<table>
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<tr>
<th><strong>Research Theme</strong>:</th>
<th>Phase Separation and Mechanobiology</th>
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<tr>
<td><strong>Research Project Title</strong>:</td>
<td>Liquid-liquid Phase Separation (LLPS)-regulated plant immunity</td>
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<td><strong>Principal Investigator/Supervisor</strong>:</td>
<td>Nanyang Asst/Prof Yansong Miao</td>
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<td><strong>Co-supervisor/ Collaborator(s) (if any)</strong>:</td>
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**Project Description**

**a) Background:**

This is an interdisciplinary project in studying the function of protein and lipid condensation in plant immunity in the emerging field of LLPS. The PhD candidate will use advanced cell imaging, biochemistry, biophysics, and artificial lipid bilayer-based in vitro reconstitution to study the biological function of a set of protein molecules during pathogen-host interaction. The liquid-liquid, liquid-to-gel, and liquid-to-solid phase transition of proteins has been recently found important for regulating the function of the protein and lipid behaviors during immune-signaling and aging process. We have currently identified several novel molecular and signaling pathways in which the biomolecular assembly is undergoing LLPS for fine-tuning the interactions between pathogen and host species. This multidisciplinary project will also be collaborating with material science, structural biology, and modeling groups to achieve a comprehensive understanding of LLPS-mediated immune-signaling. Highly motivated students are welcome to apply this challenging and exciting project in the LLPS field. As the EMBO affiliated lab, the successful candidate will receive rigorous training in these areas and have opportunities to learn top-notch biological systems from EMBO or EMBL workshops/courses.

**b) Proposed work:**

We have several promising candidate pathways to understand how the cell regulates host immunity through LLPLS for actin assembly and lipid compartmentalization. We are currently using an integrated approach to address the above questions, including a novel in vitro reconstitution system, fluorescence imaging-based cell biology, biophysics, genetics, and biochemistry methods. (please see more details at http://www.ntu.edu.sg/home/yansongm)

**Supervisor contact:**

If you have questions regarding this project, please email the Principal Investigator:

yansongm@ntu.edu.sg

**SBS contact and how to apply:**

Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg

Please apply at the following:

http://admissions.ntu.edu.sg/graduate/R-Programs/R-WhenYouApply/Pages/R-ApplyOnline.aspx