The good, the bad and the 'green' -- harnessing the potential of bacteria

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(PhysOrg.com) -- A diverse family of bacteria that can cause a potentially fatal illness in humans but could offer a greener alternative to petrol to power our cars will be the subject of a talk by a University of Nottingham academic at an international conference.

Professor Nigel Minton, one of the world's leading experts on the Clostridium bacteria, will be presenting at the Society for Applied Microbiology (SfAM) annual Winter Meeting, being held at the Royal Society in London on January 12.

In his presentation Professor Minton will discuss the potential exploitation of the anaerobic, Gram-positive Clostridium bacteria — a few strains of which have given the genus a bad name.

Clostridium difficile infection is the most significant cause of hospital-acquired diarrhoea and is seven times more deadly than MRSA. The bacterium is present in the gut of up to three per cent of healthy adults

and 66 per cent of infants. Usually it is kept in check by the healthy balance of bacteria in the gut but when this is disturbed by certain antibiotics, C.difficile can multiply rapidly and produce toxins that cause illness and death. The disease is spread through spores, usually from poor hygiene. The emergence of highly virulent clones means that cases and fatalities from the illness are on the increase.

In addition, there has been heightened public concern in recent years about the potential use by bioterrorists of the food-borne pathogen Clostridium botulinum, which causes the rare but serious paralytic illness botulism.

However, Professor Minton will argue, there is an urgent need to understand the basic biology of these important bacteria to enable scientists to both prevent and treat the diseases they cause and to harness the potentially beneficial properties which they also offer.

In particular, high oil prices and the need to move towards a more sustainable energy economy has sparked an increased interest in the use of clostridial fermentations for biofuel production. Strains of Clostridium can offer a highly effective method of producing renewable ethanol and butanol.

Latest research which has demonstrated that some Clostridia spores have a unique ability to selectively germinate in tumours indicates that the bacteria could even potentially play a part in treating cancer.

The meeting organised by SfAM, the UK's oldest microbiology society, will bring together more than 100 international scientists to learn about two of the hottest topics in microbiology — probiotics and anaerobic microbes.

Provided by University of Nottingham