

# Seminar Talk

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**Professor**

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**Tuesday, October 24, 2017**

**3:00 p.m. KH 224**

**Title:** Plasma Medicine: A Progress Report

**Abstract:**

Plasma medicine is a growing interdisciplinary field where low temperature plasma (LTP) is used as a technological basis to develop innovative medical therapies. Recent research has shown that LTP enhances blood coagulation, kills antibiotic resistant bacteria, and can even kill cancer cells without harming healthy tissues. The physical and biochemical mechanisms of action of low temperature plasma are still not well understood. But in the last decade a large body of knowledge has been generated by a sizable global research community. Briefly, it appears that most of the observed biological effects are mediated by the reactive oxygen species (ROS) and reactive nitrogen species (RNS) generated by the plasma. ROS and RNS can oxidize cellular lipids and proteins and can also trigger cell signaling pathways that lead to apoptosis. In this talk, some of the history of the field will be summarized. This will be followed by an overview of plasma devices used in plasma medicine research and a discussion on the effects of LTP on select healthy and cancerous cell lines.

**Bio:**

Dr. Mounir Laroussi received his Ph.D. in Electrical Engineering from the University of Tennessee, Knoxville. He now holds a Professor position at the Electrical & Computer Engineering Department of Old Dominion University (ODU) and is the Director of ODU's Plasma Engineering & Medicine Institute (PEMI).

Dr. Laroussi's research interests are in the physics and applications of non-equilibrium gaseous discharges including the biomedical applications of low temperature plasma (LTP). He designed and developed numerous novel LTP devices such as the resistive barrier discharge (RBD) and the plasma pencil. He is co-discoverer of guided ionization waves in low temperature plasma jets. Dr. Laroussi is also widely known for conducting the first pioneering experiments on the use of low temperature atmospheric pressure plasmas for biomedical applications and for highly contributing to the establishment of the interdisciplinary field of "Plasma Medicine". For his scientific achievements in the field of low temperature plasmas and their biomedical applications he was elevated to the grade of Fellow by IEEE in 2009, was the recipient of the Inaugural Award from the International Society for Plasma Medicine, and in 2012 was awarded the highest technical achievement award from the IEEE-NPSS, the Merit Award.