

EVIDENCE OF PHOSPHOLIPASE D LATERAL TRANSFERENCE BETWEEN BACTERIA, SPIDER AND FUNGI

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Phospholipase D (PLD) gene product is able to hydrolyse sphingomyelins ester bonds present in mammalian cell membranes. *Corynebacterium pseudotuberculosis*, *Corynebacterium ulcerans* and *Arcanobacterium haemolyticum* are pathogens and their virulence is associated with the production of PLD exotoxin. It has been proposed that *Loxosceles* acquired PLD by lateral transfer from bacteria. PSI-BLAST searches using *C. pseudotuberculosis* PLD found homologues in the bacterial and spider species above, and additionally in the fungi sub-phylum Pezizomycotina (e.g. *Coccidioides immitis* and *Aspergillus oryzae*). Searches in translated dbEST database found transcripts from additional Pezizomycotina fungi and in the spider *Acantoscurria gomesiana*. Searches in translated WGS sequences revealed additional Pezizomycotina sequences. Taken together, our results limit the presence of PDL gene to a phylogenetically related group of bacteria and fungi, besides the two spider genera. Neighbor-joining trees (bootstrap 83.7%) separates the bacterial copies from fungi/spider sequences. However, similarity scores between fungi-bacteria homologues were around 45-55%, as opposite to 18-23% between either fungi-spider or bacteria-spider sequences. Thus, we propose that lateral PLD transfer has included Pezizomycotina sub-phylum as intermediary of the lateral transference between a restrict group of *Corynebacterium* and spider species.