



A Mathematical Study of Calcium Oscillations and Waves

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VDM Verlag. Paperback. Condition: New. 176 pages. Dimensions: 8.7in. x 5.9in. x 0.4in. Over the years, the crucial importance of calcium for many biological functions has been well established. There are many physiological processes in which calcium plays a significant role in a direct or indirect manner. It has been observed experimentally that, in many cell types, calcium fluxes across the plasma membrane affect inositol trisphosphate IP3-induced calcium oscillations. Since IP3-induced calcium oscillations involve the cycling of calcium to and from the endoplasmic reticulum, it is not well understood how they can be so strongly affected by membrane fluxes. In this work, we use a mathematical model to answer this question. Our model predictions are confirmed by experimental results. Although the mathematical model refers to a particular cell type, it also allows us to address some aspects of calcium signalling in general. Further we study the propagation of intercellular calcium waves in a pancreatic acinus. The effect of inter-cellular coupling on the oscillatory dynamics is also investigated. It is demonstrated that junctional calcium diffusion can account for the co-ordination and synchronisation of cytosolic calcium oscillations in a coupled triplet of cells. This item ships from multiple locations. Your book may arrive...



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