

# Studying intestinal immune effects of non-digestible carbohydrates and their fermentation products in an infant setting

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### Introduction

#### In vitro models

Bacteria colonizing the infant mucosa guide the development of a balanced immune-system and also support maturation of the gut-barrier and the immune system. Mother-milk has been considered the golden standard for guiding this colonization. It contains energy sources for microbiota and also supports immune function directly. For those infants where mother-milk is not a feasible option, cowmilk derived formulas supplemented with non-digestible carbohydrates (NDCs) are used. An important function of these NDCs and their fermenation products is a preferred support of Th1-responses responsible for fighting infections. However, we recently found that not all NDCs currently applied, support Th1-responses and that induced responses are dependent on the composition of NDCs. In this project we will study the immune and intestinal effects of various NDC's and their fermentation products.

## **Dendritical and epithelial cell responses**



a. Isolation of monocytes from whole blood

Before centrifugation After centrifugation b. 6 day differentiation protocol to generate immature dendritical cells

Figure 1: Schematic representation of the *in vitro* models to test (A) the direct effects of non-digestible carbohydrates and (B) their fermentation products





#### **Effects of NDCs and fermentation products on epithelial cells**

In vitro Intact NDCs

1.

Transepithelial electrical resistance (TEER)  $\bullet$ 

**Preliminary results intact NDCs** 





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