1093-92-320   **Hye-Won Kang*** (`hwkang@umbc.edu`). *A mathematical model for microRNAs in lung cancer.*

Lung cancer is the leading cause of cancer-related deaths. Lack of early detection and the limited options for targeted therapies are the main factors to contribute to these statistics. MicroRNAs represent a class of non-coding RNAs that regulate genes and may serve as both diagnostic and prognostic biomarkers in lung cancer. Based on the experimental data, two microRNAs, miR-9 and let-7, are dysregulated in non-small cell lung cancer (NSCLC) and this feature may be helpful to identify lung cancer. In this talk, I will suggest a key signaling pathway involving two microRNAs and introduce a mathematical model using a system of differential equations. Simulations of the model demonstrate that EGFR and Ras mutations in NSCLC, which lead to the process of epithelial-mesenchymal transition, result in miR-9 upregulation and let-7 suppression. By putting random perturbation on microRNAs using stochastic differential equations, I can conclude that the signaling pathway is somewhat robust against random input into miR-9 and more strongly robust against random input into let-7. (Received August 19, 2013)