

Abstract Submitted
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Calcium Signaling enhancement during oocyte maturation PETER JUNG, Department of Physics and Astronomy, Ohio university, GHANIM ULLAH, Ohio University, KHALED MACHACA, Department of Physiology and Biophysics, University of Arkansas for Medical Sciences — A Ca^{2+} signal with a special spatial and temporal characteristic universally removes cell-cycle arrest after fertilization of a mature egg cell. The Ca^{2+} signal is characterized by a fast rise of intracellular Ca^{2+} and a slow decay on the time scale of minutes. We use computational modeling of Ca^{2+} release on the microscale (Ca^{2+} puffs) and cell-scale in conjunction with experimental knowledge of the changes in the Ca^{2+} signaling apparatus during oocyte maturation and changing signaling patterns to explore the relationship between organization and sensitivity of IP3 receptors and SERCA pumps and the resulting signaling patterns. We hypothesize that potentiation of the IP3 receptors during oocyte maturation is the main cause for the differentiation in the signaling patterns.

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