

## **Host pathogen interactions: *E. coli***

*Escherichia coli* (*E. coli*) are one of the most common bacteria in the large intestine of warm-blooded animals. Although, in general *E. coli* are 'good' bacteria, with a positive and necessary function in the large intestine, some strains can cause a wide range of diseases, ranging from diarrhoea to extra intestinal infections such as septicaemia and urinary tract infection. Among them, Enterohaemorrhagic *E. coli* (EHEC) are zoonotic (can be transmitted to humans from animals) intestinal pathogens of global importance. EHEC are firmly associated with severe human illnesses like bloody diarrhoea and haemolytic uraemic syndrome, causing life threatening renal and neurological sequelae (pathological condition resulting from a prior disease). EHEC rarely cause disease in animals, and ruminants are recognised as their main natural reservoir. Poorly cooked ground beef and unpasteurised milk have been the most frequent causes of infection, but also direct contact with ruminant faeces is a major risk of infection.

The *E. coli* working group tries to define the combination of virulence genes and the mechanisms that make an EHEC strain fully pathogenic. This will be essential to improve the efficacy of diagnostic tests for surveillance of animal reservoirs, the assessment of public health risks and for the development of novel vaccines or treatment for control of EHEC infections. Different strategies will be used for this research. Resources and expertise will be used to define genes contributing to virulence by hijacking the host cell signalling systems and/or genes that intermediate the colonisation of the intestines.

The working group will focus on the "type III secretion system", a sophisticated machinery (a kind of molecular syringe) used by the bacteria to inject proteins into the host cells. These proteins can then subvert, inhibit, or activate cellular processes to benefit the *E. coli* bacterium: Furthermore, the emphasis of the group is placed upon the identification of new virulent determinants which could lead to the development of novel diagnostic methods and preventive strategies that would help monitor the flow of *E. coli* virulent genes in the food, animal reservoirs and the natural environment. Groups in several institutes (and laboratories) are working together, exchanging experimental data and resources.

The *E. coli*'s working group contribution to EADGENE's pathway to healthier animals and safer food!