My graduate studies had been started by a research on the effect of feeding behavior and light-dark cycle on immune cell populations in blood of mice. It was shown in this research that all of B, T and NK cell populations in blood were increased by feeding, and that the variation of B and NK cells except T cells was synchronized with the reversed light-dark cycle. It was extended to investigate the effect of some phyto-materials on behavioral indicators for learning and memory and on immune cell balance in Senescence-accelerated mice (SAM). As the result some phyto-materials were found to prevent the SAM mice from declining of behavioral activities and immune depression with aging.

Now in the Hatano Research Institute, I am engaged in the study about developing an in vitro assay system for assessment of food allergenicity using Peyer’s patch cells. I will make an effort to the utmost so as to be like research experts in immunology and toxicology.
Indoor and outdoor pollutants may be associated with health problems. Ozone is one of the outdoor pollutants and it is suggested a positive relationship between low-level ozone exposure and increased incidence of allergic diseases in developed countries.

Little is known about the mechanism of action of ozone to induce allergic responses and its susceptible subpopulation. However, there are rapidly growing evidences suggesting that ozone can modify airway inflammatory responses by disrupting the anti-oxidant mechanism that may regulate the nervous and immune functions.

Here, based on the data from animal experiments, I summarized the role of ozone in the induction of lung injury and airway inflammation and then discussed the susceptibility to toxic chemical exposure and predisposing allergic and infectious diseases. I also consider the possible mechanisms by which ozone exposure can induce the symptoms presenting in patients with airway hyperactivity.

Exposure to an allergen and/or toxic chemical ozone leads to epithelial cell irritation and it triggers cytokine production from these epithelial cells and alveolar macrophages.

In this review, I have highlighted the potential inflammatory mediators that influencing airway hyperreactivity by ozone inhalation and I hope this review, at least in part, help to understand the mechanisms of allergic diseases caused by chemicals around us.