Research Theme
Dermatology and Skin Biology

Research Project Title
Targeting Defective Apoptosis Pathway in T-cell Lymphoma of the Skin

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Project Description
Cutaneous T-cell lymphoma (CTCL) is a type of non-Hodgkin lymphoma that affects the skin. The disease is characterized by clonal proliferation of skin-invasive malignant CD4+ T-cells, and impose a significant health burden in Singapore and globally. Despite advances in the characterization of underlying molecular pathways and the availability of limited treatment modalities for CTCLs, an effective, safe and patient-acceptable therapeutic strategy is still an unmet need.

The molecular mechanisms underlying the proliferation of CTCL cells are not fully understood. CTCL cells have defective apoptosis, mainly due to aberrant expression/activity of JAK/STAT signaling pathway; opening the prospective for gene-silencing-based therapeutics. The goal of this project is to better understand disease causing molecular pathways in CTCL, which will aid in developing new therapeutic approaches to treat CTCL. The student will address the following three specific aims:

Aim1: To perform comprehensive molecular and microscopic analyses to validate the up-regulation of selected pathways, including JAK/STAT pathway, in representative CTCL cell lines and in patient samples.

Aim2: To carry out gene silencing of target molecules in CTCL cells and to examine the effect by analysing various cell death/apoptosis parameters.

Aim3: To optimize, develop and maintain a CTCL xenograft mouse model and perform *in vivo* gene silencing of the identified candidate molecules and examine therapeutic efficacy.

We believe, this project will provide critical information about the mechanism that regulates CTCL cell survival and suggest a new safe therapeutic approach for effectively treating CTCL tumours. The knowledge gained through this work will advance the understanding of CTCL that will have broader implications beyond CTCL. The student will work as a team with the collaborators and other lab members to address the current clinical need for improved CTCL therapy. He/she will gain specialized training in cell culture, high content screening, cellular, molecular, biochemical and imaging assays. He/she will write scientific papers that will form the basis of his/her PhD thesis.
Contact Us
If you have questions regarding this project, please email the Principal Investigator.
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