

Effects of Glyphosate on Gut Microbiota

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Glyphosate the active ingredient in Roundup herbicide, was developed and patented by Monsanto in the 1970's and now it is the 1 herbicide in use today in the US and increasingly throughout the world. Since glyphosate kills the plants that it is sprayed on this has led to the need to create genetically modified Roundup-ready plants (corn, soy, canola, cotton, alfalfa, wheat, barley and sugar beets) that do not die from glyphosate use. Weeds are then started to gain resistance to Roundup and huge expansion of GMO Roundup Ready crops has led to sharp increases in glyphosate usage over the past decade.

It was declared a major break through in agriculture because glyphosate works by inhibiting the enzyme EPSPS in the shikimate pathway in plants as well as in bacteria, but not in mammals which is necessary to make essential metabolites such as hormones, nutrients, vitamins, essential amino acids. Although glyphosate cannot adversely affect humans via its primary mode of action here we argue otherwise. The human microbiota contains trillions of bacteria that play crucial roles in maintaining our ecology and health and therefore are severely affected by use of glyphosate and its adjuvants.

Although the relationship between the gut microbiota and overall human health is still unclear current researches indicate that disruption of gut microbiota drives leaky gut and a hyper-immune response which leads to chronic inflammation that is the base cause of many diseases such as cardiovascular diseases, metabolic disorders (obesity, diabetes mellitus), neuropsychiatric disorders (schizophrenia, autistic disorders, anxiety and major depressive disorders) as well as gastrointestinal diseases (inflammatory bowel disease, chronic diarrhea, colitis, Crohn's disease). Glyphosate exposure has also been associated with the development of various cancers. Therefore use of probiotics and prebiotic may modify microbial population and have corresponding effects on immunity and neurobiology therefore on health.

Biography:

Ozlem Osmanagaoglu graduated from the Biology Department of Middle East Technical University in Turkey. Later, she completed her master and PhD program on genetics of Lactic Acid Bacteria at the Biotechnology Institute of METU. During her doctoral and post doctoral periods, she had worked under NATO grant and scholarship in the University of Wyoming, USA. Presently, she is a member of the Biology Department within the Science Faculty of Ankara University in Turkey where she has established Microbial Genetics Laboratory with a young productive research team. Her work has focused on bacteriocins, natural antimicrobial peptides, produced by Lactic Acid Bacteria, their molecular typing and probiotics.