

Professor Colin Cooper: Presentation to the Bournemouth Masonic Welfare Association AGM

Professor Cooper is honoured to be The Grand Charity Chair of Molecular Biology at the University of East Anglia. Professor Cooper explained that he had started research on prostate cancer about 14 years ago. At that time there was only one team in the UK dedicated to research on this disease: Professor Maitland's group at the University of York. He contacted major charities and found that on average only 5p per adult man was spent on basic research on prostate cancer. Because of this prostate cancer research had been sadly neglected in the UK. The government and major charities joined forces to inject funding into prostate cancer research. There was a UK competition and Professor Cooper won one of two major awards to set up prostate cancer research in the UK.

Because of the lack of funding, first very little is known about what causes prostate cancer. We know that the incidence of prostate cancer varies widely between different countries: Prostate Cancer is very rare in China and Japan, and around 10 fold more common in Europe and the USA. If Japanese men migrate to the USA after two generations and a change in diet to a USA diet their prostate cancer incidence increases. It is clearly something in the diet but we don't know what it is with a few exceptions. First there is good evidence that lycopene (the red stuff in tomatoes) can protect against prostate cancer: there is a lot more lycopene in tomato ketchup than in fresh tomatoes. Secondly, consumption of milk protein appears to cause prostate cancer. Professor Cooper had recently moved to the University of East Anglia on the Norwich Research Park (NRP). The reason for this is that the NRP is the location of the The John Innes Centre (JIC) and The Institute for Food Research (IFR). These centres have active research programs that are highly relevant to understanding what caused cancer in the diet. Professor Cooper joined forces with Professor Richard Mithen to enter a world-wide competition for research on prostate cancer, held by the Prostate Cancer Foundation of USA. They jointly won an award to carry out research focused on the use of Beneforte Broccoli in the prevention of prostate cancer. Two servings a week is sufficient to help cancer prevention.

Very little was known about how prostate cancer develops: about the underlying molecular mechanism of development of this disease. This is one area that has changed. We now know a great deal about how this disease develops. Professor Cooper gave a molecular biology lesson explaining how that the human genome or DNA present in every cell in the body contains around 30,000 genes. Five or six of these go wrong in a cancer cell, but for each individual cancer the genes are different. Professor Cooper explained how the cost for decoding the cancer genome was originally \$2 billion. Now with remarkable new technologies this information can be decoded for around \$3000. Professor Cooper won a Cancer Research UK competition to collect this information from 250 prostate cancers. As

part of this project he will be comparing prostate cancers from Shanghai and the UK to see if any differences can be observed. This is one area that has changed dramatically since Professor Cooper last spoke at the Warwickshire Installed Masters Lodge.

At Norwich Professor Cooper is trying to translate information from this project into patient benefit. For the cost of \$200 it is possible to look at the 500 most important cancer genes. Professor Cooper is setting up a project to screen every cancer diagnosed at the Norfolk and Norwich University Hospital: that is 5000 cases a year. This information is important because the presence of a particular mutation can tell the doctor what drug should be used with that patient. Normal therapy for advanced prostate involves androgen withdrawal. However if, for example, you had a prostate cancer with an alteration in the BRCA1 or BRCA2 genes (present in only 2 men in 100) your treatment would be completely different and you could be cured. I

Professor Cooper reminded the audience that when he had spoken last time a key problem that he was concerned with was that most of the prostate cancer that is diagnosed is harmless, this is unlike any other cancer. Around 50% of men over 60 will have cancer in their prostate if the prostate were examined down a microscope but only 10% of these cases would ever become clinically important. However at the time of diagnosis it is not possible to distinguish the aggressive cancers from the non-aggressive cancers. A critical aim of Professor Cooper's current research was therefore to discover new markers (called biomarkers) that could distinguish aggressive from non-aggressive disease: to distinguish the tigers from the pussycats.

Professor Cooper also explained that cancer treatment had advanced considerably in recent years. There was a drug now called abiraterone that could completely remove androgens from the body and that was much more effective against prostate cancer. Immunotherapy for this disease had also improved considerably. Thus overall the chances of surviving from prostate cancer now were considerably greater than they were 7 years ago. This is impart due the generous support given to Professor Cooper by the Grand Charity. Professor Cooper thanked the audience for their support.