

SY-I-2

MOUSE HEART AND CALCIUM SIGNALING SYSTEMS

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Systems biology is a newly emerging biological field that seeks system-level understanding of biological phenomena at the levels of e.g. molecules, cells, tissues, organs, and individuals. Our interdisciplinary project examines mouse cardiac calcium signaling systems especially focusing on excitation-contraction coupling (<http://sbrg2.gist.ac.kr>). The essential second-messenger role that the intracellular Ca^{2+} concentration plays in signal transduction processes is now widely known. The intracellular Ca^{2+} signaling generated by Ca^{2+} entry through the surface membrane and Ca^{2+} release from intracellular Ca^{2+} stores is associated with a diverse array of cellular phenomena. Initially, we have compiled a defined set of genes associated with mouse cardiac excitation-contraction coupling (ECC) and, then, their expression correlation networks, protein expression levels and interaction networks, effects of various genetic perturbations and altered functions have been studied using variety of molecular methods in order to construct in silicomodels for myocardial Ca^{2+} homeostasis and hypertrophy. Our current and future studies will be discussed in the presentation.

Key Words: Calcium signaling, Heart, Excitation-contraction coupling, Systems biology