UFS researcher one step closer to treating HIV/Aids

In 2015, an estimated seven-million South Africans were living with HIV. In the same year, there were 380,000 new infections while 180,000 South Africans died from Aids-related illnesses...

Nthabiseng Mokoena. Photo: Leonie Bolleurs

Invasive fungal infection, common in certain groups of patients with immune deficits, is a serious driver of global mortality in the context of the global HIV pandemic. “Despite a major scientific effort to find new cures and vaccines for HIV, hundreds of thousands of HIV-infected individuals continue to die on a yearly basis from secondary fungal infection. Intensive research needs to be done to help reduce the unacceptably high mortality rate due to the infection in South Africa,” said Nthabiseng Mokoena, a master’s student of Professor Carlien Pohl-Albertyn, who is heading the Research Chair in Pathogenic Yeasts in the Department of Microbial, Biochemical and Food Biotechnology at the University of the Free State (UFS).

She received her master’s degree at the December 2018 graduations of the UFS. Her thesis is titled: <>Caenorhabditis elegans as a model for Candida albicans-Pseudomonas aeruginosa co-infection and infection induced prostaglandin production.

Research Chair in Pathogenic Yeasts

Earlier this year, the National Research Foundation approved the Research Chair in Pathogenic Yeasts. One of the projects of the group of scientists in this chair include a study of the interaction between the yeast, *Candida albicans* and the bacterium, *Pseudomonas aeruginosa* in different hosts, using a variety of infection models.

In her research, Mokoena studied the response of infectious pathogens such as yeasts and bacteria, using a nematode (little roundworm) as an infection model to mimic the host environment. Nematodes have a number of traits similar to humans. It is thus a good alternative for humans as infection models, as it is unethical to use the latter.

Nematodes have a number of advantages, including its low cost and fast reproduction and growth.

Mokoena monitored the survival of the nematodes to see how infectious the pathogens are, especially in combination with each other.

Role of infection model for drug development

When these two pathogens were studied in a lab (in vitro), it was found that they can inhibit each other, but after studying them in the infection model (in vivo), Mokoena showed that these pathogens are more destructive together.

This finding has a huge impact for the pharmaceutical industry, as it can provide information on how drugs need to be designed in order to fight infectious diseases where multiple organisms cause co-infections.

Many pathogens are resistant to drugs. Through this model, drugs can be tested in a space similar to the human body. Seeing how pathogens react to drugs within a space similar to the human body, can contribute to drug development.

Not only are drugs developed more effectively through this model, it is also less expensive.

It is the first time that the combination of the yeast, *Candida albicans* and the bacterium, *Pseudomonas aeruginosa*, is being experimented on in this model.