



HAL
open science

Impact of the development of the lung microbiota on neonatal immunity

Aude Remot, Marie-Louise M.-L. Noordine, Chantal C. Bridonneau, Delphyne Descamps, Sabine Riffault, Philippe P. Langella, Muriel Thomas

► **To cite this version:**

Aude Remot, Marie-Louise M.-L. Noordine, Chantal C. Bridonneau, Delphyne Descamps, Sabine Riffault, et al.. Impact of the development of the lung microbiota on neonatal immunity. 20. Colloque du Club des Bactéries Lactiques, Jun 2015, Lille, France. hal-02742693

HAL Id: hal-02742693

<https://hal.inrae.fr/hal-02742693v1>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Impact of the development of the lung microbiota on neonatal immunity

Aude Remot^{1*}, Marie-Louise Noordine¹, Chantal Bridonneau¹, Delphyne Descamps², Sabine Riffault², Philippe Langella¹, and Muriel Thomas¹.

¹ Commensal and Probiotics-Host Interactions Laboratory (UMR1319 Micalis), INRA, Jouy-en-Josas, France.

² Molecular Virology and Immunology (UR0892), INRA, Jouy-en-Josas, France.

* aude.remot@jouy.inra.fr

While the healthy lungs had been thought of as sterile, the concept and the description of a commensal lung flora recently emerged. It has been described a bacterial community in the healthy Human lung, with *Pseudomonas*, *Streptococcus*, *Prevotella*, *Fusobacteria*, and *Veillonella* as dominant members. As it is now admitted for intestinal tract, the pattern of colonization in respiratory tract is expected to influence the health.

The exploration of the impact of the development of the pulmonary microbiota on neonatal immunity is a new and promising area which will impact the management of newborn health. We combined *ex vivo* and *in vivo* strategies to put in evidence how lung bacteria shape the innate and acquired respiratory immunity in mice.

First, we isolated and characterized the primocolonizing bacteria arriving early in the lung of newborn specific pathogen free (SPF) BALB/c mice, using both molecular approaches and *in vitro* cultures. We were able to isolated lung bacteria (mainly facultative anaerobes bacteria, including *Lactobacillus*) as soon as 3 days after birth. Their number was significantly increased after 3 weeks. Then, the effects of the establishment of the microbiota on lung epithelium and immunity were assessed with naive lung explants. Co-culture of explants with lung bacteria revealed differences in the cytokine secretion pattern according to the type of bacteria used. Finally, the influence of the microbiota on the lung protection will be investigated *in vivo* by induction of asthma with House Dust Mite in SPF.

To better understand how the microbial factors influence the immune defenses at early age should improve fundamental knowledge and led to envisage innovative pediatric treatments (like respiratory probiotics) for respiratory diseases.

Keywords: Lung, *Lactobacillus*, Probiotics, Asthma