Fetal Cell Differentiation in Maternal Hearts (p 82)

Placentas could be a source of heart-repairing cells, say Kara et al.

Pregnant women with cardiomyopathy are known to have a higher recovery rate than other individuals with the disease. It is also known that during pregnancy, fetal cells can pass to the mother and incorporate into her tissues, sometimes remaining there for years. Kara et al suspected that fetal cells might be contributing to the repair process in mothers with cardiomyopathy. To test this, they induced myocardial infarction in pregnant mice and studied what the fetal cells were doing. They discovered that these cells homed to the injured heart, and once there, they differentiated into cardiomyocytes, smooth muscle cells, and endothelial cells. In fact, the fetal cells could form entirely new blood vessels. Approximately 40% of the fetal cells in the mothers’ hearts expressed a transcription factor, called Cdx2, which is a marker of trophoblast stem cells—the cells that give rise to the placenta during embryogenesis. Until now, trophoblast stem cells had been thought only to contribute to the formation of the placenta. Thus, the new work suggests that placentas, which are routinely discarded in hospital maternity wards, could be a valuable source of multipotent stem cells.

Circadian Infarct Size in STEMI (p 105)

Time of day affects both severity of and recovery from heart attacks in humans, report Reiter et al.

Both blood pressure and baseline heart rate follow circadian rhythms. Even the heart cells themselves display a daily rhythm in their expression levels of clock proteins. Hence, it is not surprising that heart attacks tend to occur during a particular part of the day: the early hours of the morning. But, that the severity of heart attacks and the recovery from them were also worse in these early hours was an unexpected discovery made in mice last year and reported in Circulation Research. Now Reiter et al have found that the same time-of-day effect on severity and recovery also applies to human patients. A retrospective study of 1031 heart attack patients admitted to the Minneapolis Heart Institute between 2006 and 2010 revealed that infarct size was largest in patients that suffered heart attacks at 1 am. The subsequent recovery of left ventricular function was also more impaired in these patients. These results have implications not only for patient prognosis, but also for evaluations of potential ischemia/reperfusion therapies.