TECHNOLOGY SUMMARY

SUBTILOMYCIN – A NOVEL MARINE-DERIVED ANTIBIOTIC FOR AQUACULTURE APPLICATIONS

Bacillus subtilis strain MMA7, isolated from the marine sponge *Haliclona simulans*, displays a broad spectrum of activity against gram-positive and gram-negative marine pathogens including *Aeromonas hydrophila* and *Vibrio anguillarum* as well as several species of *Candida*. The active component has been isolated and identified as Subtilomycin, a novel lantibiotic with a potential application as a probiotic feed additive for the aquaculture business.

VALUE PROPOSITION

In large-scale aquaculture facilities, problems related to bacterial disease often occur and can result in serious economic losses. The quest for novel antimicrobial compounds from the marine environment has been driven by a widespread resistance to antibiotics and emerging multi drug resistant pathogens. Subtilomycin, a novel lantibiotic derived from the marine sponge *Haliclona simulans* is water soluble, heat and pH stable and displays a broad range of activity against microbial and some fungal pathogens. The spore-forming nature of the *Bacillus* strain makes this product highly suitable for incorporation into aquaculture feed.

THE TECHNOLOGY

Subtilomycin is a novel lantibiotic with a unique m/z of 3235.6. Based on MS, MS/MS and genome sequence analysis the subtilomycin precursor undergoes extensive post-translational modification. The proposed subtilomycin biosynthetic gene cluster appears to have several of the sequence features associated with class I lantibiotics including the presence of LanP, LanB and LanC-like encoding sequences immediately downstream from the structural gene subA. Despite the abundance and broad range of mechanism of antimicrobial compounds produced by the marine sponge microbiota, to the best of our knowledge, subtilomycin is the first lantibiotic to be purified and identified from a marine sponge associated bacteria.

Indicators	**Deferred antagonism assay**
B. cereus	+++
B. megaterium	++++
L. monocytogenes	++++
C. sporogenes	+++++
C. perfringens	++++
C. difficile	++
E. faecium	++
S. aureus	++
MRSA	++
L. lactis HP	++++
A. hydrophila	++++
V. anguillarum	+
Alteromonas sp.	+++
C. albicans	++++
C. dubliniensis	++
C. lusitaniae	++
C. parapsilosis	+

Table 1. Antimicrobial activity of B. subtilis strain MMA7

DEVELOPMENT STATUS

- Ready for *in vivo* trials

FIELD OF APPLICATION

- Probiotic in finfish/shellfish aquaculture feed

CONTACT

To arrange a meeting or teleconference with the University for preliminary discussions, please contact DEREK JOHN at Tel:+353 21 4901728, email: derek.john@ucc.ie

Web: http://techtransfer.ucc.ie