



The potential for genetically modified Salmonella use in cancer therapy

Scientists at Arizona State University have investigated the use of genetically modified Salmonella to kill cancer cells. It has been recognised that Salmonella can colonise solid tumours and have an intrinsic ant-tumour effect. There are obvious risks involved in administering Salmonella to compromised individuals, however by modifying the lipopolysaccharide outer membrane of the bacteria the researchers have made the organism less toxic. The team tested various modified Salmonella strains to see how they reacted in test tube studies with human cancer cells and in tumour bearing mice. They have successfully identified a mutant strain which is effective at killing cancer cells and shrinking tumours but which is unable to cause disease.

An additional genetic modification; an inducible arabinose promoter, allows the Salmonella to colonise tumours and turn toxic once it enters the cancerous cells, therefore not affecting the normal healthy cells. In a normal cell, the Salmonella divide relatively slowly (once or twice in a 24 hour period), but in a tumour cell, they divide every hour.

The University Professor of Microbiology, Roy Curtiss stated that the study goes a significant way in developing strategies for the use of Salmonella as part of a cancer therapy.

1,000 year old remedy effective against MRSA

A remedy found in an old English manuscript held in the British library (called Bald's Leechbook containing garlic, onions or leeks, wine and cow bile) has proved to be effective against bacteria resistant to modern day antibiotics. Scientists at the University of Nottingham have recreated the remedy (known as an "eye salve") and tested it on cultures of MRSA, with the salve being effective in up to 90% of cases.

The findings of the team from Nottingham University will be presented at the Annual Conference of the Society of General Microbiology in Birmingham.

Garlic contains Allicin, an organosulphur compound. When fresh garlic is chopped or crushed, the enzyme alliinase converts alliin into allicin, which is responsible for the aroma of fresh garlic. The allicin generated is very unstable and quickly changes into a series of other sulphur containing compounds such as diallyl disulphide. It is this compound which exhibits the antibacterial activity.

We incorporate bile salts into our laboratory media as a selective agent as they are very effective in inhibiting the growth of many bacteria. Organisms which are tolerant to bile salts tend to be the gut bacteria, and Salmonella (which can tolerate very high levels of bile salts) utilises this trait when it adopts the asymptomatic carrier status as it is able to migrate up the bile duct from the intestine and colonise the gall bladder.

More advances in culture free detection methods

I think it is reasonable to assume that advances in DNA technology and whole gene sequencing techniques will inevitably put pressure on the conventional cultural microbiological techniques.

Toshiba and the Kawasaki City Institute for Public Health have utilised a DNA chip technology which they claim can test simultaneously for 14 foodborne pathogens in less than 90 minutes.

They have developed an electrochemical DNA chip card which they claim overcomes the complicated procedures involved with genetic testing by conventional methods.

Because of its ease of use, the technology is being aimed directly at food manufacturers.

Investigation into Legionella outbreak fails to identify the source

An investigation by the Health and Safety Executive and Lothian and Borders Police into the circumstances surrounding an outbreak of Legionnaires disease which killed 4 people in July 2012 has been unable to identify the source of the Legionella bacteria. As a result Crown Counsel has concluded that there is insufficient evidence to prosecute any person or organisation for the deaths.

Foodborne Norovirus survey and other viruses in the food chain

We are constantly advised of the dangers of contracting Norovirus when many people confined in a small environment; last week the CDC announced that yet another cruise ship reported the disease, with 95 passengers and 5 crew members falling ill with vomiting and diarrhoea. However, a recent study coordinated by the National Institute for Public Health and the Environment in the Netherlands concluded that 14% of Norovirus outbreaks originate from contaminated food.

Tracing the epidemiology of foodborne viral infections can be complex as following the primary introduction

of the virus through food; secondary person to person and environmental transmission can make it hard to trace the disease back to the original contaminated product.

The European Food Safety Authority has stated that outbreaks associated with Norovirus in frozen Raspberries and Strawberries are an emerging public health risk.

The Advisory Committee on the Microbiological Safety of Food has recently published an update on viruses in the food chain. This can be accessed on <http://www.food.gov.uk/sites/default/files/acmsf-virus-report.pdf>

In addition, another study published in the Journal of Clinical Microbiology states that human Norovirus strains may affect dogs, raising the possibility of dog-human zoonotic transmission.

Advice on visits to petting farms....again!!

Talking of zoonotic infections, the Health and Safety Executive for Northern Ireland (HSENI) is reminding parents and teachers of the importance of schoolchildren washing their hands after being in contact with animals.

Educational events encouraging human-animal interaction include the risk of zoonotic disease transmission. It is estimated that 14% of all diseases in the USA caused by Campylobacter, STEC E coli, Salmonella, Listeria and Yersinia were attributable to animal contact.

World Health Day

April 7th was World Health Day, promoted by the World Health Organisation, which this year focused on food safety; highlighting the challenges and opportunities under the slogan, "from farm to plate-make food safe."

The WHO stated that the food chain is now longer and more complex than ever before, and demographic, cultural, economic and environmental developments are increasing foodborne health risks.