GS03-1 Role of deubiquitination enzyme Ubp6 as a determination factor of methylmercury toxicity

◯Yukiyoshi KIMURA[1], Gi-Wook HWANG[1], Akira NAGANUMA[1]

[1]Grad. Sch. of Pharm. Sci., Tohoku Univ.

Methylmercury is a toxic heavy metal compound known as the causative agent of Minamata disease. However, mechanisms of methylmercury toxicity and cellular protective mechanisms against such toxicity remain poorly understood.

We have demonstrated that the ubiquitin-proteasome system (UP system), a selective proteolytic pathway, plays an important role in determining the sensitivity to methylmercury in yeast cells and human cells. Recently, we found that the yeast cells lacking Ubp6, one of the deubiquitination enzyme, are resistant to methylmercury. Ubp6 is known to be located in the proteasome. The activity of proteasome was found to be necessary for acquisition of resistance to methylmercury in Ubp6-deficient yeast. On the other hand, we have identified Whi2 as a protein that enhances methylmercury toxicity and demonstrated that the cellular levels of Whi2 protein were regulated by the UP system. In the present study, we observed that the level of Whi2 protein in Ubp6-deficient yeast cells is very low, and that this phenomenon participate in acquisition of resistance to methylmercury. In this symposium, I will introduce the results of our recent research concerning the participation of Whi2 in acquisition of resistance to methylmercury in Ubp6-deficient yeast and the role of Ubp6 as a determination factor of methylmercury toxicity.