Genetic Elements in Enterococcus spp. to Produce Dopamine

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Technology description

Summary:
This disclosure provides a biotechnological approach to produce dopamine as well as a method to screen for probiotics.
Description:
In this disclosure, ISU researchers report the identification of a Enterococcus spp tyrosine decarboxylase gene and other genomic regions for the production of dopamine. Dopamine is a mammalian neurotransmitter of the CNS made from L-DOPA by L-DOPA decarboxylase and used as a therapeutic for the treatment of heart failure and shock, especially in newborn babies. The worldwide production of dopamine is in the hundreds of millions of dollars. That need is expected to increase dramatically in the coming years as the use of polydopamine surface chemistry is poised to make large inroads in fields ranging from new adhesives materials for rechargeable batteries to nanovaccine construction. Any improvement in the manufacture of dopamine leading to lower production costs is predicted to be of interest to industry.
Probiotics are live organisms that confer beneficial health effects to human and animals. They may be used for both maintenance of gut health as well as treatment of specific clinical conditions ranging from gastrointestinal infections to the treatment of neuropsychiatric-related behavioral issues. Probiotics are also extensively used in the production of food animals and in the treatment of companion animals. In addition to gene sequences, this disclosure provide a method to identify dopamine-producing bacteria with potential to be used as probiotics.

Advantages

- Potential for the biotechnological production of dopamine
- Screening method to identify new dopamine-producing bacterial strains
- Tangible materials for the construction of improved dopamine-producing strains
- Potential for a dopamine production method that is superior to the standard chemical synthesis method

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