

Maturation and Differentiation of the Human Cardiomyocyte in the First Month of Life

IRB# 2004-036

Principal Investigator: Olaf Reinhartz, MD

Synopsis:

This study uses solely tissue discarded at time of surgery. The purpose of the study is to understand the regenerative potential of heart tissue. Surgical repair of heart defects is more successful if the heart muscle cells still have the ability to multiply and repopulate diseased tissue areas after surgery, including the expansion of the cell population by proliferation and differentiation of cardiac progenitor cells. It is known from animal studies that the ability to increase heart muscle cell number by cell division is lost within the first few months of life, but when this occurs in humans is not known. We will study cells from heart tissue that is removed during repair of certain heart defects to determine if the cells still have the potential to divide. By studying tissue from children at different ages, we will establish when the ability of myocytes to divide is lost and also the dynamics of the progenitor cell population. We believe that knowing when heart cells lose the ability to divide and how resident progenitor cells can participate in post surgical healing will allow better planning of the developmental stage at which many heart surgeries are performed, and provide improved outcomes from these surgeries.