

The delivery vehicle modulates the immunomodulatory effect of Propionibacterium freudenreichii in healthy piglets

Houem Rabah, Stéphanie Ferret-Bernard, Song Huang, Laurence Le Normand, Fabien Cousin, Floriane Gaucher, Romain Jeantet, Gaëlle Boudry, Gwénaël Jan

▶ **To cite this version:**

Houem Rabah, Stéphanie Ferret-Bernard, Song Huang, Laurence Le Normand, Fabien Cousin, et al.. The delivery vehicle modulates the immunomodulatory effect of Propionibacterium freudenreichii in healthy piglets. The 10 th Cheese Symposium, Apr 2018, Rennes, France. , 2018. hal-01781893

HAL Id: hal-01781893
https://hal.science/hal-01781893

Submitted on 30 Apr 2018

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.

THE DELIVERY VEHICLE MODULATES THE IMMUNOMODULATORY EFFECT OF *PROPIONIBACTERIUM FREUDENREICHII* IN HEALTHY PIGLETS

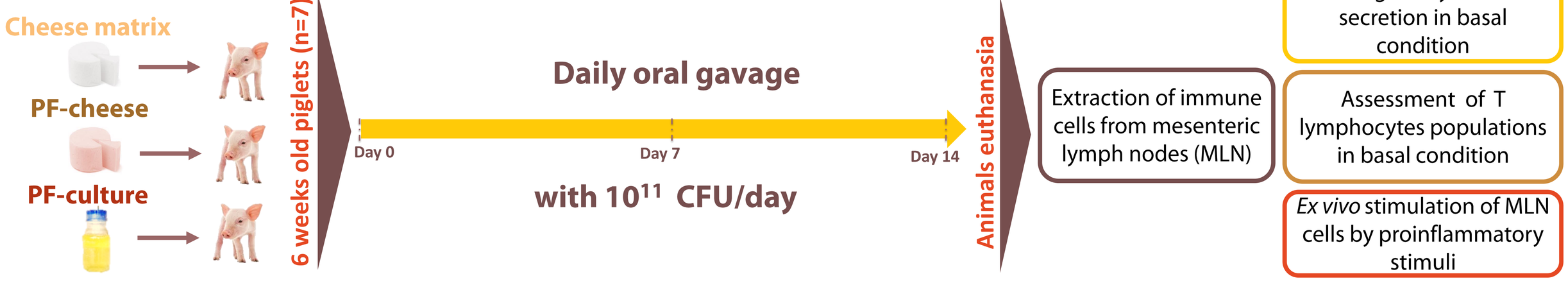
Houem Rabah [1 2], Stéphanie Ferret-Bernard[3], Song Huang[1], Laurence Le Normand[3], Fabien Cousin [4], Floriane Gaucher[1] , Romain Jeantet[1], Gaelle Boudry[3], Gwénaël Jan [1]

1 STLO, INRA, Agrocampus Ouest, 35 000, Rennes, France
2 Pôle Agronomique Ouest, Régions Bretagne et Pays de la Loire, F-35 042 Rennes, France
3 Institut NuMeCan INRA/INSERM/Université Rennes 1 16 Le Clos F-35590 Saint-Gilles, France
4 Aliments Bioprocédés Toxicologie Environnements, Normandie Univ. UNICAEN, UNIROUEN, 14000 Caen, France.

CONTEXT

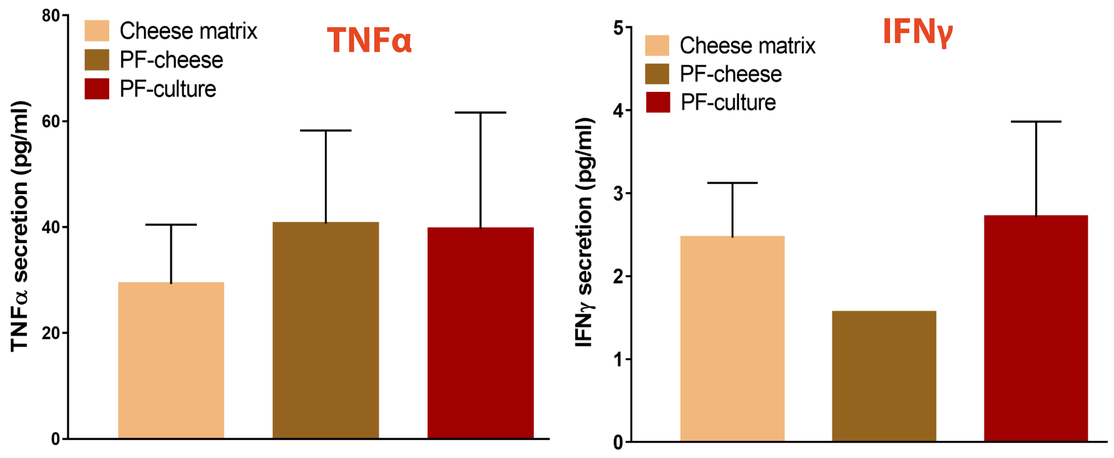
Propionibacterium freudenreichii (**PF**) is a «2-in-1 bacterium»: it is used as a cheese ripening starter and as a probiotic ingredient. Its promising strain-dependent immunomodulatory properties are due to several metabolites including short chain fatty acids, bifidogenic molecules and surface proteins (**Slps**). In this study, we investigated the impact of the delivery vehicle on the immunomodulatory effect of *P. freudenreichii* in healthy piglets. We compared two delivery vehicles, milk utlratfiltrate and a cheese matrix, both fermented by a selected anti-inflammatory strain, *P. freudenreichii* CIRM-BIA129 (ITG P20).

EXPERIMENT DESIGN



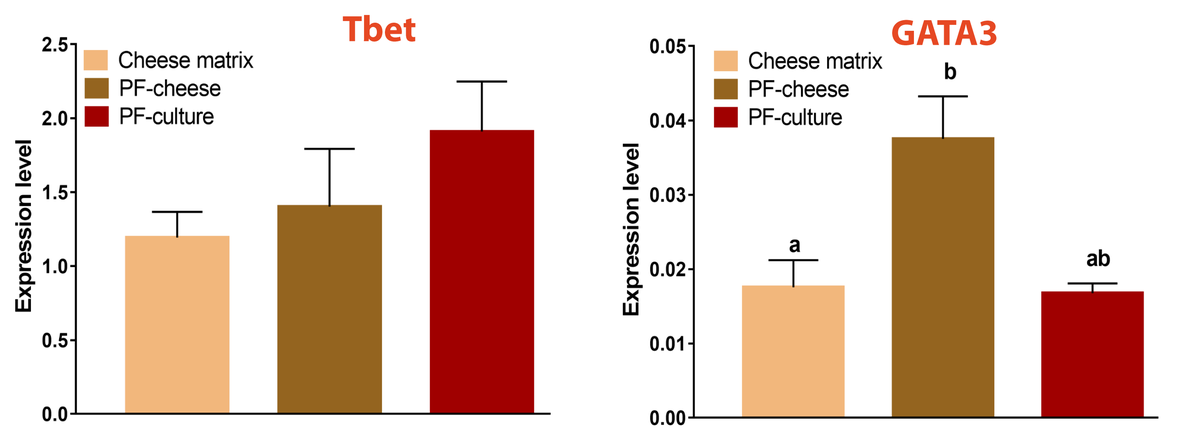
RESULTS

1 PF doesn't modulate the basal secretion of TNFα and IFNγ



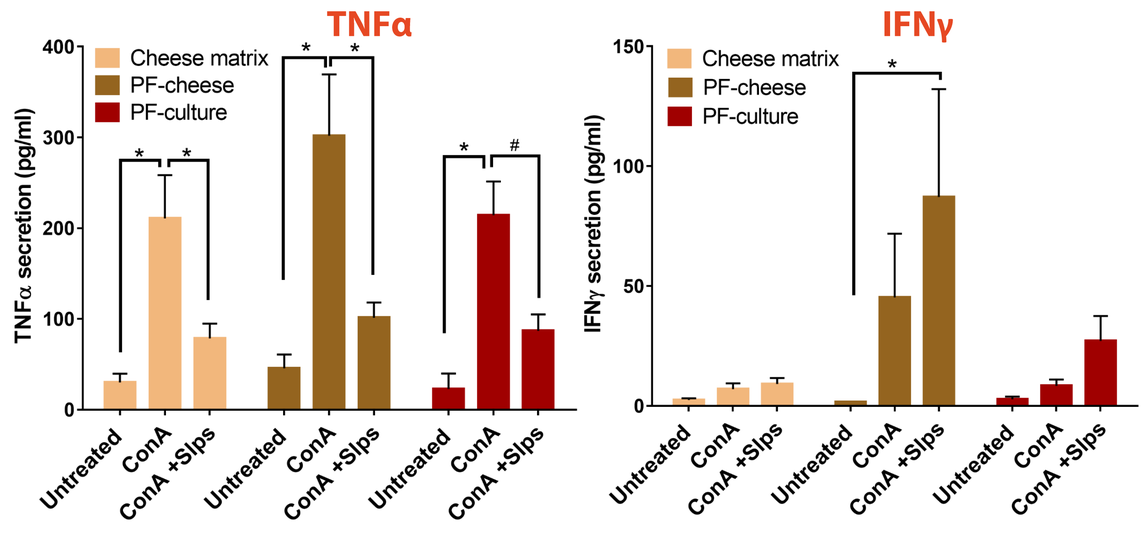
Immunes cells from MLN extracted from the three piglets groups were cultivated during 72h and the basal secretion of TNFα and IFNγ were assessed by ELISA.

2 PF-cheese enhances Th2 response while PF-culture enhances Th1 response



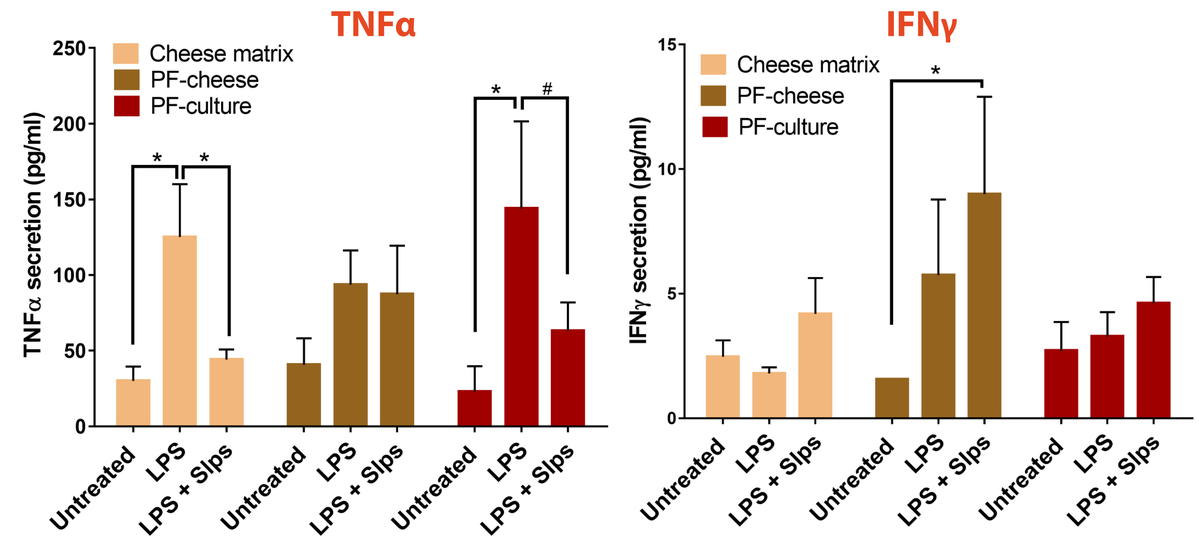
Total mRNA of immunes cells from MLN were extracted. The expression level of Tbet and Gata3 were assessed. Tbet and GATA3 are markers of Th1 and Th2 lymphocytes, respectively. Th1/Th2 orientation was determined by calculating Tbet/GATA3 ratio.

3 PF-cheese enhances IFNγ secretion after ConA and Slps co-stimulation



Immunes cells from MLN of the three piglets groups were cultivated and stimulated during 72h, with concanavalin A (ConA) alone or in the presence of Slps proteins. The secretion of TNFα and IFNγ were determined by ELISA.

4 PF-cheese decreases TNFα secretion and enhances IFNγ secretion after LPS ans Slps co-stimulation



Immunes cells from MLN of the three piglets groups were cultivated and stimulated during 72h, with lipopolysaccharides (LPS) alone or in the presence of Slps proteins. The secretion of TNFα and IFNγ were determined by ELISA.

CONCLUSION

1. The delivery vehicle change Th1/Th2 orientation exerted by PF
2. PF-cheese enhances Th2 response of the gut immunity
3. PF-cheese enhances IFNγ response to proinflammatory stimuli: anti-infection effect in the gut
4. Slps proteins of PF play a role in its anti-infection effect