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Introduction

Dr. Chau Yee Ng, MD Ph.D., is a dermatologic surgeon practicing at Chang Gung Memorial Hospital (CGMH). She directs the vitiligo center which incorporates a specialty clinic and pigment research lab. She is currently in charge of the Department of Dermatology and Aesthetic Medicine at CGMH Jen-Ai Branch. She is particularly interested in the diagnosis and treatment discoveries for pigmentary disorders.

Better vitiligo treatment, from the bench to clinical practice

Vitiligo is a psychologically devastating autoimmune driven, chronic pigmentary disorder characterized by white depigmented patches due to the complete loss of melanocytes. The disease course of vitiligo is prolonged and requires lengthy commitment from the patients. Clinical improvements are only noticeable after months to years of treatment. Hence, there is a need for non-invasive diagnosis tools for earlier detection of melanocyte recovery and to monitor treatment response over time. Optical coherence tomography (OCT) has been implicated in the ocular examination and has recently modified into high resolution OCT that allows real-time, non-invasive examination of the skin lesion. We conducted a longitudinal study to investigate the feasibility of high-resolution OCT in the investigation of vitiligo lesions prior to surgical grafting and was able to detect inflammatory cells and features that predicts the outcome of surgical grafting in vitiligo. Furthermore, to further explore the biomarker for medical and surgical intervention, we utilized multiplex cytokine array to study the skin interstitial fluid and plasma of patients with vitiligo and identified a strong positive correlation between IFN-γ, CXCL9, and CXCL10 and Granzyme B with predictors for disease activity and severity. We also further demonstrate that IFN-γ per se causes direct cytotoxicity to melanocytes in vitiligo with early phase apoptosis and ferroptosis cell death which initiates melanocyte destruction cascade. A fully human IFN-γ antibody (EI-001) was isolated using B cell cloning from acquired mycobacteria infection patient with good neutralizing ability. In vitro study showing that EI-001 is capable to reverse the toxicity effect in vitro and the biologic is currently in phase I clinical trial for vitiligo.