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Cytokine analysis to differentiate immunomodulatory properties of *Lactobacillus paracasei* strains and for the identification of potentially unsafe strains

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A number of studies provided evidence that the probiotic aptitude of bacteria is strictly strain-specific; therefore even strains of the same species may show peculiar behaviors inducing different immune responses. The aim of this study was the comparison of five genetically characterized *Lactobacillus paracasei* strains to reveal their immunomodulatory properties and the potential relationship between the immune response and their different behaviors. Based on their characteristics, probiotic strains IMPC2.1 (LMGP-22043) and LMGP-17806, strains ATCC334 and IMPC4.1 (with unknown potential probiotic features) and strain LMG23554 (isolated from a blood culture of a patient with infective endocarditis) were included in the study and their ability to modulate the immune response of mouse dendritic cells (DCs) was evaluated. The results indicated that all strains stimulated maturation of DCs but they induced secretion of different cytokine profiles. The highest levels of IL-2 and IL-10 were stimulated by strains ATCC334 and IMPC4.1; the cytokine profile also indicated the latter as a particularly efficient anti-inflammatory strain; probiotic strains IMPC2.1 and LMGP-17806 were characterized by an intermediate ability to induce cytokine secretion. On the contrary, strain LMG23554 showed low ability to induce both IL-10 and IL-12 secretions. This feature could be related to the potential pathogenic behavior of that strain which was also able to translocate to extra-intestinal organs. In conclusion, our data suggest that the cytokine pattern analysis of DCs can be considered as an useful in vitro screening method before embarking on time-consuming clinical studies and, more relevant, to preliminarily define unsafe features of potential probiotic strains.

Biography

Angelo Sisto graduated in Agricultural Science and has a permanent position as a Researcher of the Italian National Research Council in the Institute of Sciences of Food Production. His studies and research interests is focused on microbiology and molecular biology of agri-food relevant bacteria such as plant pathogenic bacteria and bacteria associated to different food matrices. He has been responsible for Research Projects, reviewer for many international scientific journals and of BARD (United States-Israel Binational) Research Projects. He is author of more than 70 publications, many of which are in international journals quoted by ISI.

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