

Research Theme: Epigenetics, obesity, metabolic syndrome, proteomics, systems biology
Research Project Title: Elucidating epigenetic regulation in food/diet induced obesity and metabolic syndrome
Principal Investigator/Supervisor: A/Prof Newman Siu-kwan Sze
Co-supervisor/ Collaborator(s) (if any): NA
Project Description
<p>a) Background</p> <p>The prevalence of obesity and its associated metabolic syndrome are rapidly increasing worldwide. Both epidemiological studies and laboratory-based investigations have indicated that diet exerts a critical influence on the epigenetic processes that promote obesity and the metabolic syndrome. In the absence of an effective intervention to stop or reverse the obesity epidemic, the prevalence of obesity-related diseases is expected to increase exponentially in future years. Therefore, it is important to study the diet induced epigenetic changes that trigger the development of obesity and metabolic syndrome so that effective preventive measure and/or epigenetic therapy can be developed to stop the obesity epidemic.</p>
<p>b) Proposed work</p> <p>In order to identify the master regulatory switches that modify the epigenome, we have developed a proteomic method to facilitate detailed profiling of the dynamic changes in the chromatome that occur in response to specific environmental cues such as our diets. This project aims to identify the master epigenetic regulators that modify the epigenome during disease initiation and progression. Since epigenetic changes are induced in a cell type-specific manner, to better study the disease processes at molecular level we will start with <i>in vitro</i> cell lines study; adipocytes, beta-islet cells and hypothalamic cells (central controllers of appetite and energy metabolism). Then the identified molecular targets will be validated with <i>in-vivo</i> animal models. Given the exponential increase in obesity and metabolic syndrome, plasticity of human epigenome, and diet modulated epigenetic play a crucial role in the disease development, this project has considerable potential to improve patient care. This project also represents an exciting opportunity to carry out ground-breaking research into the effects of diet on human health.</p>
<p>Supervisor contact:</p> <p>If you have questions regarding this project, please email the Principal Investigator: sksze@ntu.edu.sg</p>
<p>SBS contact and how to apply:</p> <p>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</p>