Effects of increased sodium appetite on neural activities in the gustatory cortex of monkeys during the salt-water discrimination GO-NOGO task. -Possible modification of activities of cortical taste neurons in monkeys by intraventricular adminitration of angiotensin II-

Hisashi Ogawa, Shin-ichi Ito, Miki Ohgushi and *Hirotoshi Ifuku
Department of Physiology, Kumamoto University Medical School, and
*Department of Health and Physical Education, Faculty of General Education, Kumamoto University.

Summary

Two Japanese macaques (macaca fuscata), who had been trained to perform a salt-water discrimination GO-NOGO task the last year, were used. In this task, 0.1 M NaCl (0.5cc) given to the mouth was a cue for lever pressing (GO task), and water (0.5cc) a cue for a NOGO task. For the correct response the monkey received 0.3 M sucrose (0.5cc) as a reward. Evarts-type cylinders were aseptical ly implanted on the skull under anesthesia with nembutal and ketamine. A 16 bit microcomputer-based device was developed to control the task and collect neural data from cortical neurons and reaction times from cues to lever pressing.

Several types of task-related neurons were obtained from the frontal operculum of the monkeys. Some differentially responded to different kinds of cues, i.e, NaCl or water. Effects of intraventricular administration of angiotensin II (AII;Peptide Institute, human, 5 ug in 20 ul/5 m) were studied on the activities of the cortical neurons. Some of the task-related neurons changed the response magnitude to cue stimuli for a short period after the AII administration. A tendency was noted that water responses were increased, while NaCl responses decreased. This may conform to the finding obtained the last fiscal year that monkeys could not differentiate low concentrations of NaCl from water after the treatment. Spontaneous discharges during the trial intervals were also increased which suggests increased attention of monkeys to cue-stimuli.

It is desired to record much more neurons from the frontal operculum of the monkeys during the GO/NOGO task, and to histologically locate the task-related neurons modified by intraventricular administration of AII. This can lead to cla rification of the neural mechanism by which intraventricular AII causes behavior al changes in NaCl-water discrimination task disclosed the last fiscal year.