

## **Background**

The use of steroid is the major treatment to control asthma symptoms; however the side effects are often devastating. Seeking new drugs or new strategies in reducing the dose of steroid taken has always been an important task. A patented whey protein extract (WPE) from bovine that is enriched in growth factor TGF- $\beta$  has been demonstrated with potential for reducing symptoms associated with mild-to moderate T<sub>H</sub>1 mediated psoriasis in human. However whether WPE also has the potential for inhibiting T<sub>H</sub>2 mediated disease is still unclear.

## **Method**

T<sub>H</sub>2-polarized T cells were generated *in vitro*. Concentration of cytokines IL-4, IL-5 and IL-13 in the supernatant from T<sub>H</sub>2 cells that were re-stimulated in the presence of WPE were measured by ELISA. To investigate the effect of WPE *in vivo*, female BALB/c mice aged 6-8 weeks were sensitized and challenged with ovalbumin (OVA) to induce asthma. For the treatment, the mice were orally gavage with WPE daily for 14 days before challenge. Regulatory T cells were identified using Mouse Regulatory T cell Staining Kit followed by flow cytometry analysis.

## **Result**

Daily feeding the mice with WPE for 14 days before challenge was able to inhibit airway inflammation, serum OVA-specific IgE and airway hyperresponsiveness. In the presence WPE, an increased in regulatory T cell population *in vitro* and *in vivo* were observed. Moreover, the production of IL-4, IL-5 and IL-13 and the expression of T<sub>H</sub>2 master transcription factor GATA3 by stimulated T<sub>H</sub>2 cells were reduced when T<sub>H</sub>2 cells were cultured with WPE. Using TGF- $\beta$  blocking antibody, we further identified that TGF- $\beta$  is the main component in the WPE that exert the inhibitory effect.

## **Conclusion**

Our data suggested that WPE has a potential to alleviate the syndromes of asthma by regulating T<sub>H</sub>2 cell functions. Therefore, taking WPE regularly might be beneficial to asthma patients.