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Signalling pathways of cardiac hypertrophy

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Cardiac hypertrophy is a major predictor of progressive heart disease and an adverse prognosis. Cardiac hypertrophy is recognized as an adaptive process to a variety of physiological and pathological conditions. It is often associated with diseases like ischemic heart disease, hypertension and heart failure. These different diseases induce cardiomyocyte growth which is characterized by an increment in cardiomyocyte size, increased protein synthesis and changes in the organization of sarcomeric structure. Although initially, cardiac hypertrophy plays role as a compensatory response that tries to optimize biomechanical stress and normalize cardiac pump function. But, prolonged hypertrophy may eventually lead to dilated cardiomyopathy, arrhythmia, fibrotic diseases, heart failure and even sudden death.

Cardiac Hypertrophy may result from interaction of various signal transduction pathways such as Peroxisome proliferator activated receptors (PPARs), Calcineurin/Nuclear factor of activated T cells (NFAT), G-protein coupled receptors (GPCRs), Mitogen activated protein kinase (MAPK) etc. The presentation will deal with the various integrative approaches including ligands, receptors, cytoplasmic signal amplifiers and transcriptional effectors that play a major role in cardiomyocyte hypertrophy and ultimately lead to congestive heart failure.