

## Numerical Model to Study Calcium and Inositol 1,4,5-Trisphosphate Dynamics in a Myocyte Cell

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**Abstract :** Calcium signalling is one of the most important intracellular signalling mechanisms. A lot of approaches and investigators have been made in the study of calcium signalling in various cells to understand its mechanisms over recent decades. However, most of existing investigators have mainly focussed on the study of calcium signalling in various cells without paying attention to the dependence of calcium signalling on other chemical ions like inositol-1; 4; 5 triphosphate ions, etc. Some models for the independent study of calcium signalling and inositol-1; 4; 5 triphosphate signalling in various cells are present but very little attention has been paid by the researchers to study the interdependence of these two signalling processes in a cell. In this paper, we propose a coupled mathematical model to understand the interdependence of inositol-1; 4; 5 triphosphate dynamics and calcium dynamics in a myocyte cell. Such studies will provide the deeper understanding of various factors involved in calcium signalling in myocytes, which may be of great use to biomedical scientists for various medical applications.

**Keywords :** calcium signalling, coupling, finite difference method, inositol 1, 4, 5-triphosphate

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