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Natalia L Komarova* (komarova@math.uci.edu), Dept of Mathematics, University of California Irvine, Irvine, CA 92697. *Cancer as somatic evolution.*

Even though much progress has been made in main stream experimental cancer research at the molecular level, traditional methodologies alone are insufficient to resolve many important conceptual issues in cancer biology. For example, for the most part, it is still unknown how cancer originates, what drives its progression, and how treatment failure can be prevented. In this talk, I will describe novel mathematical tools which help obtain new insights into these processes. I will also show how the mathematical insights are combined with experimental studies through collaborations with cancer biologists. The main idea is to study cancer as an evolutionary dynamical system on a selection-mutation network. I will discuss the following topics: Stem cells and tissue architecture; Cancer and aging, and Drug resistance in cancer. (Received February 01, 2006)