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Probiotic strains of *Lactococcus lactis* subsp. *lactis* are stimulated by neuroactive biogenic amines and produce them and their precursor

The neuromediators epinephrine (adrenaline), dopamine and serotonin stimulate at a concentration of 1M the growth of some strains of *Lactococcus lactis* subsp. *lactis*, a popular probiotic species that is widely used in functional food items. The growth of the strain L. *lactis* subsp. *lactis* 194c is threefold accelerated by all the three neuromediators. Epinephrine and serotonin produced no statistically significant effect on the growth of the other strains tested (K-205, 729 and F-116). Dopamine increased the growth of K-205 and 729 but not of the fusion strain F-116. It is known that neuromediators accumulate in the bloodstream and in the intestinal lumen of stressed individuals, especially if the stress is accompanied by local intestinal inflammation. Therefore, it is in a stressed organism that the tested probiotic strains are expected to grow particularly fast. This fact is of indesputable medical interest because probiotics including L. *lactis* subsp. *lactis* help the organism cope with stress. Using HPLC with an amperometric detector, it was established that strains K-205 and F-116 produce submicromolar amounts of their own dopamine and of its precursor, 2,3-Dihydroxyphenylalanine (DOPA). DOPA passes the gut–blood and the blood–brain barriers. Therefore, such DOPA-producing probiotic cultures could be applied, in the form of drugs or fermented dairy products for the purpose of improving the physical and mental health state of patients with neurological disorders including Parkinson's disease.

Biography

Alexander V Oleskin completed two dissertations (for the Ph. D. and the Doctor of Science Degree) at Moscow State University and was awarded the Full Professor (in Biology) title in 2013. His research focus has been on the role of biogenic amines in the interaction between the microbiota, including probiotics and the host organism. He is currently lecturing on (i) Intercellular Interations, (ii) Microbial Neurochemicals and (iii) Decentralized Network Structures. He has published several monographs and more than one hundred papers in reputed journals and has been serving as an editorial board member of several local and international scientific journals.

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