**TRAIN ASAP project**

Bacteriocins from porcine microbiota to prevent Streptococcus suis carriage and infection

There is a growing interest in identifying commensal organisms that produce bacteriocins against veterinary pathogens as this approach could be an alternative to antibiotics for controlling important animal diseases.

  Young pigs (age 4-6 weeks) are susceptible to infection with Streptococcus suis, causing sepsis and meningitis amongst other pathologies, especially in the period directly after weaning. S. suis is a major porcine pathogen with zoonotic potential, and leads to high mortality of piglets post-weaning. If a strategy can be found to prevent infections in this vulnerable period it would curtail the substantial economic losses to the pig industry worldwide due to Streptococcus suis. In this research project a high-throughput screening method is used to isolate, from the porcine oropharyngeal cavity and small intestinal tract, bacteria that produce bacteriocins, proteins produced by bacteria to inhibit the growth of similar or closely related bacterial strain(s), that can kill S. suis. This research is part of a novel approach to prevent colonization and thus infection of young pigs by S. suis. Additionally, high-throughput 16S rRNA pyrosequencing is used to determine the microbial composition and diversity in the porcine oropharynx and small intestine, in order to quantify streptococci, both pathogenic and commensal bacteriocin-producers, within the local microbiota.  
The aim of this project is to find an economically feasible, easy-to-apply approach with the following features:  
-    The selected bacterial isolates are non-pathogenic and endogenous in pigs, and are able to colonize the porcine oropharynx and/ or small intestine that S. suis normally inhabits. In other words: bacteria that can outcompete S. suis;  
-    There will be no need to isolate S. suis specific bacteriocin with costly and time-consuming procedures; the selected bacterial isolates can be administered live and will produce and secrete the active bacteriocin in the environment;  
-    The piglets would only need treatment around the time of weaning (3 – 4 weeks total);  
-    The selected bacterial isolates can for instance be administered as a spray on the piglets'  nose or via the drinking water, after which colonization and protection of the mucosal surfaces will occur.