1010-92-105 **Danail G Bonchev*** (dgbonchev@vcu.edu), P. O. Box 842030, Richmond, VA 23284, and **Lemont B Kier** and **Sterling Thomas**. *Cellular Automata Modeling of Signaling and Metabolic Pathways.* Preliminary report.

Cellular automata studies were performed on the mitogen-activated protein kinase (MAPK) signaling cascade and the apoptosis pathway. Probabilistic rules were introduced to model the biochemical reactions involved, the transitional probability of the randomly joining automata cells playing a major role. The outcome includes the variations in the steady-state concentration of ingredients in time (temporal models) or the variations produced by changes in the initial concentrations and enzyme/inhibitor activity (spatial models). The probability ranges were determined for the maximum signal amplification in the MAPK cascade, and for the prevailing of survival or self-programmed death outcome in the apoptosis pathway. Dynamic patterns were identified, which mark ways for controlling cellular processes. (Received August 22, 2005)