Evaluation the Effect of Chlorogenic Acid on the Bitterness of Medicines
T. Haraguchi, S. Kanemitsu, M. Hazekawa, M. Yoshida, T. Uchida
Mukogawa Women's University

Purpose
We have been reported that the bitterness of rebamipide could be decreased by coffee in our previous study. The purpose of this study was to clarify how coffee works on to the bitterness inhibition. We focused on the components of coffee; chlorogenic acid which is ester of caffeic acid and quinic acid. In this study, the effects of chlorogenic acid, caffeic acid or quinic acid on the bitterness of rebamipide or some medicines were evaluated using taste sensor system.

Methods
Taste sensor SA402B (Intelligent Sensor Technology Inc., Atsugi, Japan) was used for this study. Lipid/polymer membrane of AE1 was used to evaluate the bitterness of rebamipide. Rebamipide was dissolved in phosphate buffered saline (PBS). Taste sensor AE1 outputs of rebamipide with or without chlorogenic acid were measured. Furthermore, caffeic acid and quinic acid were also investigated if they contribute to the inhibition of the bitterness of rebamipide. The bitterness suppressions of other medicines such as amlodipine, donepezil, diclofenac were also measured.

Results
Taste sensor AE1 output of rebamipide was decreased in dose dependent manner to chlorogenic acid. In human sensation test, the bitterness score of rebamipide was decreased by adding chlorogenic acid. There were good correlations between taste sensor AE1 outputs and the scores of human sensation test of rebamipide with or without chlorogenic acid. Bitterness level of chlorogenic acid itself was so little within our experimental dose range. Furthermore, not quinic acid but caffeic acid indicated similar effect of suppressing the sensor output of rebamipide. These effects were just as valid for other some medicines.

Conclusion
It was suggested that the bitterness of medicines could be inhibited by chlorogenic acid. We also found that caffeic acid suppressed the taste sensor output of bitter medicine as same level as chlorogenic acid did. It was thought that coffee component such as chlorogenic acid or its hydrolysate caffeic acid made a role in inhibiting the bitterness of medicines. These findings suggest that chlorogenic acid or caffeic acid would become the bitterness inhibiting substance for medicines.