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## Structure diversity, functionality and modulation of milk oligosaccharides in monogastric livestock species: towards optimal development of rabbit and pig holobionts

As the first prebiotic available to newborns, milk oligosaccharides (MOs) play a crucial role in holobiont assembly. More specifically, they regulate gut microbiota composition and modulate the host's immune response.

A study of the MO composition in humans and some animals reveals an array of structures.

However, the effects of this diversity on holobiont development have yet to be explored. As part of the ANR's HoloOLIGO research project, this thesis project will strive to understand the functional links between MO structure diversity, the metabolic capacities of commensal bacteria in the microbiota and the mucosal immune response of juveniles using a comparative biology approach (pig and rabbit models).

Initially, MO diversity and profile variability will be studied through an exhaustive review of research on mammalian species (systematic literature review). This work will form the basis for building a relational database using data mining (work carried out by MalAGE).

During a second stage, in vitro research will provide a functional understanding of MO structure diversity on the gut microbiota and intestinal mucosal immunity in pigs and rabbits.

Within this context, the ability of commensal bacteria to break down candidate MOs in terms of their structure will be studied. Finally, the direct or indirect action (after metabolization by bacteria) of candidate MOs on the response of immune cells in the intestine will then be studied.

Ultimately, this work will lay the groundwork for using MOs as nutritional supplements in young rabbits and piglets before weaning with a view to building and preserving health.

