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Muhammad Usman* (musman1@udayton.edu), 300 College Park, Dayton, OH 45469-2316, and **Giacomo Flora** and **Christopher Yakopcic**. *A Numerical Study and Stability Analysis of a Model for In Vitro Inhibition of Cancer Cell Mutation*. Preliminary report.

Human homeostasis is the body's ability to physiologically regulate its inner environment to ensure its stability in response to changes in the outside environment. An inability to maintain homeostasis may lead to death or disease, which is caused by a condition known as homeostatic imbalance. Normal cells follow the homeostasis when they proliferate and cancer cells do not. This work describes a model consisting of three reaction-diffusion equations representing in vitro interaction between two drugs. One inhibits proliferation of cancerous cells, and the other destroys these cells. The growth of in-vitro cancer cells has been studied using two numerical methods: the Predictor-Corrector and the Operator Splitting method. A stability analysis of the model is performed with and without diffusion applied to the model. MATLAB is used to perform the stability analysis of the model. (Received September 24, 2012)