Human Pluripotent Stem Cells: Tools for Cardiovascular Medicine

Human pluripotent stem cells have opened powerful new avenues for innovations in cardiovascular medicine. The basic properties of human pluripotent stem cells will be reviewed. Technologies to differentiate human stem cells to functional cardiomyocytes will be described with particular attention to the role of the extracellular matrix. Modeling of human disease with iPS cell-derived cardiomyocytes is rapidly advancing, and an example of modeling long QT syndrome will be provided. The promise and status of iPS cells for cardiovascular therapies will be described. Current roadblocks to human pluripotent stem cell applications as well as strategies to overcome these challenges will be discussed.