

1125-AA-2685 **Shelby Nicole Wilson*** (shelby.wilson@morehouse.edu), Mathematics Department, 830 Westview Drive, Atlanta, GA 30314. *Determining Near-Optimal Treatment Protocols via Nonlinear Cancer Models.*

This work aims to develop evidence-based treatment protocols designed to optimize the effectiveness of combined cancer therapies. Two mathematical models of cancer growth- each validated with preclinical data are considered. Each model studies the effects of chemotherapy when combined with a non-traditional anti-cancer therapy. The first model considers the dynamics of chemotherapy in the context of the primary immune response, immune vaccines and tumor growth. Second, we study chemotherapy in a context where it is combined with anti-angiogenic drugs (drugs that prevent blood vessel growth). The goal of this work is to determine optimal treatment protocols for combined cancer treatments. A number of heuristic algorithms (genetic algorithms, simulated annealing, Particle swarm algorithms) are used to propose treatment protocols designed to maximize treatment outcomes. (Received September 20, 2016)