RESEARCH

Drug resistant TB studied to develop new drugs

Through the study of drug sensitive and drug resistant TB strains, scientists hope to identify markers for the design of rapid TB tests, develop new drugs and to assist the TB program to control drug resistant TB.

When it comes to TB research, the CBTBR enjoys competitive advantage in many areas, mainly as a result of funding, expertise in the field and valuable resources – such as a unique bank of samples, collected over many years by Profs Tommie Victor and Rob Warren of the CBTBR SU node.

This bank represents one of the largest collections of TB samples in the world, including more than 13 000 drug sensitive and 6 000 drug resistant cultures which form a vital resource for studies that use DNA fingerprinting to track the evolution of drug resistant strains and how they spread through populations.

Working with these strains, the CBTBR team are trying to find out how tuberculosis strains mutate to become resistant to antibiotics. By whole genome sequencing and comparing the DNA of numerous strains, they identify gene variations that seem to correlate with drug resistance. So far the team, in collaboration with partners at the Harvard School of Public Health in the United States, have identified more than 40 mutations that can either confer or enhance drug resistance in TB bacteria. They hope to sequence thousands of TB bacteria to derive the most comprehensive view of drug resistance possible.

Recently, Prof. Victor received a grant amounting to R4 million over a period of three years from the Wellcome Trust to study drug resistant TB.

His team plan to use a range of state of art complementary strategies to identify molecular events which allow the bacterium to become hyper-resistant. These events may change the characteristics of the bacterium by altering metabolic processes which regulate the intracellular drug concentration. These events can be targeted (in combination with existing anti-TB drugs) to restore the level of drug resistance, Prof. Victor says.

In photo (right to left): Prof Tommy Victor, Dr Gail Louw and Prof. Rob Warren.