

## XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

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Centro cultural y Pabellón Argentina de la Universidad Nacional de Córdoba, Córdoba, ARGENTINA.



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## **NEUROTRANSMITTER-PRODUCING BACTERIA IMPACT OUR NEUROSYSYSTEM**

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Trace amines (TA) are neurotransmitters (NTs) endogenously produced in mammals. However, they are also produced by bacteria belonging to the human microbiota. In many bacterial species TAs are produced by aromatic amino acid decarboxylases (AADCs). The TAs are secreted and can interact with the host. Objective: Have NTs produced by commensal bacteria have an impact on the neurosystem? Result: Some bacterial AADCs, like SadA, have a broad spectrum of activity; they can decarboxylate tryptophan, tyrosine, phenylalanine, dihydroxy phenylalanine (L-DOPA) and 5-hydroxytryptophan (5-HTP) to tryptamine (TRY), tyramine (TYM), and phenethylamine (PEA), dopamine (DOP) and serotonin. Metagenomic analysis of the human skin microbiota revealed that SadA-type AADCs are widespread particularly in the phyla Actinobacteria, Proteobacteria, Firmicutes, and Bacteroidetes. Many of the genera that have this AADC-type belong to the classical skin and gut microbiota. The potential interaction of NT-producing bacteria with the host has been studied with *Staphylococcus epidermidis* as an example. Their secreted NTs trigger the internalization by human cells by activation of the  $\alpha_2$ -adrenergic receptor ( $\alpha_2$ -AR). Moreover, NTs alone and a TA-producing *S. epidermidis* strain accelerate wound healing by antagonizing the  $\alpha_2$ -adrenergic receptor ( $\alpha_2$ -AR) in keratinocytes. Since, at least in staphylococci, aromatic amino acids are almost completely converted to TAs which are secreted, a comparatively high concentration accumulates in the environment where they can exert presynaptic "amphetamine-like" effects. Whether microbiota-derived NTs also play a role in neurological disease is currently a hot topic.

Palabras clave: palabras\_clave