2ND INTERNATIONAL CONFERENCE ON CELL SCIENCE AND REGENERATIVE MEDICINE

Gulsen meral

Epigenetic Coaching Company UK

The Importance of Nutrigenetics and Microbiota in Personalized Medicine: From Phenotype to Genotype

Abstract: Precision medicine, also known as 4P medicine (Predictive, Preventive, Personalized, and Participatory), emphasizes integrating phenotypic, genotypic, and environmental factors to develop individualized health strategies. The one-carbon metabolism pathway plays a critical role in cellular methylation, a process that involves the transfer of methyl groups for various biological functions. Genetic polymorphisms within genes encoding enzymes involved in this pathway can significantly impact methylation efficiency, epigenetic regulation, and disease susceptibility. In this context, targeted supplementation is crucial for individuals with genetic variants affecting one-carbon metabolism, including choline, active folate, B12, and B6. Additionally, Vitamin D receptors (VDR) play a dual role in immune modulation and microbiota regulation. VDR variants not only influence the immune response but also have a significant impact on gut microbiota composition, further linking genetics, immunity, and metabolic health.

Translating nutrigenetic and nutrigenomic research into multidisciplinary clinical practice remains one of the most challenging aspects of precision medicine. It is now well established that integrating genotype and phenotype data, along with tailored nutrition, lifestyle, and supplement strategies, enhances clinical success. If we aim to adopt an epigenomic approach, it is essential to base personalized nutrition and supplementation recommendations on nutrigenetics, microbiota composition, and individualized risk analyses derived from genetic and microbiota test results.

Our study aimed to highlight the impact of genetic variants in one-carbon metabolism genes, VDR polymorphisms, and microbiota composition on phenotype. This investigation explored the potential association between genetic polymorphisms within genes encoding enzymes of the one-carbon metabolism pathway and susceptibility to various diseases, emphasizing the intricate interplay between nutrigenetics, microbiota, and epigenetic regulation in personalized health strategies.

Biography: Associate Professor Gülsen Meral graduated from Istanbul University Cerrahpaşa School of Medicine in 1994. She became a specialist in paediatrics in 2001 . She is Associate Professor in Pediatrics and worked as a specialist as well as deputy chief physician and chief physician at several hospitals. She was the Rector's advisor between 2019-2021 at the Northern Cyprus ITU. She is also an Acupuncture instructor. She worked as a Nutrigenetics graduate course and lecturer and gave undergraduate and graduate courses on child development. She has many national and international publications, and worked on editorial boards and as reviewers. She has a Master's Degree in Hospital Management.

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