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| **Research Theme: Proteomics and Protein** |
| **PhD Research Project Title:**  Epitope mapping of polyclonal antibodies associated with infections disease via hydrogen-deuterium exchange mass spectrometry. |
| **Scholarship category (Please indicate the type of scholarship for this project):**   1. **SBS Research Student Scholarship (for SBS faculty only)** 2. **NTU Central RSS** |
| **Principal Investigator/Supervisor: Xueming Dong** |
| **Co-supervisor/ Collaborator(s) (if any):** |
| **Project Description**  **a) Background:**  Epitope mapping of antibody (Ab) is essential for understanding adaptive immunity and the action mode of related therapeutic antibodies and vaccines. In-depth knowledge of binding sites of the polyclonal antibody population (pAb) produced during immune response is tremendously valuable to drug and vaccine development. Unfortunately, methods to mapping pAb epitopes are limited due to pAb’s inherent complexity. This limitation significantly slowed down the development for antibody-based therapeutic and vaccinations. Recently, hydrogen-deuterium exchange mass spectrometry (HDX-MS) has been reported to be capable of epitope mapping of pAb isolated from rabbits immunized with factor H-binding proteins. Therefore, in this study, we plan to implement HDX-MS for epitope mapping of pAb derived from Dengue NS1 proteins and critical antigens from other infectious disease. This work provides novel critical insights into the adaptive immune response upon antigen introduction that is vital for developing effective therapeutic treatment for Dengue and other infectious disease.  **b) Proposed work:**  In this project the student needs to learn operation and maintenance of the in-house build HDX-MS system in SBS. The student will utilize the HDX-MS system to study binding profiles between antigens and their associated pAb from model animals.  **c) Preferred skills:**   1. Experience with mass spectrometry instrumentation is a plus but not required. 2. Experience in HDX-MS and related publication is highly desired. |
| **Supervisor contact:**  **xueming.dong@ntu.edu.sg** |
| **SBS contact and how to apply:**  Associate Chair-Biological Sciences (Graduate Studies) : [AC-SBS-GS@ntu.edu.sg](mailto:AC-SBS-GS@ntu.edu.sg)  Please apply at the following:  **Application portal:** <https://venus.wis.ntu.edu.sg/GOAL/OnlineApplicationModule/frmOnlineApplication.ASPX> |