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A role of neuromedin U in pig immune regulation

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Statement of the Problem: Neuromedin U (NMU) is a conserved mammalian neuropeptide discovered in the 1980s and found in two forms, NMU-25 and NMU-8. Wide distribution of NMU in animal organs suggests that NMU is involved in multiple physiological functions, including immune regulation. However, the role of NMU in pig immune regulation has not been reported.

Methodology & Theoretical Orientation: To study the effect of NMU on pig immune regulation, we cloned and detected the expression of NMU and its receptors in pig lymphatic organs and immune cells. We also investigated the effect of NMU on cytokine secretion after injection of (0, 5, 15, 45 nmol) NMU into the intracerebral ventricle (i.c.v) of 16 pigs (n=4 for each group) and the effect of (0.1~1000 nM) NMU on cytokine secretion in cultured dendritic cells and natural kill (NK) cells using ELISA and RIA methods.

Findings: NMU and its receptors were expressed in lymphatic organs, cultured dendritic cells and NK cells. NMU stimulated IL-1 β , IL-6, IL-8, TNF- α and IL-10 secretion ($P<0.05$) post-injection in a time- and dose-dependent manner, compared with the control group. NMU increased IL-8, IL-6 and IL-13 secretion and reduced IL-10 secretion ($P<0.05$) in cultured dendritic cells. NMU enhanced the killing activity of cultured NK cells, stimulated IFN- γ secretion *via* PLC, PI3K and MEK signal pathways and inhibited IL-10 secretion ($P<0.05$) in NK cells in a time- and dose-dependent manner.

Conclusion & Significance: This study suggests that NMU has the role in pig immune regulation through its effect on cytokine secretion and increasing killing activity of NK cells.

Recent Publications

1. Lei Zhihai, Lei Ruipeng, Li Xiang, et al (2014) Advance in neuro-medin U. Animal Husbandry & Veterinary Medicine 46: 121-125. In Chinese.

Biography

Zhihai Lei is a Professor working at Nanjing Agricultural University (NAU), Nanjing, Jiangsu, China. His research fields are neuroanatomy and neuroendocrine of domestic animals and pay more attention to roles of newly discovered neuropeptides in reproduction and immune regulations.

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