Research Theme (Please indicate as appropriate)

☐ Dermatology & Skin Biology  ☐ Family Medicine & Primary Care
☐ Health Systems & Population Health  ☐ Infection & Immunity
☐ Metabolic Disorders  ☒ Neuroscience & Mental Health
☐ Medical Education  ☐ Others (Please specify):

Research Project Title:

Functions of local inhibitory circuits in the claustrum in attention selection

Project Description:

The claustrum is an enigmatic brain area that has recently been implicated in allowing the brain to determine what to pay attention to. The goal of this project is to determine the role that local interneurons within the claustrum plays in attention. The experiments will combine in vivo optogenetics with behavioural measurements of attention in mice to determine what happens to attention selection when various types of inhibitory interneurons within the claustrum are silenced via optogenetic photoinhibition. Different lines of transgenic mice that express halorhodopsin or archaerhodopsin in identified claustrum interneuron subtypes - PV, SST and VIP-expressing interneurons neurons – will be used to identify the function of each of these interneurons. To permit interpretation of the results of these behavioural experiments, additional experiments will pair optogenetics with brain slice electrophysiology to determine the physiological actions of each subtype of interneuron on the activity of neighbouring neurons.

Brief summary of main Methodologies and/or Techniques to be learned during the proposed PhD (experimental or analytical):

Neurophysiology
Patch clamp recording
Optogenetics
Behavioural analyses
Keywords: claustrum, attention, interneurons, local circuits
### Supervisor(s)

**Primary Supervisor**

<table>
<thead>
<tr>
<th>Name of Supervisor:</th>
<th>George J. Augustine</th>
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<tbody>
<tr>
<td>Designation:</td>
<td>Irene Tan Liang Kheng Chair Professor of Neuroscience</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:George.augustine@ntu.edu.sg">George.augustine@ntu.edu.sg</a></td>
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**Co-Supervisor (need not be determined at this time)**

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<th>Name of Supervisor:</th>
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### Main Location of Research Work (Please indicate as appropriate)

- [ ] LKCMedicine Experimental Medicine Building @ Yunnan Campus
- [x] LKCMedicine Clinical Sciences Building @ Novena Campus
- Others (Please specify):

### Other Information

1. Does the proposal need IRB’s approval?
   - [ ] Yes  [x] No
2. Does the project involve contact with patients?
   - [ ] Yes  [x] No
3. Is there a potential for overseas academic exchange as part of this research project?
   - [ ] Yes  [x] No

If “Yes”, please specify: ________________________________

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