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:
Brain mechanism underlying working memory

Project Description:
The project aims to understand the brain mechanism that supports higher cognitive functions using mouse models. Especially by focusing on the prefrontal cortex (PFC) that is situated on the top hierarchy in the brain, the project will investigate how the PFC orchestrates and regulates the other downstream brain regions to implement working memory. Through this project, students will be able to learn multiple state-of-the-art technologies in neuroscience including in vivo calcium imaging, cell-type-specific optogenetics, circuit manipulations, and circuit mapping using tissue clearing.

Brief summary of main Methodologies and/or Techniques to be learned during the proposed PhD (experimental or analytical):
In vivo calcium imaging, behavioral training based on operant conditioning, histology, tissue clearing, light-sheet imaging

Keywords:
prefrontal cortex; working memory; schizophrenia; neural circuit; mouse; circuit mapping; optogenetics
## Supervisor(s)

### Primary Supervisor

<table>
<thead>
<tr>
<th>Name of Supervisor:</th>
<th>Tsukasa Kamigaki</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation:</td>
<td>Assistant Professor</td>
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<td>Email:</td>
<td><a href="mailto:tsukasar@ntu.edu.sg">tsukasar@ntu.edu.sg</a></td>
</tr>
</tbody>
</table>

### Co-Supervisor *(need not be determined at this time)*

<table>
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<th>Name of Supervisor:</th>
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<tbody>
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<td>Designation:</td>
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<td>Email:</td>
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## Main Location of Research Work *(Please indicate as appropriate)*

- [ ] LKCMedicine Experimental Medicine Building @ Yunnan Campus
- ✗ LKCMedicine Clinical Sciences Building @ Novena Campus

### Others *(Please specify)*:

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## Other Information

1. Does the proposal need IRB’s approval?  
   - Yes  
   - No

2. Does the project involve contact with patients?  
   - Yes  
   - No

3. Does the project involve contact with animals  
   - Yes  
   - No

   If “Yes”, is the NTU-Institutional Animal Care and Use Committee approval in place?  
   - Yes  
   - No

4. Is there a potential for overseas academic exchange as part of this research project?  
   - Yes  
   - No

   If “Yes”, please specify:

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