Ghrelin receptor in two species of anuran amphibians

Hiroyuki Kaiya[1], Yasushi Koizumi[2], Norifumi Konno[2], Minoru Uchiyama[2], Kenji Kangawa[1] and Mikiya Miyazato[1]

[1]Department of Biochemistry, National Cerebral and Cardiovascular Center Research Institute, Japan, [2]Department of Biological Science, Graduate School of Science and Engineering, University of Toyama, Japan.

We identified ghrelin receptor (GHS-R1a) in bullfrog (*Rana catesbeiana*) and Japanese tree frog (*Hyla japonica*). Each receptor is consisted of 374- and 371-amino acids, respectively, and the sequence identity of the two receptors was 85% and 61-74% with ghrelin receptors of other vertebrates. The receptor proteins that expressed in mammalian cells were functional: ghrelin or receptor agonists increased intracellular calcium concentrations. High expression levels of the receptor mRNA were detected in the brain, intestine, kidney and testis of the bullfrog, and in the brain, heart, intestine, kidney, gall bladder, and ventral skin of the Japanese tree frog. Ghrelin exhibits an anti-dipsogenic effect in eel, chicken and rat. However, in the Japanese tree frog, intracerebroventricular injection of ghrelin did not show any effect on water absorption from the ventral skin. Further study needs to clarify the physiological relevance of ghrelin in amphibians, based on the distribution of ghrelin receptor that demonstrated in the present study.