

The association of gut microbiome with diabetes mellitus type 2

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Diabetes mellitus type 2 (T2DM), a component of metabolic syndrome, represents a growing public health burden across the world and is a leading cause of death. There is a further aggravation in the western industrialized world, thereby taking epidemical characteristics. The emerging and hot theme of gut microbiota, with evidence-based results mainly stemming from animal studies, seems to be applicable on diabetes mellitus regulation; there is a pathogenic association between gut microbiota and diabetes. The total amount of microbial genomes in the gut surpasses the size of the human genome, having around 500-fold more genes that significantly complement our coding potential. Several beneficial effects are attributed to gut microbiota and their genes, such as the breakdown of indigestible dietary fibers to short-chain fatty acids, biosynthesis of amino acids and vitamins and production of neurotransmitters and hormones. It has been postulated, that the selective modification of the gut microflora with the addition of certain probiotics and symbiotics, might ameliorate metabolic dysfunction, thereby preventing the onset of diabetes on high-risk individuals. The cutting-edge and challenging application of gut microbiota in the development of preventive as well as treatment strategies

for T2DM and hyperglycemia in humans are discussed in depth. A plethora of examples for future gut-based glucose-lowering approaches involving microbiota, include, among others, development of probiotic therapies and personalised nutrition, identification of therapeutic components of probiotics, targeted delivery of propionate in the right colon, targeted delivery of metformin in the lower gut, transplantation of faecal microbiota, and the incorporation of genetically modified bacteria which express therapeutic factors into microbiota. All in all, further large randomized clinical trials are mandatory for the further strengthen of the very promising evidence-based results of animal models and their establishment as a standard therapy for T2DM patients with metabolic profile.

Speaker Biography

Michael Doulberis is a Medical Doctor, Veterinarian as well as a PhD holder. He is currently working as Resident of internal medicine and has the aspiration to further focus on gastroenterology. He has a special research interest on investigating the interactions between immune system and gut microbiota and how the latter can influence the character and shape the responses of immune system. Moreover, he has studied how microbial products can beneficially alter the microenvironment of inflammation and inflammation-associated cancer, as proposed by the so-called *hygiene hypothesis model*.

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