

Course Title/Code: Neurobiological Processes in Psychosis (MMPH6195)

Department: Psychiatry

Objective: Psychotic disorders involve dysfunctions in specific brain systems. A solid understanding of these neurobiological processes is indispensable to professionals working in the field, as it provides the scientific rationales for pharmacological and psychological treatments. This module provides participants with a practical overview of the functions of relevant brain circuits, including the prefrontal and medial temporal cortical systems, the striatum, thalamus, and the limbic networks. The role of neurotransmitters will be explored, particularly the dopamine system in relation to the processing of salience information in the environment. Brain functions in psychosis will be examined in light of neuroimaging findings.

Content:

The brain and psychosis

- Stress-vulnerability model
- Dysfunctional associative learning hypothesis
- Neurodevelopmental hypothesis

Brain systems in psychosis I

- Basic neuroanatomy system
- Functional neuroanatomy

Brain systems in psychosis II

- Neurodevelopment, pruning
- Brain system implicated in psychosis
- Lateralization

Chemical systems and psychosis I

- Introduction of Neurotransmitters
- Interaction of neurotransmitters

Chemical systems and psychosis II

- The role of dopamine system
- The role of other neurotransmitters (glutamate, cannabinoid, GABA)
- Hormones (prolactin, ACTH)

Brain functions in psychosis I

- Introduction of neuroimaging
- Evidence of structural neuroimaging studies
- Evidence of functional magnetic resonance imaging

Brain functions in psychosis II

- Introduction of Neuroconnectivity
- Other techniques: EEG, MEG, PET, SPECT
- Other neurophysiological studies : PPI, P300, P50

Neurocomputational model of psychosis

- Information processing failure

Learning outcomes:	<p>On completion of the course, the students are expected to:</p> <ul style="list-style-type: none"> • be familiar with the current understanding of the neurobiological models of psychosis • acquire basic knowledge about neuroanatomy and functional neuroanatomy, particularly with reference to psychosis • acquire basic knowledge about different neurotransmitters, their actions and roles, with particular emphasis on the role and action of dopaminergic system and its relationship with symptoms of psychosis • understand the neurodevelopmental theory of psychosis such as pruning and lateralization • understand stress-vulnerability models and the evidence associated with this • be aware of the dysfunctional associative learning model and its evidence • understand the principle of information processing failure and its relationship with psychosis • be familiar with the current evidence of the neurobiological basis of psychosis from different investigative modalities
Prerequisite:	None
Duration:	1 semester; 2.5 hours/week; 24 contact hours
Assessment:	<p>Continuous assessments (40%) Written examinations (60%)</p>
Remarks:	Priority will be given to research postgraduate students whose research projects are on a psychosis-related topic.