

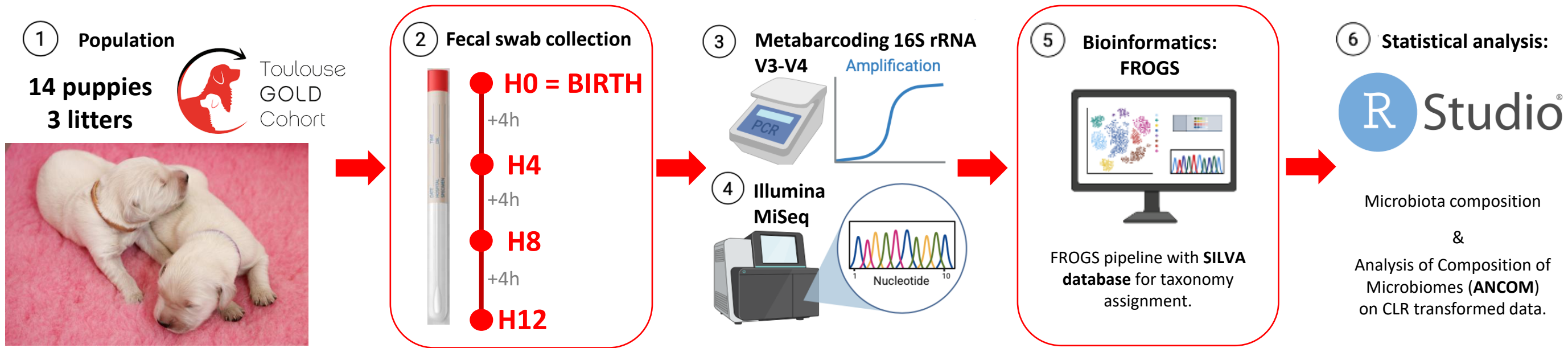
Early dynamics of the gut microbiota in Golden Retriever puppies during the first 12 hours of life: A preliminary study

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- ➔ **CONTEXT** : At birth, the neonatal gut contains oxygen, creating an environment favorable to the initial colonization by aerobic and facultative anaerobic microbes. These bacteria as well as enterocytes consume progressively the oxygen, allowing a progressive shift toward anaerobic conditions and the colonization by facultatif and strict anaerobes^[1]. While this ecological succession is considered to influence long-term health^[2], its early dynamics in puppies but also other species remain poorly described.
- ➔ **AIM** : To characterize the evolution of the gut microbiota in Golden Retriever puppies during the first 12 hours of life.

MATERIALS AND METHODS



RESULTS

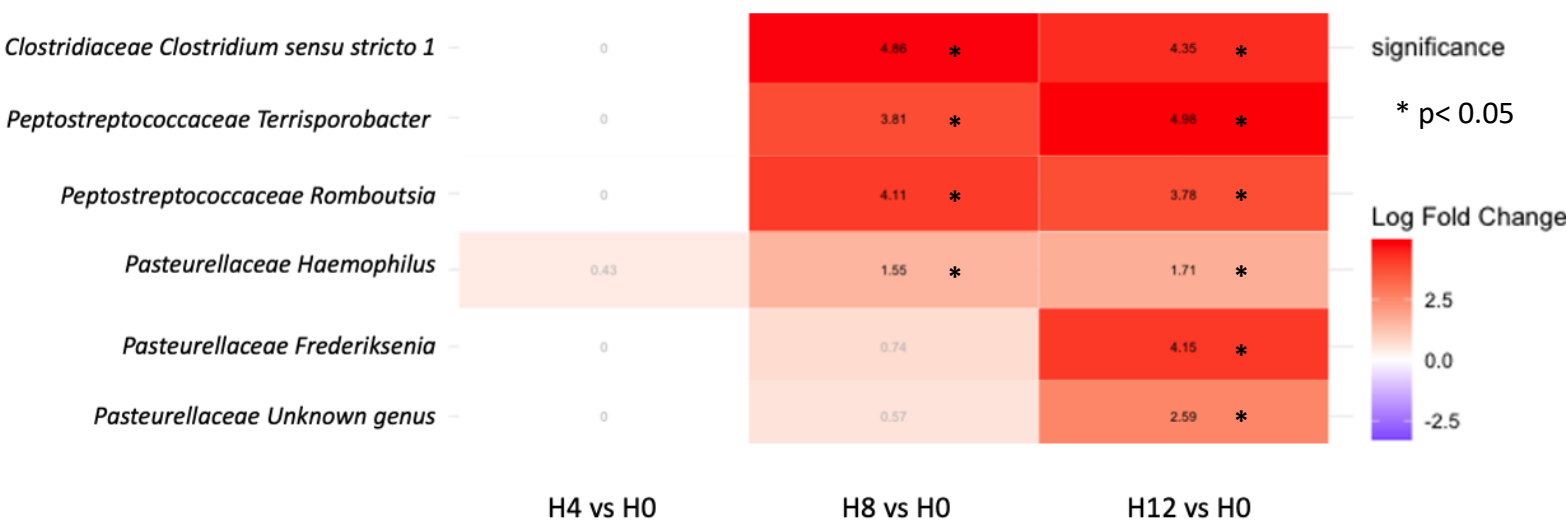
Fig.1. Fecal microbiota composition



Table 1 : Relative abundance of bacterial families showing significant changes during the first 12h of life

Taxa	H0	H4	H8	H12
Clostridiaceae	00±00%	00±00%	20±30%	16±29%
Pasteurellaceae	1±1%	1±3%	5±12%	7±12%
Peptostreptococcaceae	1±2%	2±6%	15±29%	12±25%

Fig.2. Microbial taxa (Genus level) with significant evolution during the first 12h of life



The significant modifications in fecal microbiota were observed for the 1st time at 8H after birth. Six genera significantly increased across time ($p < 0.05$; Fig. 1-2) belonging to 3 families (Table1) : facultative anaerobes from Pasteurellaceae (*Haemophilus*, *Frederiksenia*, *UG1*) and strict anaerobes from Clostridiaceae (*Clostridium sensu stricto 1*) and Peptostreptococcaceae (*Terrisporobacter*, *Romboutsia*).

DISCUSSION & CONCLUSIONS

This study, although conducted on a limited population, confirms a rapid and structured shift in gut microbiota composition during the first 12 postnatal hours. The progressive transition from an oxygen-rich environment at birth to an anaerobic one favors the early colonization by facultative and strict anaerobes, such as *Clostridiaceae*, *Pasteurellaceae* and *Peptostreptococcaceae*. However, the most significant changes were observed only at 8h after birth. Several factors may contribute to the delayed microbial colonization observed at 8 hours post-birth, including oxygen depletion dynamics, timing of first feeding, host gut maturation, microbial growth kinetics, and environmental microbial exposure. These findings highlight thus the need for further investigation, in order to better understand and potentially optimize this critical early-life microbial transition.



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References

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[2] The long-term health effects of neonatal microbial flora. Curr Opin Allergy Clin Immunol 2009. E. Conroy et al.

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