NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Biological Sciences

Reg. No. 200604393R

Research Theme: **Cell Biology / Biochemistry**

Research Project Title: **The role of the endoplasmic reticulum in age-related macular degeneration (AMD)**

Principal Investigator/Supervisor: **Asst Prof Guillaume Thibault**

Co-supervisor/ Collaborator(s) (if any): **NA**

Project Description

BACKGROUND

Under normal growth conditions, the endoplasmic reticulum (ER) stress response is necessary for cellular homeostasis, while the unfolded protein response (UPR) dysregulation is correlated with numerous pathologies, including neurodegenerative diseases, metabolic disease, cancer, and many ocular diseases including age-related macular degeneration (AMD). AMD is a human disease that is currently one of the leading causes of visual disabilities, affecting 3 in 100 Singaporeans (~170 million people globally). In AMD, the UPR is hyperactivated resulting in the induction of pro-inflammatory and angiogenesis factors; conversely, attenuation of the UPR response potentially reduces retina cell death. However, the mechanism by which the UPR contributes to cell death in aged retina cells and AMD pathogenesis is still elusive.

PROPOSED WORK

Using a well-established aging retina cellular model, the PhD candidate will carry out experiments to characterize the dynamic UPR response *in vivo* through the aging process using confocal microscopy and super resolution fluorescence microscopy to monitor single molecules. To further elucidate the UPR transcriptional program *in vivo*, we will analyze the transcriptome by RNA-sequencing (next generation sequencing). Newly identified factors will be further narrow down using different *in vivo* reporters, including reporters of ER membrane biophysical properties and ER-organelle contact sites. The shortlisted factors will be further investigated using cell biology, genetic, and biochemistry approaches.

The PhD candidate will work together with an experience team of experts. Find more about the Thibault lab at www.thibaultlab.com.

Supervisor contact:

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

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SBS contact and how to apply:

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Please apply at the following:

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