Meeting: 1003, Atlanta, Georgia, SS 9A, AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, I

1003-92-187 **Bo Deng** (bdeng@matrh.unl.edu), Dr. Bo Deng, Department of Mathematics, University of Nebraska at Lincoln, Lincoln, NE 68588, **Vladimir V Ufimtsev** (vufimtsev@mail.unomaha.edu), Vladimir Ufimtsev, 6506 University Drive S., 537 C, Omaha, NE 68132, and **Melissa Wilson*** (maw80474@creighton.edu), Melissa Wilson, 3105 Dewey Ave, Apt 1, Omaha, NE 68105. *Stoichiometric Tumor Model: Phosphorus Flow.*

A stoichiometric model of tumor growth within a system was created. The system looked at is fairly general and can be modified for use with different organs. We treat the system as a chemostat in order to trace the flow of phosphorus and the effects of phosphorus deficiency and possibly toxicity. The system works as a chemostat with: the arteries bringing in the phosphorus supply through the blood stream, the organ and tumor growing within the system based on the availability of phosphorus and space with phosphorus continually flowing out of the system through the veins. A tumor able to vascularize is under consideration, thus the model tracks the growth/decay of: healthy cells, tumor cells and vessels. We conclude the model by considering the influence of naturally occurring effector cells, immunotherapy and chemotherapy on our model. (Received August 21, 2004)