Host Pathogen interactions – Mastitis

In the EADGENE joint research programme several specific host (e.g. cow, pig)-pathogen relationships get special attention. In the former Newsletters the functional genomics of host pathogen interactions in common, and Salmonella in particular were discussed. In this Newsletter Mastitis will be discussed by Hans-Martin Seyfert (RIBFA).

Why can some pathogens survive in the udder and others not? Persisting infections of the udder (chronic mastitis) is one of the most urgent problems of our dairy animals. It is a problem not only for cows, but also for goats and sheep. These subclinical infections cause more than 80% of all financial losses associated with mastitis (over €1,000M per year in Europe). Moreover, they affect severely the well-being of our dairy animals: How must one feel, having an organ the size of an udder chronically infected?

This is the background of why EADGENE targeted mastitis as one of the four topics for its Joint Research Programme. The mastitis group is searching for techniques of ´Functional Genomics´ to reduce the risk and incidence of mastitis.

EADGENE partners from seven different European countries are working together in the Mastitis Group. An advantage is that results from the different national approaches (different species, circumstances) can be combined. Comparing these results will highlight the mechanisms relevant for clearing the udder from mastitis much better than considering only a single approach.

Crucial for good comparisons of experiments in different laboratories and across different host species, is the application of common “functional genomics” tools. Here again the collaboration within the EADGENE network is helpful: The mastitis working group has chosen to apply a genomics tool, which has been developed by the Roslin Institute and ARK Genomics (Scotland) and is used in all the other involved countries.

The first results of these analyses were presented at the first meeting of the Mastitis Working Group in Lelystad (NL) on the 2nd-3rd February 2006. Comparison of the data between udder infections show that one kind of pathogens *(E. coli*) regulates many more genes in the udder than another kind of pathogen *(S. aureus)*. These, however, cause a different kind of infection (subclinical, chronic) rather than the heavy, acute infection caused by the *E. coli* pathogens. The first data from the infections conducted in cows with three pathogens (*E. coli*, *S. aureus* and *S. uberis*) have now been handed over to the bioinformaticians to investigate further the important genes.