

ASMR ACT New Investigator Forum 2014

Tuesday June 3 2014

ACT'S YOUNG INVESTIGATORS MEET AT THE JOHN CURTIN SCHOOL OF MEDICAL RESEARCH

Pickin' the chicken that sickens

The intensive use of antibiotics has led to the evolution of bacteria that are resistant to antibiotics. There is increasing concern of such antibiotic-resistant bacteria, including some strains of *E. coli*, being transmitted to humans via the food supply. To determine whether such concerns as warranted, Belinda Vangchhia and David Gordon from the Australian National University looked for antibiotic-resistant *E. coli* in poultry meat purchased from Canberra supermarkets and butcheries. Strikingly, over 60% of *E. coli* isolated from the meat samples were found to be resistant to at least one antibiotic, suggesting that the food we consume is a significant source of antibiotic-resistant *E. coli*. "Alarmingly, the team identified a few *E. coli* isolates that were resistant to a class of antibiotic banned in Australia for use in animals for more than 20 years". The results suggest that some post-processing contamination of poultry products may be occurring in Australia.

Simple cancer vaccine on the horizon?

There is growing evidence that stimulating the body's own immune system (immunotherapy) could be one effective tool in the fight against cancer. Christina Salmon and colleagues at the Australian National University and University of Queensland have been studying the effectiveness of delivering a dose of immunotherapy into a solid tumour. In mice, they have found that injecting tumours with a simple immunotherapy preparation results in increased survival. Furthermore, they have recently commenced trialling this treatment in dogs with tumours, observing complete remission of terminal cancers in two dogs. If these promising results are replicated in more animals, we may not be far away from a simple and inexpensive cancer vaccine.

Starving cancer cells to overcome drug resistance

The primary hurdle for effective chemotherapy is the resistance of some cancer cells to drugs. One pathway involved in drug resistance appears to be glucose metabolism, with recent studies linking changes in cancer cell metabolism to multi-drug resistance. At the Australian National University, Santhi Achuthan and Anneke Blackburn have shown that targeting glucose metabolism may be an effective strategy for overcoming drug resistance in breast cancer. Using a non-toxic compound called dichloroacetic acid (DCA), which alters glucose metabolism in cancer cells, they found that drug-resistant cells could be re-sensitised to the original chemotherapy. Using dichloroacetic acid in conjunction with established chemotherapies may help overcome drug resistance in cancer cells.

Interview and Photo Opportunities (Awards presented 4:40pm to 5pm)

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