The role of non-coding RNAs in malignant cardiac diseases

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Cardiovascular diseases has become the most serious health threat and represents the majoy cause of morbidity and mortality in China, as in industrialized nations. Since the past decades, Chinese economic boom has tremendously improved people living standard, but also changed people life style boosting the prevanlence of cardiovascular disease, so called disease of modern civilization. This new trend has attracted the main force of research. Many of the studies conducted by Chinese investigators are orientated to understanding the molecular mechanisms of cardiovascular disease. At the molecular level, the long-standing consensus is that cardiovascular disease is associated with sequence mutation (genetic anomaly) and expression deregulation (epigenetic disorder) of non-protein-coding genes. However, new research data have established the non-coding RNAs (ncRNA, including microRNAs, lncRNAs, etc.) as a central regulators of pathogenesis of cardiac disease and potential new therapeutic targets for cardiovascular disease. Over the years, a large body of studies on ncRNAs in cardiovascular disease has been conducted by investigators from our lab, yielding fruitful research and better understanding of ncRNAs as a new layer of molecular mechanisms for the pathogenesis of cardiac disease. In this review, we will give a brief summary of our current status of research in the field of ncRNAs in various cardiac conditions including cardiac arrhythmia, myocardial ischemia, cardiac hypertrophy and heart failure, and in exploring the potential of ncRNAs as novel diagnostic biomarkers and therapeutic targets.