

The Immunological Interrelation between Gut and the Metabolic Diseases

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The human microbiome is the collection of bacteria, fungi and viruses that live in and on the human body. The intestinal microbiome is a diverse collection of over 1000 bacterial species that are increasingly recognized as playing critical roles in host functioning in health and disease. Diet has been shown to influence the composition of the intestinal microbiome and associations between the microbial composition and both body mass and type 2 diabetes have been reported. The intestinal microbiome can influence intestinal permeability and thereby play a regulatory role in the development of what is referred to as “metabolic endotoxemia”. Metabolic endotoxemia has the potential to activate innate immune pathways that interface with insulin signaling pathways and can affect glycemic control. Microbial metabolites can act locally at the intestinal mucosa to regulate enteroendocrine cell function, incretin signaling and subsequently glycemic control. The intestinal microbiome can modulate the composition of the bile acid pool and downstream intracellular signaling pathways, including farnesoid X receptor (FXR) and G protein-coupled receptor (TGR5), to influence glycemic control. The intestinal microbiota may also contribute to the risk for type 1 diabetes; as the inappropriate immune education by the microbiota may potentiate autoimmune destruction of pancreatic β cells in genetically susceptible individuals. This presentation will give an overview of microbiome and it will expose the association of the intestinal microbiome to body mass. It will also discuss the effects of alteration of the composition of intestinal microbiome in type 2 diabetes mellitus (T2DM) and the influence of intestinal microbiome on intestinal permeability. The presentation will also explain the metabolic endotoxemia and its relation to obesity, diet and the implication of metabolic endotoxemia in the risk of T2DM. It will also display the effect of modulation of the intestinal microbiome on insulin sensitivity and it will clarify the contribution of the microbiome to T2DM risk via the innate immune pathways, modulation of enteroendocrine cell function and via modulation of the bile acids. The potential role of the intestinal microbiota in type 1 diabetes patients will be also discussed and the future perspectives will be summarized.

Biography:

Prof. Hesham Fouad has completed his bachelor's degree in Medicine and Surgery, postmasters and postdoctoral studies from Alexandria Medical School. He's a Consultant and was a head of Endocrinology, Diabetes and Obesity Department at many top leading Teaching Hospitals and Institutes in Egypt and in the Middle East. He has published loads of scientific researches in reputed medical journals and he's a founder member of many societies. He established a lot of Endocrinology Diabetes and Obesity units and institutes in Egypt and in the Middle East, the most influential one is the Endocrinology and Diabetes Institute in Cairo. He attended as a speaker in plenty of conferences in different Middle Eastern and European countries.