Potential Roles of MicroRNAs in Pulmonary Regeneration following Influenza Pneumonia

Tan Kai Sen

Abstract
Recent increases in respiratory infectious diseases as well as airborne contaminants are leading to greater prevalence of lung injury. Therefore, there is an urgent need to discover potential therapeutics to ameliorate pulmonary damage. Here we seek to elucidate miRNAs roles in potentially regulating pulmonary regeneration after influenza-induced damage. To elucidate their potential effects in facilitating lung regeneration after influenza-induced lung injury, mice were infected with a sub-lethal dose of influenza virus strain PR8 at 23 PFU/mice, recovering mice were subjected to miRNA and gene microarray. Subsequently, selected miRNAs (miR-21a and miR-99a) were further selected from the array analysis for in vivo knockdown analysis to access their significance in influenza induced lung repair. Our preliminary in vivo data indicate that miRNAs act as permissive factors to allow lung repair to occur. Furthermore miR-21a and miR-99a may modulate distinct populations of cell types involved in lung repair. In addition, we also observed that infected mice recovered significantly more slowly when miR-21a levels were inhibited. Further investigations into the lung regenerative functions of miRNAs may provide opportunities to better understand their regulation of lung regeneration, and possibly allows the discovery of novel miRNA based lung repair biomarkers and therapeutics.

Biography
Tan Kai Sen obtained his Bachelor of Science (hons.) from NUS in 2011. He majored in Life Sciences and specialized in Biomedical-sciences. Subsequently, he started his Ph.D under supervisions of Assoc. Prof. Vincent Chow (NUS) and Prof. Bevin Engelward (MIT) under department of Microbiology and Immunology and SMART Infectious Disease IRG. His research focuses on host elements and factors involved the modulation and regulation of an influenza infection, and the possibility of utilizing miRNA as the treatment vector of the host elements. As of 2nd Feb will have done 4 years, 6 months, and 2 days of ‘PhDing’. Currently waiting for Thesis defense.

Engineering anti-allergen antibodies as candidate therapeutics for allergic diseases

Chan Jin Hui Sherlynn

Abstract
House dust mite (HDM)-driven allergic asthma represents a serious health concern in tropical countries like Singapore. We sought to investigate the potential of utilizing an allergen-specific monoclonal antibody and its chimeric variants as novel therapeutic agents for HDM-induced asthma. We report the generation of murine monoclonal antibodies (mAbs) against Blo t 5, the major allergen from the common HDM *Blomia tropicalis*. We define the binding epitope of the anti-Blo t 5 mAb and show that it overlaps with a previously reported conformational IgE epitope. Preliminary results reveal that the anti-Blo t 5 mAb is able to antagonize the binding of allergen-specific IgE from a Singaporean cohort of Blo t 5-sensitized patients, suggesting that it is a good candidate for further engineering as a potential antagonist for Blo t 5/IgE associated allergy. The Fc regions of the murine mAbs were modified to specific human IgG subclasses (including IgG1) to address the clinical utility of employing antagonistic IgGs as therapy for IgE-linked hypersensitivity. These data will help to resolve the role of IgG subclasses in the regulation of IgE-mediated allergy and may lead to the production of candidate therapeutics for a common human disease where there remains an urgent unmet clinical need.

Biography
Sherlynn received her Bachelor’s of Science (Hons) from the National University of Singapore in 2011. She was then awarded the NUS Graduate School for Integrative Sciences and Engineering Scholarship (NGSS) and is currently pursuing her PhD under the supervision of Assoc Prof. Paul A MacAry's lab at the Immunology Programme, Department of Microbiology. Her research investigates the possibility of utilizing allergen-specific monoclonal antibodies as potential treatment modalities in allergic diseases, with focus on HDM-derived allergens and allergies.