

Investigation of the Effect of Salt Intake-Mediated Dysbiosis on the Sensitivity to Viral Infectious Diseases

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Summary

Salt crucially affects human body and can be the triggers of several disorders such as high blood pressure. Additionally, it has been recently revealed that salt intake is closely associated with human homeostasis including intestinal flora and potently causes "dysbiosis". "Dysbiosis" means the destruction of the balance of intestinal flora and can break the immuno-homeostasis leading to affect the sensitivity and resistance to infectious diseases. However, the effect of the dysbiosis caused by salt intake on the sensitivity and resistance to infectious diseases is unrevealed.

To investigate the association of virus infection, salt intake and the dysbiosis caused by infection and/or salt, we used a hematopoietic stem cell-transplanted "humanized mouse" model. Our "humanized mouse" is susceptible to the infection of human immunodeficiency virus (HIV), which is a human-specific pathogenic virus and the causative agent of acquired immunodeficiency syndrome, and is able to reproduce the disorders observed in infected individuals. By using HIV-infected humanized mice, we investigated the effect of virus infection on the intestinal flora.

We inoculated HIV into four humanized mice and obtained the stools at six weeks post-infection. We also obtained the stools of four uninfected humanized mice. We then extracted DNA from these stools and performed 16S rRNA sequencing analysis to determine the intestinal flora. Through the bioinformatics analyses of the 16S rRNA sequence data, we found that the family *Enterobacteriaceae* is predominant in the intestinal flora of HIV-infected humanized mice.

As our findings correspond to the previous observations in HIV-infected individuals, these results suggest that our experimental system using humanized mice and HIV is an ideal platform to investigate the effect of human-specific pathogenic virus infection on intestinal flora. By using this platform, we will investigate the effect of salt intake on the sensitivity/resistance to virus infection which is closely associated with intestinal flora and *vice versa*.