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Session An IV

Application of Biotechnology to Improving Animal and Human Health- Part II
Coordinators

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Presentation by Dr JC Hodgson, invited speaker, Principal Scientist, Bacteriology Division, Moredun Research Institute, UK

1. Title & Abstract:

Towards the development of novel vaccines against diseases of bovids caused by *Pasteurella multocida*

Pasteurella multocida is an important veterinary pathogen with a diverse and complex structure, host range and virulence that causes pneumonic and systemic disease in bovids, fowl cholera in chickens and turkeys, atrophic rhinitis in pigs, and snuffles in rabbits. Losses to beef and dairy industries caused by bovine pneumonic pasteurellosis are over one billion dollars per annum in the USA and over £30 million in the UK. The disease haemorrhagic septicaemia, a form of endotoxin shock caused by *P. multocida* serotypes B and E, is of great socio-economic importance across South Asia and sub-Saharan Africa affecting all principal livestock species including cattle, water buffalo and camels, in which morbidity and mortality rates are high. Resultant losses of meat, milk and draught animals have devastating effects on the health and wealth of local communities where annual costs of several million US dollars are probable underestimates due to a lack of comprehensive surveillance data.

Morbidity, mortality and economic losses continue, and a better understanding of the genetic basis for virulence of *P. multocida* and its mechanisms of pathogenicity is required in order to develop improved vaccines. This presentation will discuss novel experimental approaches including the production of bacterial mutants and the use of functional genomics and proteomics to identify key bacterial components for testing as vaccine candidates, the development of relevant disease models in large (target) and laboratory animals, and the possible role of biofilms in carriage and initiation of disease

2. Short profile

I am a project leader of long-standing at the Moredun, studying the host response to infectious bacterial disease and identifying the key role of endotoxin in causing a range of diseases, including systemic pasteurellosis and watery mouth disease in lambs and haemorrhagic septicaemia in buffalo calves. I lead currently the *Pasteurella* Research Group, with a major research focus on the mechanisms and epidemiology of disease during pneumonic and systemic pasteurellosis in cattle caused by *Pasteurella multocida*, using functional genomics and proteomics to identify and characterise novel surface components of pathogenic and commensal isolates of *P. multocida* and working with

academic and commercial partners nationally and internationally to develop novel diagnostic and control products.