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Direct Regulation of the Lobster Mandibular Organ by Sinus Gland Peptides

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Poster Presentation 21

**DIRECT REGULATION OF THE LOBSTER MANDIBULAR ORGAN
BY SINUS GLAND PEPTIDES.**

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Methyl farnesoate (MF) is a crustacean compound that is similar chemically to juvenile hormone, which regulates insect growth and reproduction. This similarity has led to the suggestion that MF may have juvenile hormone-like effects in crustaceans. If this is so, regulation of MF levels might be an important mechanism in the control of crustacean molting and reproduction. The understanding of, and ability to manipulate, the regulation of MF production could be a powerful tool in the aquaculture of economically important crustaceans.

In the lobster *Homarus americanus*, MF synthesis occurs in the mandibular organ (MO). *In vivo* studies have shown that MF synthesis is negatively regulated by the sinus gland (SG), a structure located in the crustacean eyestalk and known to produce neuropeptides. To determine the effect of these peptides on MF synthesis, fragments of MO tissue were incubated in DMEM culture medium supplemented with radiolabeled methionine (a precursor of MF). I used this *in vitro* bioassay to compare the activity of a crude SG extract with that of two peptides purified from the extract. The crude SG extract produced an 80% decrease in MF synthesis by MO fragments when compared with controls. One of the purified peptides also inhibited MF synthesis, but the other had no effect. The data suggest that the first peptide is the MOIH (mandibular organ inhibiting hormone) for the lobster. However, its inhibitory effect on MF production is not as complete as that of the crude SG extract, suggesting that this peptide may act synergistically with another compound from the SG to produce full inhibition. Attempts are being made in our lab to purify MOIH and to determine its sequence.