

## **Report on research visit of Prof. Kailash C. Patidar**

**[University of Missouri - University of the Western Cape -- Academic Exchange Program for 2017]**

This report is based on the questionnaire contained in the UM-UWC exchange application form 2017. As part of this exchange program, I visited the University of Missouri at Kansas-City during 01-30 June. The report answers the following questions:

**i. What were the objectives of your visit?**

The main objective of this visit was to start collaborative work with experts from UM towards mathematical studies on disease modeling for TB-HIV co-infections affecting South Africa. In particular, we aimed to deal with the three integral part of disease modeling: (i) Modeling, (ii) Analysis and (iii) Simulations. In view of these, we (my host, Dr Naveen K Vaidya and I) intended to (i) Develop spatial-temporal model(s) of reaction-diffusion type to model the dynamics of TB-HIV co-infections in South Africa, and (ii) Do the theoretical and numerical analysis of the model(s) developed in the first step above.

**ii. If your objectives were fulfilled, to what do you attribute your success? If not, what were the reasons?**

As we anticipated for the first phase of this work, we could find the framework in which to consider the spatio-temporal models for disease modeling. The main success was to have the robust numerical method ready to handle complex systems of these modeling equations.

**iii. If you could change any aspect of your visit, what would it have been?**

In future, I would anticipate more interaction regarding projects involving graduate students from both

mostly on analysis and simulation aspects of the governing model, this particular visit indeed helped me in understanding how models get modified with change in realistic scenarios. Several day-to-day discussions with my host were extremely helpful during this visit. Those in-depth discussions may help me in considering key parameters that I will be using for most of the mathematical problems that my research team would be solving in future.

ix. **Given the opportunity to participate in the exchange again, would you do so?**

Yes, definitely.

x. **What, if anything, about your exchange experience was most helpful?**