1086-92-316   **Weijiu Liu*** (`weijiul@uca.edu`), 201 Donaghey Ave, Conway, AR 72035. *Numerical Evidence for Sustaining Normal Intracellular Calcium Oscillations by Store-Operated Calcium Entry Alone in Pancreatic β-Cells.* Preliminary report.

We develop a mathematical model to numerically analyze a complex effect of depletion of intracellular calcium stores on intracellular calcium oscillations in pancreatic β-cells. When store-operated calcium entry (SOCE) is presented and endoplasmic reticulum (ER) calcium is depleted, our numerical simulation confirmed an experimental observation that the normal calcium oscillations persist and actually are accelerated. This implies that SOCE alone can sustain the normal calcium oscillations. Also our numerical simulation showed that normal membrane potential oscillations are sustained by SOCE alone. This numerical result has not been tested yet by an experiment. When SOCE is blocked or very small, our numerical simulation confirmed other experimental observations that ER calcium can sustain normal calcium oscillations and the depletion of ER calcium transforms the normal calcium oscillations into a sustained calcium increase with oscillations of much higher frequency and much smaller amplitude, and transforms the normal membrane potential oscillations to a pattern of continuous spiking. (Received August 20, 2012)

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