



cordially invites you to an

Interdisciplinary Seminar

with

Dr. Nourridine Siewe

on

“Granuloma formation in leishmaniasis: A mathematical model”

Tuesday, September 6, 2016

3:30-5 p.m.

Reception & refreshments at 3 p.m.

Hallam Auditorium, Room 206

1122 Volunteer Boulevard



Nourridine Siewe (Mathematics, Howard Univ.) is developing mathematical models of visceral leishmaniasis and malaria co-infection to improve the diagnosis and treatment process.

Abstract: Leishmaniasis is a disease caused by protozoan parasites of the genus *Leishmania*. The two common forms of leishmaniasis are cutaneous leishmaniasis (CL) and visceral leishmaniasis (VL). VL is the more severe of the two and, if untreated, may become fatal. The hallmark of VL is the formation of granuloma in the liver or the spleen. In this talk, I present a mathematical model of the evolution of granuloma in the liver. The model is represented by a system of partial differential equations and it includes immigration of cells from the adaptive immune system into the granuloma; the rate of the influx is determined by the strength of the immune response of the infected individual. It is shown that parasite load decreases as the strength of the immune system increases. Furthermore, the efficacy of a commonly used drug, which increases T cell proliferation, increases in a person with stronger immune response. The model also provides an explanation of why, in contrast to humans, mice recover naturally from VL in the liver.