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学位授与の要件 信州大学学位規程 第5条第1項該当

学位論文題目 Histological studies on the mechanisms for the regulation of glucagon-like peptides (GLPs) in the chicken small intestine  
(ニワトリ小腸におけるグルカゴン様ペプチド (GLPs) の  
分泌制御機構に関する組織学的研究)

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## 論文内容の要旨

The mechanisms of secretion of glucagon-like peptides (GLP-1 and GLP-2) were investigated using the morphological techniques in this dissertation. These meal-induced peptides show lots of important physiological actions and are related with intestinal activities. GLP-1 is one of the incretin hormones and relates to the intestinal motility. GLP-2 is one of the intestinotrophic peptides and stimulates the intestinal growth. Following points were clarified in this dissertation.

1. GLP-1 and GLP-2 were colocalized in the same endocrine cells, L cells, using double immunofluorescent technique. L cells showing GLP-1 immunoreactivity only were observed in the epithelium of the middle part of intestinal villi. These results indicate that GLP-1 and GLP-2 are secreted from the same cells separately.
2. Restricted feeding influenced on the distribution and morphology of GLP-1- and GLP-2-immunoreactive cells in the chicken small intestine. The control and two experimental groups (50% and 25% feed supply) were set in this study. The frequency of occurrence of cells showing immunoreactivity for GLP-1 or GLP-2 was significantly increased in 25% feed supply group. These results indicate that the quantity of feed intake is one

of the signals stimulating the secretion of GLPs from intestinal L cells.

3. Protein ingestion influenced on the frequency and morphology of GLP-1- and GLP-2-immunoreactive cells in the chicken small intestine. The control (CP18%) and three experimental groups (CP9%, 4.5% and 0% feeding groups) were set in this study. Low protein ingestion induced morphological alterations of GLP-1- and GLP-2-immunoreactive cells. Frequencies of GLP-1- and GLP-2-immunoreactive cells were significantly decreased in lower protein groups (CP 4.5% and 0%) compared with the control group. These results indicate that the protein ingestion is one of the strong stimuli to the GLPs secretion.

In conclusion, it is revealed that GLPs secretion from intestinal L cells is controlled by the quantity and quality of feed in chickens. Moreover, it is likely that GLP-1 and GLP-2 are secreted from the same cells separately. This dissertation discovered important aspects of GLPs that has not previously been reported in chickens.