

Is Ghrelin a Natural Anti-Microbial Agent?

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Ghrelin, a 28-amino acid peptide hormone, was first discovered in stomach extracts of rats and humans. Later this hormone was found to be present in other tissues and biological fluids as well. Its structure in mammals, birds and fish shows that there is a short-chain fatty acid octanoyl (caprylic group) attached to ser3, while in amphibians at the same position there is a threonin, acylated with the same short-chain fatty acid. This modification seems to be essential for the activity of the hormone (i.e. its effect in GH release and appetite). However, it has been indicated that the non-acylated (desoctanoyl) form of ghrelin circulates in far greater amounts than the acylated form (1,2).

Ghrelin is also the first-known example of a bioactive peptide bearing caprylic acid (octanoic acid) groups (1). Caprylic acid is used in the treatment of some bacterial infections such as candidiasis. With its relatively short chain length, this fatty acid has no difficulty in penetrating (and crossing) cell membranes (3,4). Whether caprylic acid covalently-linked to ghrelin has the same kind of effect is not yet known.

In addition to its main functions of up-regulation of body weight through appetite control, increased food intake, down-regulation in energy expenditure, and induced adiposity (1,2), here we hypothesize that ghrelin might have anti-microbial properties. Supporting this notion, it has been reported that intensive care unit patients associated with some kinds of bacterial infections showed a significantly lower level of ghrelin than the healthy controls (5). Given the growth of certain lipid-coated bacteria, such as *Staphylococcus aureus*, under conditions where ghrelin level is below a certain critical level, this hormone might act as a natural anti-bacterial agent. However, this issue warrants further studies for a plausible explanation.

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References

1. Kojima M, Kangawa K. Ghrelin: structure and function. *Physiol Rev* 2005; 85: 495-522.
2. Aydin S. Discovery of ghrelin hormone: research and clinical applications. *Turk J Biochem* 2007; 32: 76-89.
3. http://www.fungusfocus.com/html/caprylic_acid.htm
4. Nair MK, Joy J, Vasudevan P, Hinckley L, Hoagland TA, Venkitanarayanan KS. Antibacterial effect of caprylic acid and monocaprylin on major bacterial mastitis pathogens. *J Dairy Sci* 2005; 88: 3488-95.
5. Nematy M, O'Flynn JE, Wandrag L, Brynes AE, Brett SJ, Patterson M et al. Changes in appetite related gut hormones in intensive care unit patients: a pilot cohort study. *Crit Care* 2006; 10: R10.

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