

Electro-Active Photonic Devices for Novel Spectroelectrochemical Biosensors

This project will create a partnership between the University of Louisville (U of L) in the United States and the Federal Universities of Rio Grande do Sul (UFRGS) and Paraná (UFPR) in Brazil to allow exchanges of crucial scientific knowledge on recently introduced breakthroughs in the field of biophotonics and to explore their applications. We envision that the proposed joint collaboration will enable the Brazilian partners to gain the expertise to design, fabricate, characterize, apply, and further develop electro-active, single-mode, integrated optical waveguide technology, which have been recently pioneered by the U of L partner as a very attractive photonic platform for biomolecular detection using advanced spectroelectrochemical techniques. The newly introduced photonic technology has the potential to be chemically and biologically functionalized - by incorporating technologies presently under use and investigation by a synergic group of biologists, physicists, and chemists - for development of highly specific and sensitive biosensors in unique and pressing public health needs existent in Brazil. A major goal of the project is to transfer to Brazil a novel technology that is currently being developed and pioneered by Prof. Mendes at the University of Louisville. This innovative photonic technology, at which Prof. Mendes is one of the world leaders, has great potential for novel biosensing approaches that could detect pathogens within the window period due to its ability to directly probe the pathogen proteins thus bypassing approaches that rely on detection of antibodies developed by the immune system as a response to an infection.

