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3.5 IMPACT OF AGE AND INTESTINAL MICROBIOTA ON THE EXPRESSION OF AVIAN DEFENSINS IN THE CHICKEN GUT

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Defensins of birds belong to the large family of antimicrobial peptides that are key components of mucosal innate immunity. Gene expression of two major avian defensins (AvBD1 and AvBD2) in the chicken intestinal tissue is linked to the host protection against *Salmonella* colonisation. These antimicrobial peptides can be produced by granulocytes and by epithelial cells. They can be purified from chicken bone marrow and are active against a large panel of Gram+ and Gram- bacterial species. While intestinal expression of AvBD1 and AvBD2 can be observed at birth, how it evolves with age remains unclear. In order to assess the influence of the gut microbiota, we compared defensins genes expression profiles in conventional and axenic chicken intestinal tissues during the first two weeks of life. Kinetics of expression of AvBD1 and AvBD2 were different, independently of the microbiological status of the chicken gut. Interestingly, AvBDs expression level appeared lower in the small intestine of axenic chicken by comparison to conventional birds. The presence of a flora seems thus to positively influence the level of expression of AvBDs in the chicken gut. Future work will be devoted to the identification of commensal bacterial species that are beneficial for these antimicrobial peptides expression.

Thursday, 27 September 2012

Session 3

The Gut Microbiome and Immune Development, Health and Disease

Chairs: **Brett Finlay, University of British Columbia, Canada**
John Wallace, Rowett Institute of Nutrition and Health, UK

- 09:00-09:30** **The role of the microbiota in enteric diseases and allergies**
Brett Finlay, University of British Columbia, Canada
- 09:30-10:00** **The ruminal microbiome and animal health**
John Wallace, Rowett Institute of Nutrition and Health, UK
- 10:00-10:30** **The ruminal virome**
Bryan A. White, University of Illinois, Urbana, IL, USA
- 10:30-11:00** **Coffee Break: Session 3 Posters**
- 11:00-11:30** **The chicken intestinal microbiome as a target for improving productivity**
Margie Lee, University of Georgia, Athens, GA, USA
- 11:30-12:00** **Impact of age and intestinal microbiota on the expression of avian defensins in the chicken gut**
Anne-Christine Lalmanach, INRA, UMR 1282 Infectiologie et Santé Publique, Nouzilly, France
- 12:00-12:45** **Session 3 Expert Panel Discussion: Review novel technologies derived from the gut microbiome and discuss what is needed to develop them**
- 12:45-14:00** **Lunch: Session 3 Posters**

Welcome to the International Symposium on Alternatives to Antibiotics: Challenges and Solutions in Animal Production

The symposium will focus on the latest scientific breakthroughs and technologies that provide new options and alternative strategies for preventing and treating diseases of animals. Some of these new technologies have direct applications as medical interventions for human health, but the focus of the symposium is animal production, animal health, and food safety.

The following five areas will be explored in detail through scientific presentations and expert panel discussions:

1. Alternatives to Antibiotics: Lessons from Nature
2. Immune Modulation Approaches to Enhance Disease Resistance and Treat Animal Infections
3. The Gut Microbiome and Immune Development, Health and Disease
4. Alternatives to Antibiotics to Promote Growth in Livestock, Poultry, and Aquaculture Production
5. Regulatory Pathways to Enable the Licensing of Alternatives to Antibiotics

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The World Organisation for Animal Health (OIE)

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