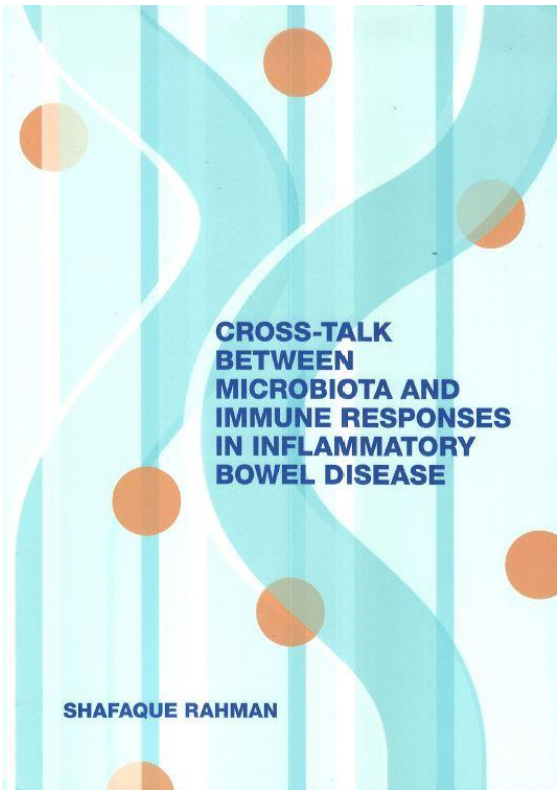

Samenvatting van het proefschrift

S. Rahman
"Cross-talk between microbiota and immune responses in inflammatory bowel disease"

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Promotor:
Prof. dr. W.J. de Jonge

Copromotores:
Dr. S.E.M. Heinsbroek
Dr. T.B.M. Hakvoort

In this dissertation, we explored the interactions between microbes, microbial-derived products, and the immune system in ulcerative colitis (UC) and Crohn's disease (CD). IBD is marked with a high disease burden, and treatment involves not completely effective therapies and/or expensive surgeries. Therefore, understanding the connection between the microbiome and the gastrointestinal immune system will help comprehend the disease pathophysiology and set a foundation to design supportive therapies.

Chapter 2 provides an overview of the various in vitro and ex vivo methods developed to study intestinal physiology and functions. We reviewed the conventional tools such as the different cell lines, organoids etc. to the state-of-the-art gut-on-chip model which closely resembles the physiology of the human intestine and explores the host-microbe interactions in animal-free research methods.

In **chapter 3** of this dissertation, we showed microbial changes after feeding β-glucan (curdlan) in dextran sodium sulphate (DSS)- colitis. We showed that curdlan intake enhances bifidobacteria abundance in the colon and reduces inflammation in an acute DSS colitis model in mice. **Chapter 4**

further addressed the role of mycobiome (fungi), in mild-to-moderate UC patients undergoing fecal microbiota transplantation (FMT) therapy. We identified the genus *Filobasidium* as a potential biomarker and further identified the immunological response of this fungal genus in macrophages from healthy donors.

The next chapters focus on microRNA's and their immunological response in different experimental colitis models. In **chapter 5** we found that miR-511 deficiency alleviates DSS-induced colitis. We showed that miR-511 regulates toll-like receptor (TLR) 3 and 4 responses via Wdfy1 adapter protein. Furthermore, in **chapter 6** of this dissertation, we explored the potential of reducing miR-511 expression through the use of locked nucleic acid (LNA) in a T cell transfer colitis model. This LNA showed some potential in inhibiting miR-511 activity. However, in contrast, miR-511 deficiency aggravated colitis in this model.