 695 Seminars in Current Research in Neuroscience	1 (1-0-2)
SCID 500 Cell & Molecular Biology	3 (3-0-6)
Elective Course (at least 9 credits)	Credit (lecture-lab-self study)
MBNS 650 Developmental Neuroscience	2 (2-0-4)
MBNS 655 Pathogenesis of Neurological Diseases	3 (3-0-6)
MBNS 656 Behavioral and Cognitive Neuroscience	3 (2-2-5)
SIPS 603 Behavioral Neuroscience	2 (2-0-4)
MBNS 606 Current Topics in Neuroscience	1 (1-0-2)
MBNS 607 Advanced Research Project in Neuroscience	3 (0-9-3)
MBNS 698 Thesis	12 (0-48-0)

Requirements for Graduation

1. The learning period is no less than two academic years.
2. Pass all required and elective courses with GPA not less than 3.0.
3. Meet the foreign language proficiency requirement announced by the Faculty of Graduate Studies.
4. Pass the thesis defense examination. The graduation day is the same day that the students pass the thesis defense examination.
5. The thesis or a part of the thesis must be
 - 5.1 presented at an academic conference that has a peer review and publishes the full paper in the proceedings.
 - 5.2 A student can submit his/her thesis for publication only after his/her thesis topic has been approved by the Faculty of Graduate Studies.

The Ph.D. Program

Program Director: Assoc. Prof. Dr. Nuanchan Chutabhakdikul

Email: nuanchan.chu@mahidol.edu

Program learning outcomes (PLO)

1. Integrate knowledge in basic, advanced and clinical neuroscience with other related fields to understand the brain, the neurobiological basis of behavior and their dysfunction. (1.3.2)
2. Apply knowledge in neuroscience to develop research project and conduct research experiment. (1.3.5)
3. Create new body of knowledge and draft research manuscript for publication in an international peer review journal. (1.3.3)
4. Demonstrate ethical conduct following ethic rules. (1.3.1)
5. Perform effectively as a leader and member of the teamwork. (1.3.4)
6. Demonstrate developed transferable skills including communication, information technology and academic presentation. (1.3.5)

The Ph.D. Curriculum

This curriculum is composed of two study plans.

The First Study Plan is for those who obtained *a M.Sc. Degree*. In fulfilling the degree requirements for the Ph.D. degree, students are expected to select following study plan.

Study Plan 1 for students who graduated from *M.Sc. program with paper publication* in neuroscience field (compatible with this curriculum)

	Summer Course Total - credits	
Year	First Semester	Second Semester
1	MBNS 690 Seminars in Advanced Neuroscience (audit) MBNS 898 Dissertation 8 (0-36-0) (Qualifying examination) (oral thesis proposal examination) Total 8 credits	MBNS 694 Seminars in Integrated Neuroscience (audit) MBNS 898 Dissertation 8 (0-36-0) Total 8 credits
2	MBNS 898 Dissertation 8 (0-36-0) Total 8 credits	MBNS 898 Dissertation 8 (0-36-0) Total 8 credits
3	MBNS 898 Dissertation 8 (0-36-0) Total 8 credits	MBNS 898 Dissertation 8 (0-36-0) (Oral thesis defense examination) Total 8 credits

Study Plan 2:

Study Plan 2.1 for students who graduated from *Neuroscience M.Sc. program*

	Summer Course Total - credits	
Year	First Semester	Second Semester
1	MBNS 690 Seminars in Advanced Neuroscience 1 (1-0-2) MBNS 651 Neuroendocrinology 2 (2-0-4) MBNS 653 Clinical Neuroscience 3 (3-0-6) Elective course 4 credits (MBNS606 or MBNS656) Total 10 credits	MBNS 694 Seminars in Integrated Neuroscience 1 (1-0-2) MBNS 654 Selected Topics in Contemporary Neuroscience 1 (1-0-2) MBNS 699 Dissertation 4 (0-12-0) (Qualifying examination) (Oral thesis proposal examination) Total 6 credits
2	MBNS 699 Dissertation 8 (0-24-0) Total 8 credits	MBNS 699 Dissertation 8 (0-24-0) Total 8 credits
3	MBNS 699 Dissertation 8 (0-24-0) Total 8 credits	MBNS 699 Dissertation 8 (0-24-0) (Oral thesis defense examination) Total 8 credits

Study Plan 2.1 for students who graduated from *other M.Sc. programs*

	Summer Course Total - credits	
Year	First Semester	Second Semester
1	MBNS 600 Neurobiology 3 (2-2-5) MBNS 605 Neurochemistry 2 (2-0-4) Elective courses [MBNS655] 3 credits Total 8 credits	MBNS 603 Neuropsychopharmacology 2 (2-0-4) MBNS 654 Selected Topics in Contemporary Neuroscience 1 (1-0-2) Elective courses (MBNS650) 2 credits Total 5 credits
2	MBNS 690 Seminars in Advanced Neuroscience 1 (1-0-2) MBNS 651 Neuroendocrinology 2 (2-0-4) MBNS 653 Clinical Neuroscience 3 (3-0-6) MBNS 699 Dissertation 6 (0-18-0) (Qualifying examination) (Oral thesis proposal examination) Total 12 credits	MBNS 694 Seminars in Integrated Neuroscience 1 (1-0-2) MBNS 699 Dissertation 10 (0-30-0) Total 11 credits
3	MBNS 699 Dissertation 10 (0-30-0) Total 10 credits	MBNS 699 Dissertation 10 (0-30-0) (Oral thesis defense examination) Total 10 credits

Study Plan 2.2 is designed for those who graduated with *a B.Sc. Degree*. The course requirement for this plan is at least 23-credit course work and a 48-credit research thesis.

	Summer Course	
	SIID 501 Molecular and Cellular Basis of Biomedicine Total 3 credits	
Year	First Semester	Second Semester
1	MBNS 600 Neurobiology 3 (2-2-5) MBNS 605 Neurochemistry 2 (2-0-4) Elective courses [MBNS655] 3 credits Total 8 credits	MBNS 603 Neuropsychopharmacology 2 (2-0-4) MBNS 604 Research Methodology and Techniques in Neuroscience 3 (2-2-5) MBNS 654 Selected Topics in Contemporary Neuroscience 1 (1-0-2) Elective courses (MBNS650) 2 credits Total 8 credits
2	MBNS 690 Seminars in Advanced Neuroscience 1 (1-0-2) MBNS 651 Neuroendocrinology 2 (2-0-4) MBNS 653 Clinical Neuroscience 3 (3-0-6) MBNS 799 Dissertation 3 (0-9-0)	MBNS 694 Seminars in Integrated Neuroscience 1 (1-0-2) MBNS 799 Dissertation 9 (0-27-0)

	Summer Course	
	SIID 501 Molecular and Cellular Basis of Biomedicine Total 3 credits	
Year	First Semester	Second Semester
	(Qualifying examination) (Oral thesis proposal examination) Total 9 credits	 Total 9 credits
3	MBNS 799 Dissertation 9 (0-27-0) Total 9 credits	MBNS 799 Dissertation 9 (0-27-0) Total 9 credits
4	MBNS 799 Dissertation 9 (0-27-0) Total 9 credits	MBNS 799 Dissertation 9 (0-27-0) (Oral thesis defense examination) Total 9 credits

List of Courses for the Ph.D. Curriculum

Required Course	Credit (lecture-lab-self study)
MBNS 600 Neurobiology	3 (2-2-5)
MBNS 603 Neuropsychopharmacology	2 (2-0-4)
MBNS 604 Research Methodology and Techniques in Neuroscience	3 (2-2-5)
MBNS 605 Neurochemistry	2 (2-0-4)
MBNS 651 Neuroendocrinology	2 (2-0-4)
MBNS 653 Clinical Neuroscience	3 (3-0-6)
MBNS 654 Selected topics in Contemporary Neuroscience	1 (1-0-2)
MBNS 690 Seminar in Advanced Neuroscience	1 (1-0-2)
MBNS 694 Seminars in Integrated Neuroscience	1 (1-0-2)
Elective Course	Credit (lecture-lab-self study)
MBNS 650 Developmental Neuroscience	2 (2-0-4)
MBNS 655 Pathogenesis of Neurological Diseases	3 (3-0-6)
MBNS 656 Behavioral and Cognitive Neuroscience	3 (2-2-5)
MBNS 606 Current Topics in Neuroscience	1 (1-0-2)
MBNS 607 Advanced Research Project in Neuroscience	3 (0-9-3)
SIPS 603 Behavioral Neuroscience	2 (2-0-4)
MBNS 699 Dissertation	36 (0-108-0)

MBNS 799	Dissertation	48 (0-144-0)
MBNS 898	Dissertation	48 (0-144-0)

Requirements for Graduation

1. The learning period is no less than three or four (study plan 2.2) academic years.
2. Pass all required and elective courses with GPA not less than 3.0.
3. Pass the Qualifying Examination.
4. Meet the foreign language proficiency requirement announced by the Faculty of Graduate Studies.
5. Pass the thesis defense examination. The graduation day is the same day that the students pass the thesis defense examination.
6. The thesis or a part of the thesis must be
 - 6.1 published or accepted to be published in an international peer-reviewed journal at least 1 or 2 (Research track) articles and all articles must be consistent in content.
 - 6.2 A student can submit his/her thesis for publication only after his/her thesis topic has been approved by the Faculty of Graduate Studies
7. The thesis publishing must comply with the regulations on thesis publishing for graduation in a doctoral degree program announced by the Faculty of Graduate Studies.

Course Description

Required Course

MBNS 600 Neurobiology

Fundamental theories and laboratory practice on human nervous system; the organization of the nervous system and the relationship between the brain; mind and behavior; principle of chemical neurotransmission and neurotransmitters and evolution of the neural circuitry from animals to man; the development of the nervous system and anatomical functional of each brain region

MBNS 603 Neuropsychopharmacology

Drug actions on the nervous system comprises areas of investigation of critical importance to science and medicine; the mechanisms by which drugs alter brain functions; medications used to treat a wide range of neurological and psychiatric disorders as well as drugs of abuse

MBNS 604 Research Methodology and Techniques in Neuroscience

The principles and methods used in neuroscience research; experimental design, data analysis and interpretation; presentation of the research results; technique to analyse the physiological, anatomical, and chemical changes of the cells, proteins, or genes in the nervous system

MBNS 605 Neurochemistry

Principle of chemical transmission; second messenger; signaling transduction; neurotransmitters; neurotransmitter receptors; nuclear hormone receptor signaling; advances in neuronal stem cells research and molecular modeling for neuroscience

MBNS 651 Neuroendocrinology

Theoretical and experimental studies of the relationships between the nervous system and the endocrine glands; neural controls of endocrine functions; endocrine and hormonal influences on the development and function of the nervous system and their behavioural correlates to organs

MBNS 653 Clinical Neuroscience

Classification of neurological and psychiatric diseases, symptomatology of neurological diseases, headache and migraine headache, common neurological diseases in children and adult, brain developmental disorders, common psychiatric diseases, schizophrenia, mood disorders, neurological examination, investigation for neurological diseases, electroencephalography, psychiatric interview and mental status examination,

neuropsychological tests, consciousness and sleep test, principle of treatment in neurological and psychiatric diseases, medical ethics

MBNS 654 Selected Topics in Contemporary Neuroscience

An independent study on selected topics of contemporary neuroscience research, related to neurological and mental health problems; effects of the brain and behavior in children; aging of the brain and neurodegeneration such as Alzheimer's disease; substance abuses; stress and stress management; new innovative technologies in the neuroscience research; developing the concept paper and giving the presentation to the class

MBNS 690 Seminars in Advanced Neuroscience

Opportunity to explore advanced research in the field of neuroscience by searching the literature on interesting topics; review and summarize research findings from several original articles; interpret the results, analyze and criticize those finding logically and ability to create new research questions. Students will be trained to generate the standard scientific presentation using proper presentation tools and proper presentation skill

MBNS 691 Seminars in Neuroscience

Presentation and discussion articles from technical journals; content area of thesis conduction; the morality and ethics of being a neuroscientist

MBNS 694 Seminars in Integrated Neuroscience

Literature review in the neuroscience research field of interest; compilation and presentation in a systematic manner; discussion with ethics; in-depth analysis of results; exchange of academic opinion; synthesis and integration of new concepts or theories from knowledge gained and recommendation on further research direction

MBNS 695 Seminars in Current Research in Neuroscience

Present and discuss of the current research in neuroscience; research articles integration; correlation of selected research topics with thesis research

SCID 500 Cell & Molecular Biology

Life and information flow in cell, energy flow in biosystem, cell structure and function, cell signaling, cell division, cellular differentiation, cell death and development

MBNS 698 Thesis

Identifying research proposal; conducting research with concern of research ethics; data collection; analysis; interpretation of the result and report the result in terms of thesis; presenting and publishing research in standard journals or a conference's proceedings

MBNS 699 Dissertation

Identifying research proposal; Conducting research with concern of research ethics; Data collection, analysis, interpretation of the result and report the result in terms of thesis; Presenting and Publishing research in international peer-reviewed journal, ethics in dissemination of the research results

MBNS 799 Dissertation

Identifying research proposal; Conducting research with concern of research ethics; Data collection, analysis, interpretation of the result and report the result in terms of thesis; Presenting and Publishing research in international peer-reviewed journal, ethics in dissemination of the research results

MBNS 898 Dissertation

Identifying research proposal; Conducting research with concern of research ethics; Data collection, analysis, interpretation of the result and report the result in terms of thesis; Presenting and Publishing research in international peer-reviewed journal, ethics in dissemination of the research results

Elective Course

MBNS 650 Developmental Neuroscience

Cellular and molecular mechanisms of brain development; neural induction; neurulation; neural patterning; neurogenesis; neural determination; neural migration; axonal navigation and targeting; synapse formation; programmed cell death; roles of the neurotrophic factors in neural development; neural correlate of behavioral development; factors affected brain development; aging of the brain

MBNS 655 Pathogenesis of Neurological Diseases

Mechanism of neurological diseases, inflammation, neural and glia response to injury, pathological investigation, brain edema and hydrocephalus, neurogenetic diseases, aging and neurodegenerative diseases, autoimmune diseases of the CNS, cerebrovascular disease, brain tumor, CNS infection, congenital CNS malformation and perinatal neuropathology, brain and spinal cord injuries, toxic and metabolic diseases of nervous system, neurocutaneous syndromes, psychopathology, clinico-pathological correlation

MBNS 656 Behavioral and Cognitive Neuroscience

Association among the brain, the mind, and the behaviors, neurobiology of cognition, genetic and molecular aspects of cognitive functions, animal models for behavioral studies, assessment of animal behaviors, electroencephalography and event-related potentials, neuropsychological tests, neuroimaging, human cognition, executive functions, social behaviors and social cognition, multiple intelligence

MBNS 606 Current Topics in Neuroscience

Interpretation; critical review and discussion of recent publications related to advanced knowledge and technology in neuroscience

MBNS 607 Advanced Research Project in Neuroscience

Principle and research methodology in neuroscience; searching databases or literature related to the project; performing experiments with research ethics awareness; analysis and interpretation of the experimental data; presentation of the results via a short seminar; research report

SIPS 603 Behavioral Neuroscience

Biological of behavior, neuroanatomical basis of behavior, structure of the nervous system, methods of investigating physiological behavior, development and evolution of the brain, principle of psychopharmacology, neurotransmitter and neuromodulator, movements and actions, sleep and biological rhythm, the regulation of internal body states, ingestive behaviors and eating disorders, autonomic dysfunction, hormones and sexual behavior, emotional behavior and stress, the biology of learning and memory, cognition and language, neurological disorders

Teaching Staffs and Research Interests



Professor Emeritus Dr. Piyarat Govitrapong

Ph.D. (Neuropharmacology), University of Nebraska, USA

E-mail: piyarat.gov@mahidol.ac.th

Research Interests: Melatonin, Drug addiction,
Neurodegenerative disorders, Alzheimer's disease, Aging

While the level of neurogenesis can be modulated by factors such as diet, environmental stimuli and neurotrophic factors, there is little information to date regarding the intrinsic mechanisms underlying the age-related decline in neural stem cell function. Many of mechanisms that regulate neural development are believed to play a role in the aging of the nervous system.

How might development mechanisms contribute to the pathogenesis of neurodegenerative disorders? More people are hospitalized with neurological and mental disorders than any other major disease group. There is increasing evidence suggesting that the brain plays major role in regulating life span as well as health status during the aging process. The nervous system contains several signaling pathways that influence and regulate lifespan in individuals. Cells in the brain die following stroke, trauma and chronic neurodegenerative disease.

A detailed understanding of the factors governing fetal and adult neural stem cells in vivo may ultimately lead to elegant cell therapies for neurodegenerative disorders. Thus, studies are encouraged and needed to identify, characterize and elucidate mechanisms of certain factors that are both positive and negative, influencing the neurogenesis (brain development) throughout life-span, including prenatal, postnatal, adult and aging periods.



Prof. Dr. Banthit Chetsawang

Ph.D. (Neurosciences) Mahidol University, Thailand, 1998.

Email: banthit.che@mahidol.ac.th

Research Interests: Neurodegeneration

The main area of my research interests is focusing on neurodegeneration, neuroprotection and neurorestoration especially the death and survival signaling in neuronal cells and the protective roles of melatonin on the neurodegeneration. Moreover, the neurotoxic effects of drug abuse such as methamphetamine on neurodegeneration and cognitive impairment have also been studied.



Assoc. Prof. Dr. Nuanchan Chutabhakdikul

Ph.D. (Neurosciences) Mahidol University, Thailand, 1998.

Email: nuanchan.chu@mahidol.edu

Research Interests: Molecular mechanisms of early life stress on brain development and a possibility for reprogramming; Development of Executive function and Self-regulation in child and adolescence; Neuroscience and Education

My research interest focused on the effects of maternal stress on brain development e.g., neurogenesis, neural migration, axonal growth, and synapses formation. Recent work focused on the roles of the placenta barrier in modulating the effects of maternal stress on the neuro-immune function in the pup's brain to understand the mechanism of neurodevelopmental disorders and to explore the possibility of reprogramming.

Another research interest focuses on the development and fostering of attention, executive function, and self-regulation in young children and adolescence. The goal is to translate neuroscience research to support early childhood care and education, and to improve school learning outcomes in Thai children.



Asst.Prof.Dr. Sukonthar Ngampramuan

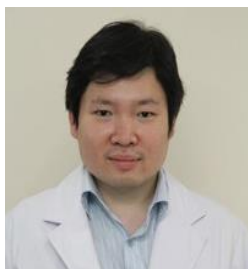
Ph.D. (Neurosciences) Mahidol University, Thailand, 2008

Email: sukonthar.nga@mahidol.ac.th

Research Interests: Neuro-Cardiology

My current research in Neurocardiology investigates the principles of interaction between the brain and the heart. I am interested in the brain control of cardiac regulation in responses to psychological stresses – a clinically important and poorly understood area. I have recently demonstrated that sudden altering stimuli can precipitate potentially fatal ventricular arrhythmias in animals, just as it sometimes happens in humans. In addition to conscious animal models, I use anesthetized animals to study descending pathways to the heart and their neurochemistry. I am currently running experimental protocols with telemetric recordings of cardiac parameters and stereotactic microinjection of pharmacological substances into the brain areas involved in the cardiac control.

In collaboration with Dr. Eugene Nailvaiko (Newcastle, AU), we have described the pharmacological inhibition of the amygdala prevents restraint-stress tachycardia in rats and discovered that the activation of serotonin 1A agonist (5-HT_{1A}) receptor in the medullary raphe area also reduces tachycardia during restraint stress. This discovery has led me to hypothesize that 5-HT_{1A} receptors may represent a mechanism link between stress and cardiac malfunction. I expect my future work would provide new understandings about stress-related cardiac diseases.



Asst.Prof. Vorasith Siripornpanich, M.D., Ph.D.

Doctor of Medicine (First class honor) Mahidol University,
Thailand

Ph.D. (Neuroscience), Mahidol University, Thailand

Diploma Thai Board of Pediatrics and Pediatric Neurology

Email: vorasith.sir@mahidol.ac.th, drvorasith@gmail.com

Research Interests: Cognitive neuroscience / Clinical
neuroscience

The good quality of people is the most important factor for national development, so I and my research group plan to answer the question “how to improve the cognitive abilities in Thai people” by studying both healthy people and patients with neurological and psychiatric diseases.

At human level, we have been interested in using electrophysiological tools for studying cognitive functions. The electrophysiological tools such as EEG (Electroencephalography), EP (Evoked Potentials), and ERP (Event-Related Potentials) can measure electrical activities of the brain with excellent temporal resolution and are able to show information in each brain region under defined conditions. We use these techniques for evaluating the brain functions in the normal population as well as patients with brain diseases including epilepsy, attention deficit hyperactivity disorder (ADHD), autism spectrum disorder, schizophrenia and substance use disorder. Moreover these electrophysiological techniques can be used to compare human cognition before and after neurological intervention such as effects of essential oil inhalation or musical sound learning on attention / concentration domain of human cognition. Thus this information from electrophysiological tools provide us with solid data of brain functions and can be integrated with anatomical and molecular data from experimental animal models leading to the knowledge of “functional localization” of cognitive brain areas and also factors that can improve cognitive function in Thai people.



Asst. Prof. Dr. Sujira Mukda

Ph.D. (Neurosciences), Mahidol University, Thailand

Email: sujira.muk@mahidol.edu

Research interest: Melatonin, Drug addiction, Cerebrovascular disease, Aging, Circadian rhythm and Clock genes

Our current research interests are primarily on the neurobiological consequences of drug abuse and addiction on the brain and behaviors. The purpose of our work aims to approach the vulnerabilities of addiction emphasizing on the neurotoxicity, neuronal cell degeneration, neuroinflammation, cognitive impairment, and neurodevelopmental deficits, as well as the accompanying changes in the brain areas involved in drug addiction and cognition.

In addition, our research interests are also focusing on how drugs of abuse impact the molecular and physiological circadian clocks, and *vice versa*, how disruption of the circadian rhythms plays a key part in regulating the brain's reward-related pathways. The therapeutic approach that reset the circadian rhythm contributes to clock-drug interactions will also be studied.

Another research study in our lab is focusing on the neurobiological consequences of cerebrovascular disease (stroke), particularly after a transient ischemic stroke, which results in neuronal cell death and eventually leads to serious neurological consequences including cognitive impairments and dementia. Our research aims are focusing on the signaling molecules crucial for memory formation, and develop therapeutic approaches to slow down the progression of memory and cognitive deficits after stroke.



Asst. Prof. Dr. Kittikun Viwatpinyo

Ph.D. (Anatomy), Mahidol University, Thailand

Email: kittikun.viw@mahidol.ac.th

Research interest: Oligodendrocytes and mechanism of myelin damage, histopathology of nervous tissue

The functional components of the white matter in the central nervous system are myelinated axons and oligodendrocytes. It is well-known that oligodendrocytes maintain axonal functions by providing oxygen and glucose for metabolism, and keep myelin sheath in check in order to maximize speed of neural transmission. During pathological conditions, such as ischemia, inflammation or demyelinating disease, oligodendrocytes might be affected by accumulation of reactive oxygen species, excitatory amino acids and inflammatory cytokines. These molecules could lead to oligodendrocyte dysfunction and loss of myelin integrity. My research group is attempting to investigate the detailed mechanism of how oligodendrocytes respond to certain molecules under pathological conditions using animal and cell culture models, and how to improve oligodendrocyte function and myelin content within damaged white matter. I am also interested in research involving histopathological changes in brain, spinal cord and peripheral nerves after exposure to toxic substances, ranging from heavy metals to pesticides and drugs of abuse.



Dr. Chutikorn Nopparat

Ph.D. (Neurosciences), Mahidol University, Thailand

Email: chutikorn.nop@mahidol.ac.th

Research interest:

My main research areas are focusing on neurodegeneration, melatonin as neuroprotection and neurorestoration, especially the death and survival signaling cascades in neurons. In addition, my study intends to understand the autophagy processes which involve the maintenance of cellular nutrient balance and cell degradation in aging, metabolic diseases and dementia. The mechanisms of amphetamine-induced neurotoxicity, neuronal cell degeneration and Alzheimer's disease are also continuing to explore in my interest. Furthermore, the ongoing research is about the factors which are affected on working memory capacity in preschool children including the program to improve working memory.



Dr. Jiraporn Panmanee

Ph.D. (Biological Science), University of Liverpool, UK

Email: jiraporn.pam@mahidol.ac.th

Research interest: Neurotoxicity/
Neurodegeneration/ Structural neurobiology

My research interests derive from this question: What the effects of long-term exposure to different classes of pesticides at a residual dose are, and whether the classical pesticides can interact with other cellular proteins apart from their commonly known targets. Currently, my main research focus is on the potential mechanism of neurodegeneration induced by pesticide exposure of the commonly used pesticides, e.g., organophosphates, carbamates and synthetic pyrethroids. At a residual dose, computational tools combining empirical cellular and proteomics studies are employed for studying their neurotoxicities in various aspects from acute cellular responses to long-term neurotoxicity. Furthermore, my future aim is to develop a new class of pesticides with less neurotoxicity by repurposing any compounds that may adopt pesticidal properties using structure-based design, virtual screening and activity tests.

Complaints and Appeals Process

Institute of Molecular Biosciences

- **Complaint/Appeal**

relates to the following:

1. Academic/Support staff
2. Graduate Programs/Services
3. Comment/suggestion

- **Complaints/Appeals Form**

Contains:

1. Name, Surname, address, telephone number
2. Complaint/Appeal issue
3. Polite contents
4. Signature at the end of the form

- **The following items will not be considered:**

1. Thailand's monarchy
2. Policy of the Thai Government
3. Judicial process
4. No signature/Items that cannot be traced
5. Complaints that have already been considered by the Government

- **Procedures**

1. Obtain Complaints/Appeals Form from MB Legal Affairs Division or download from the MU Legal Affairs Division website
2. Submit the signed completed form by post to MB Director or e-mail to Ms.Issariya Dissariyawongwarang (issariya.dis@mahidol.ac.th)
Or
3. Submit the form in MB Suggestion Box at **the 1st floor in front of the meeting rooms or the 3rd floor in front of the library**

กล่องรับเรื่องร้องเรียน
ของบุคลากร นักศึกษาหลักสูตรของสถาบันฯ และผู้รับบริการอื่น ๆ
ของสถาบันชีววิทยาศาสตร์โมเลกุล มหาวิทยาลัยมหิดล
เปิดกล่องรับเรื่องร้องเรียน ทุกวันศุกร์เวลา 9.30 น.
โดยคณะกรรมการจัดการข้อร้องเรียน
สถาบันชีววิทยาศาสตร์โมเลกุล มหาวิทยาลัยมหิดล

For more information, please contact
Ms.Issariya Dissariyawongwarang
ext.1451

Web Page of Faculty of Graduate Studies, Mahidol University

- **e-registration**

http://www.grad.mahidol.ac.th/GoPZ_Temp/main/FormLogin.php

- **e-Registration Guide**

http://www.grad.mahidol.ac.th/GoPZ_Temp/manual/manual-student.php

- **Course Evaluation System**

<http://www.grad.mahidol.ac.th/Evaluation-index/>

- **e-Form: Thesis**

<http://www.grad.mahidol.ac.th/prof/student>

- **Thesis Preparation and Submission**

<http://www.grad.mahidol.ac.th/thesis/>

- **Download Forms**

<http://www.grad.mahidol.ac.th/en/current-students/download-forms.php>

- **Soft Skills**

<http://www.grad.mahidol.ac.th/softskills/>

- **Postgraduate Student Handbook**

<https://graduate.mahidol.ac.th/download/current-student/pdf/Postgraduate-Student-Handbook-en.pdf>

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