

## Possible Effect of Electromagnetic Fields Emitted by Wireless Communication Devices on the Surface Charge of *Lactobacillus*

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With the rapidly increasing application of wireless technologies, the anxiety and speculation about microwave (MW) induced potential health hazards has been attracting more and more attention. Continuous exposure to electromagnetic fields (EMF) can lead to adverse effects on human health such as headaches, chronic fatigue, heart problems, nausea; to affect the central nervous, endocrine and immune systems, and many others. EMF exposure could also affect microorganisms in the human body and change their functions. Bacteria in the human body are more than 1000 species, they mainly live in the large intestine. The gut microbiota is very important for the overall health of the organism. For this reason, interest in the effects of MW on the beneficial bacteria inhabiting our gastrointestinal tract is arising.

There are few studies carried out on the subject in the available literature. The results of our preliminary experiments with a mixture of six species of *Lactobacillus* exposed to 2.41 GHz EMF at three intensities (20, 40 and 180 V/m) for 30 min showed alterations in the growing of lactic acid bacteria and in their ability to form biofilm. Biofilms are social communities of bacteria which are important for survival in their natural environments and protect them from the adverse factors. The surface charge is one of the major determinants of whether a bacterium colonizes a surface to establish a biofilm or not. The initial interactions between the bacterial cell and the surface depend largely on their respective surface properties. Zeta potential (ZP) measurements are appropriate technique for exploring surface processes in bacteria. ZP is a key factor in biofilm formation. There is also data about alterations in zeta potential and electrophoretic mobility of different cells under influence of high frequency EMF. There is no information about effects of EMF on bacterial surface charge. Our hypothesis is that the changes in *Lactobacillus* ability to form biofilm could be a result of alterations in zeta potential after EMF exposure.