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| **Research Theme: Biochemistry, Structural Biology** |
| **PhD Research Project Title:** Design and expression of Antibodies, Nanobodies, and Antibody Drug Conjugates for cancer therapy. |
| **Scholarship category (Please indicate the type of scholarship for this project):**   1. **SBS Research Student Scholarship (for SBS faculty only)** 2. **Grant Scholarship: CRP** |
| **Principal Investigator/Supervisor: Julien LESCAR** |
| **Co-supervisor/ Collaborator(s) (if any):** |
| **Project Description**   1. **Background:**   Antibody (Ab)-based therapeutics, including Ab mimics such as antigen binding fragments (Fabs) and nanobodies (NBS), hold enormous potential to treat a wide range of diseases, from cancer to neuropathologies to metabolic diseases, with a market value projected to US$ 300 Billion by 2025. While most Ab therapeutics target extracellular antigens, there is an estimated 6000 potential intracellular targets that are currently considered “undruggable” due to the limitation of Abs to cross the cell membrane. Abs can in principle be designed to target virtually any protein or DNA targets, with high-precision and greatly reduced off-target toxicity compared to small molecule drugs: In this large collaborative project **you will be involved in the development of a platform technology that would enable intracellular delivery of functional Abs with a view to develop therapeutic treatment, with a focus on cancer therapy.**  The project should suit candidates with prior training in Molecular Biology, Biochemistry or Biophysics. Our lab is part of the School of Biological Sciences and the NTU Institute of Structural Biology https://www.ntu.edu.sg/nisb. The lab is fully equipped with state-of-the-art facilities for protein expression (bacterial, mammalian and insect cells), purification (FPLC, HPLC) and structure determination with X-ray crystallography (FR-X generator) and cryo-EM (Titan Krios and Falcon 4 detector).  **b) Proposed work:** The project (title above, part of a large collaborative program) aims to develop novel therapeutics in the form of antibody or nanobody bioconjugates that can be delivered in an intracellular manner. The successful candidate will join an interdisciplinary team with expertise in protein/peptide chemistry, biochemistry and structural biology. He/She will be involved in the design, expression and testing of intracellular binders such as mAbs and nanobodies targeting intracellular targets relevant to cancer.  **c) Preferred skills:** The project should suit candidates with training in Molecular Biology, Biochemistry or Biophysics. |
| **Supervisor contact:**  **If you have questions regarding this project, please email the Principal Investigator:**  **Julien Lescar**  **julien@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> |