

Role of lipocyclopeptides PAXs from the entomopathogenic bacterium *Xenorhabdus*

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Résumer (10-15 lignes max, calibre 12, interligne 1,5) :

Microorganisms have to produce a variety of molecules to cope with environmental changes. *Xenorhabdus* is an entomopathogenic bacterium involved in symbiotic relationship with *Steinernema* nematodes. *Xenorhabdus* also produces different specialized metabolites during its complex life cycle: i) pathogenic phase within insect larvae, ii) necrotrophic phase in the insect cadaver, and iii) symbiotic phase with its nematode host (Tobias *et al.*, 2017). PAXs (Peptide Antimicrobial from *Xenorhabdus*) are a family of NRPS lipocyclopeptides produced by almost all *Xenorhabdus* strains (Gualtieri *et al.*, 2009; Fuchs *et al.*, 2011). Besides their antimicrobial activities against Gram-positive bacteria and phytopathogenic fungi, little is known about the ecological role of PAXs in the life cycle of *Xenorhabdus*, which this work aims to investigate. The involvement of PAXs in motility and biofilm formation has been demonstrated *in vitro*. Reassociation of aposymbiotic nematodes with a PAX defective mutant of *Xenorhabdus* resulted in weaker nematode progeny production. Overall, these results suggest that PAXs could be adaptation metabolites to a changing environment from insect cadaver to the nematode and/or nutritional deprivation in the insect cadaver.

Références:

Fuchs, S.W., Proschak, A., Jaskolla, T.W., Karas, M., and Bode, H.B. (2011) Structure elucidation and biosynthesis of lysine-rich cyclic peptides in *Xenorhabdus nematophila*. *Org Biomol Chem* 9:3130.

Gualtieri, M., Aumelas, A., and Thaler, J.-O. (2009) Identification of a new antimicrobial lysine-rich cyclolipopeptide family from *Xenorhabdus nematophila*. *J Antibiot* 62: 295–302.

Tobias, N.J., Wolff, H., Djahanschiri, B., Grundmann, F., Kronenwerth, M., Shi, Y.-M., et al. (2017) Natural product diversity associated with the nematode symbionts *Photorhabdus* and *Xenorhabdus*. *Nat Microbiol* 2: 1676–1685.