Disease Related Applications

11.35-12.00  The Role of Gut Microbiota in Diabetes Type 1 Development

Diabetes type 1 (T1D) is an autoimmune disease resulting in destruction of insulin producing β-cells in the pancreas which leads to impaired production of insulin and subsequent disease. Genetic predisposition is an important risk factor, but evidence gathered during recent years also suggests that gut microbiota (GM) plays an important role in disease development. High throughput sequencing based studies have demonstrated that the GM differs between individuals diagnosed with T1D and healthy controls. In a range of recent studies, using murine models of T1D, it has been shown that GM manipulation through use of targeted antibiotics or specific dietary components delays or prevents disease development. An overview of our present understanding of the involvement of GM in T1D development and possibilities for preventing or alleviating diabetes through GM manipulation will be presented.

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Holding an MSc (2002) and PhD (2006) within food science (food microbiology). The overall focus of my research is microbial ecology and interactions, with specific focus on: 1) The association between mammalian gastrointestinal microbiota (GM), health and disease and how GM is influenced by diet, pre- and probiotics (in vivo and in vitro based investigations); 2) Indigenous fermented foods in Africa and Europe; 3) Microbial behavior at the single cell level.

12.00-12.25  Use of Inflammation and Microbiome Markers in IBD Clinical Trial Development

Healing of the intestinal mucosa is considered a valid and important metric of improvement in inflammatory bowel disease (IBD). However, a patient must undergo an endoscopy to verify the presence of mucosal ulceration. Regular monitoring using endoscopy is challenging owing to its expensive and intrusive nature. Biomarkers such as C-reactive protein and fecal calprotectin have been proposed as surrogate markers for healing of the intestinal mucosa; however, the sensitivity and specificity of these markers may not be sufficient as routine measures to predict mucosal healing (MH). More accurate non-invasive biomarkers to improve the ability to monitor and predict MH and other efficacy measures are needed. The characterization of gut microbiota from stool samples may provide a profile associated with efficacy outcomes. Reproducible signatures may have the utility to select patients to enter into a trial, serve as efficacy measures during early phase clinical development, be predictive of dose requirements and loss or response. Bacterial signatures may also lead to elucidation of biochemical pathways that could form the basis for new target discovery.

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Roopal Thakkar is a Group Project Director in Clinical Development at AbbVie. He is responsible for the development of Humira in IBD and for other immunology products in Gastroenterology and Rheumatology. Roopal has been with Abbott/AbbVie since 2003.

Notes