NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Biological Sciences
College of Science

Reg. No. 200604393R

Research Theme: **Cell Biology; Physiology**

PhD Research Project Title:

Regulation of lipolysis and ketogenesis at pathophysiological states and contributions of their dysregulations to the progression of metabolic disorders.

Scholarship category (Please indicate the source of funding for this project):

(a) SBS Research Student Scholarship (for SBS faculty only)

(b) Grant Scholarship (NMRC, MOE Tier 2, NRF, NTU Central RSS etc)

(c) Others

Principal Investigator/Supervisor: Lianggong Ding

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

Project Description

a) Background: The global pandemic of obesity, metabolic dysfunction-associated fatty liver disease, type 2 diabetes and other metabolic disorders poses serious threats to human health and the medical system. Hence, comprehensively understanding the primary pathogenic factors of these disorders is a pressing mission in order that better therapeutic strategies could be developed. The imbalance of lipid anabolism and catabolism is generally believed to be one of the main factors, which necessitates organisms to develop mechanisms for spatiotemporal orchestration of diverse lipid metabolic processes executing in various subcellular compartments. Despite significant advancements in understanding regulation of individual lipid processes and their dysregulations in causing metabolic disorders in past decades, the enigmatic intricacies of spatiotemporal interplay among complicated lipid metabolic processes remain poorly understood in physiological and pathological conditions, thereby hindering the development of novel treatments. Thus, we center on the functions of organelles including mitochondria, peroxisomes and Golgi, in lipolysis and ketogenesis, to explore the potential crosstalk among these subcellular compartments in modulating lipid metabolism and disease progression.

b) Proposed work: Through in vitro hepatocytes and adipocytes, as well as in vivo murine models, we plan to systematically analyze the lipolysis and ketogenesis rates upon exposure to diverse metabolic states, metabolites and chemicals. After pinpointing novel regulatory factors, the lipolytic and ketogenic machineries will be comprehensively examined from the perspective of spatiotemporal distribution, protein posttranslational modification as well as transcriptional alterations. Eventually, the regulation and pathophysiological contributions of the identified novel regulators will be assessed in the wild type mouse and murine models with metabolic disorders so that novel targets or strategies could be unraveled.

c) Preferred skills: Experience in mouse work is a must and protein isolation for posttranslational modification will be a plus for consideration.

Supervisor contact:

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

dinglianggong@gmail.com

SBS contact and how to apply:

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

Please apply at the following:

Application portal:

https://venus.wis.ntu.edu.sg/GOAL/OnlineApplicationModule/frmOnlineApplication.ASPX