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**Male-dominant suppressive activity of CD8<sup>+</sup> T cells on CD4<sup>+</sup> T cells: Assessing female-dominant allergic airway inflammation**Tomomitsu Miyasaka<sup>1</sup>, Chiaki Masuda<sup>1</sup>, Toshiaki Kikuchi<sup>2</sup>, Tasuku Kawano<sup>1</sup>, Motoaki Takayanagi<sup>1</sup> and Isao Ohno<sup>1</sup><sup>1</sup>Tohoku Medical and Pharmaceutical University, Japan<sup>2</sup>Niigata University, Japan

**Statement of the Problem:** Bronchial asthma is more severe in females than in males after puberty because of stronger Th2-oriented immune response in females. However, the mechanism of the sex difference in asthmatic immune response remains unclear. CD8<sup>+</sup> T cells play an important role in regulating the asthma immune response through their suppressive effect on Th2 polarization within the localized lymph nodes.

**Theoretical Orientation:** In the present study, we investigated the sex-specific effect of CD8<sup>+</sup> T cells on the female-predominant asthmatic immune responses using a mouse model.

**Results:** The number of eosinophil in bronchoalveolar lavage (BAL) fluid, lung Th2 cytokine levels, and IL-4 production by bronchial lymph node cells were significantly higher in wild-type female compared with male mice, whereas no such sex differences were observed between cd8 $\alpha$ -disrupted (CD8KO) male and female mice. The adaptive transfer of wild-type male, but not female, CD8<sup>+</sup> T cells reduced the number of inflammatory cells in the recovered BAL fluid of CD8KO male, but not female, recipient mice. Male CD8<sup>+</sup> T cells produced higher levels of IFN- $\gamma$  than female CD8<sup>+</sup> T cells. Treatment with anti-IFN- $\gamma$  antibody completely abrogated the sex difference in the suppressive activity of CD8<sup>+</sup> T cells on IL-4 production from CD4<sup>+</sup> T cells. However, IFN- $\gamma$  receptor expression on CD4<sup>+</sup> T cells was higher in male mice than in female mice. rIFN- $\gamma$  treatment increased the proportion of IFN- $\gamma$  receptor  $\alpha$ + CD4<sup>+</sup> T cells in male naïve CD4<sup>+</sup> T cells more than in female naïve CD4<sup>+</sup> T cells.

**Conclusion & Significance:** These results suggest that female-dominant asthmatic immune responses are induced by the reduced production of IFN- $\gamma$  by CD8<sup>+</sup> T cells and the lower expression of IFN- $\gamma$  receptor on CD4<sup>+</sup> T cells caused by exposure to IFN- $\gamma$  in females compared with males.

**Biography**

Tomomitsu Miyasaka completed his PhD at Tohoku University, Japan. He is an Assistant Professor at Tohoku Medical and Pharmaceutical University, Japan. His research area is Allergy, and he is interested in determining the mechanism(s) that are responsible for the altered asthma severity by sex or related to psychological stress.

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