

1048-92-29

David Chan* (dmchan@vcu.edu), Department of Mathematics, Virginia Commonwealth University, 1001 West Main Street, Richmond, VA 23229, and **H. Sedaghat, M.A. Wood, J.W. Cain, C.K. Cheng** and **C.M. Baumgarten**. *Complex temporal patterns of spontaneous initiation and termination of reentry in a loop of cardiac tissue.*

A two-component model is developed consisting of a discrete loop of cardiac cells that circulates action potentials as well as a pacing mechanism. Physiological properties of cells such as restitutions of refractoriness and of conduction velocity are given via experimentally measured functions. The dynamics of circulating pulses and the pacer's action are regulated by two threshold relations. Patterns of spontaneous initiations and terminations of reentry (SITR) generated by this system are studied through numerical simulations and analytical observations. These patterns can be regular or irregular; causes of irregularities are identified as the threshold bistability (T-bistability) of reentrant circulation and in some cases, also phase-resetting interactions with the pacer. (Received December 15, 2008)