Sadia Zia et al., Int J Biotechnol Recent Adv. 2020
DOI: dx.doi.org/10.18689/2639-4529.a3.004

Effect of Microgravity on *Lactobacillus acidophilus* for Human Immunity Fortification against COVID-19

Sadia Zia* and Ziaur Rahman
University of Central Punjab, Pakistan

Microbial existence and survival requires the ability to sense and respond to environmental changes, including changes in physical forces. This is because microbes inhabit an amazingly diverse range of ecological niches and therefore must constantly adapt to a wide variety of changing environmental conditions, including alterations in temperature, pH, nutrient availability, oxygen levels, and osmotic pressure gradients. Microbes sense their environment through a variety of sensors and receptors which serve to integrate the different signals into the appropriate cellular responses that is optimal for survival. While numerous environmental stimuli have been examined for their effect on microorganisms, effects due to changes in mechanical and/or physical forces are also becoming increasingly apparent. Lactobacilli are probiotics that, among other health-promoting effects, have been ascribed immunostimulating and virus-preventive properties. Certain *Lactobacillus* spp. have been shown to possess strong interleukin-12 (IL-12) -inducing properties.

Spaceflight represents a unique inhabited semi-closed environment, most notably characterized by a decreased gravitational force. Moreover, human presence in space, whether permanent or transient, is accompanied by the presence of microbes. Evaluations of the microbial ecology aboard Mir and the International Space Station suggested a predominance of common members of the environmental flora [4], although the appearance of medically significant organisms has been documented. Whether we are considering the true weightlessness of deep space or the microgravity observed in Low-Earth orbit, it would be reasonable to predict that the microgravity-induced decrease in stress on the surface of microorganisms might affect the gene expression and physiology of both commensal and pathogenic organisms.

L.acidophilus has the ability to induce anti-viral defense gene expression in DC. We analyzed the gene expression profile of TLR-3 and IFN-β, key players involved in viral defense, in murine bone-marrow-derived DCs stimulated *in vitro* with L. *acidophilus* NCFM.

Biography:

Sadia Zia is currently working as Lecturer Biotechnology at University of Central Punjab, Lahore, Pakistan. She is an Executive Member of Asia Pacific Institute of Food Professionals (APIFP) New Zealand. Moderator/Co-Lead of Disease Characterization Group for COVID-19 Pandemic, The Global Health Network, University of Oxford.

Recently completed my Post Graduate Certification in Public Health Policy and Planning from Health Services Academy, Islamabad. I Obtained M. PHIL Degree (Molecular Biology and Biotechnology) from University of Veterinary and Animal Sciences, Lahore. I completed Baccalaureate (Hons) in Biotechnology from Forman Christian College University, Lahore. I was USAID Merit Scholar at FCCU for 4 years. I won the Cultural Exchange Special Nomination from Embassy of China in Pakistan for Modern Teaching Methodologies and Chinese Language from Beijing International Studies University, Beijing, China. I have 8 years (Including 3 years in UCP since, 2017) of Teaching / Administrative experience, 3 years of Research experience as Research Assistant.

My Research Interests are in Molecular Epidemiology of infectious diseases, SNPs, Epigenetics of Human Cancers and emergent infectious diseases and vulnerabilities in populations