**Research Theme:** Molecular Immunology

**Research Project Title:** Functional Characterization and Physiological Significance of SETD3

**Principal Investigator/Supervisor:** Asst/Prof I-hsin Su

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

### Project Description

#### a) Background

SET domain-containing 3 (SETD3) is a lysine methyltransferase (KMTase) that expresses in most tissues and cell types including immune cells. Although SETD3 can regulate transcriptional activation through methylation of Histone lysine 36 (H3K26)\(^1\)\(^-\)\(^3\), our preliminary data show that SETD3 is expressed in the cytosolic compartment in certain hematopoietic lineage cells. The expression levels of SETD3 in hematopoietic lineage cells are up-regulated upon cytokine stimulation and down regulated under various stress conditions. In addition to the SET domain, SETD3 also contains a Rubisco LSMT substrate-binding domain in the C-terminus. It allows binding of the protein to substrates not only to the N-terminal tails of histones, but also the large subunit of the Rubisco holoenzyme complex\(^4\). Given the emerging evidences showing the biologic significance of non-histone protein methylation, characterization and study of physiologic functions of SETD3 will be promising and exciting.

#### b) Proposed work

As setd3 is a newly identified protein lysine methyltransferase, there is only very limited number of related studies. We will first characterize the expression pattern of setd3 in various hematopoietic lineage cells. Meanwhile knockdown/overexpression of setd3 in cell lines and conditional setd3 knockout mice will be established to determine functional implications. Biochemistry approaches will be taken to identify novel setd3 substrates other than histone H3K36.

### References:


### Supervisor contact:
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Please apply at the following: [http://admissions.ntu.edu.sg/graduate/R-Programs/R-WhenYouApply/Pages/R-ApplyOnline.aspx](http://admissions.ntu.edu.sg/graduate/R-Programs/R-WhenYouApply/Pages/R-ApplyOnline.aspx)