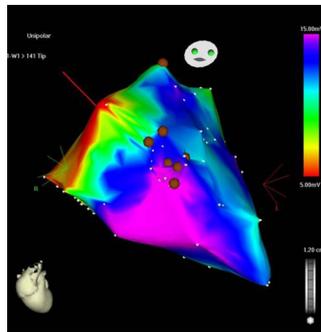


**miR-210 Enhances Atherosclerotic Plaque Stability (p 633)**

**MicroRNA-210 stabilizes vulnerable atherosclerotic plaques, report Eken et al.**

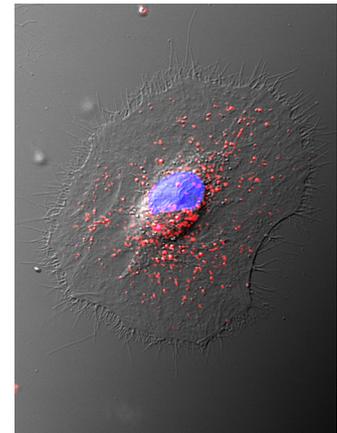
Disruption or destabilization of atherosclerotic plaques often results in the formation of an occlusive thrombus, which leads to tissue ischemia and the onset of clinical symptoms of myocardial ischemia or stroke. Hence, identification and treatment of unstable plaques is likely to be highly beneficial to patients with advanced atherosclerotic disease. Because microRNAs (miRs) offer great potential as therapeutic agents, Eken and colleagues searched for differences in the abundance of miRs in patients with stable and unstable carotid plaques. In a comparison of ~750 miRs expressed in atherosclerotic plaques, the team found that 8 miRs were differentially regulated between patients whose atherosclerosis was asymptomatic versus symptomatic (indicative of plaque instability). Of these, miR-210, present in the stable fibrous cap of atherosclerotic lesions, was the most significantly downregulated in unstable plaques. Furthermore, miR210 was also downregulated in animal models of atherosclerotic lesions, the team showed. And overexpression of this miR, using miR-210 mimics, increased plaque stability in such animals. Boosting miR-210 levels in vulnerable plaques might, therefore, be a means to prevent life-threatening plaque ruptures, say the authors.



**Intramyocardial CD133+ Cells in Refractory Angina (p 670)**

**A trial of bone marrow stem cells for refractory angina yields inconclusive results, according to Wojakowski et al.**

Despite considerable progress in the treatment of coronary artery disease, there remain many patients for whom current therapies do not help. New approaches for such refractory angina patients are thus greatly needed. One potential treatment under study is transcatheter delivery of bone marrow stem cells. Indeed, recent studies have shown that such treatment reduces symptoms and improves quality of life in refractory angina patients. However, bone marrow contains a mixed population of cells, so it is possible that certain subpopulations of these cells are more effective than others in alleviating angina symptoms. CD133-positive bone marrow stem cells, for example, are known to have angiogenic potential, which might improve myocardial perfusion in patients. To test this idea, Wojakowski and colleagues administered transcatheter injections of CD133+ cells to patients with refractory angina. They observed no difference in myocardial perfusion or left ventricle ejection fraction between the test and control patients, but they suggest that with so few patients enrolled, the study might have lacked statistical power. Nevertheless, because the procedure was deemed safe, the authors suggest that a larger scale multicenter study is warranted.



**Pediatric CPC-Derived Exosome Therapy (p 701)**

**Donor age and oxygen levels effect exosomes' reparative potential, say Agarwal and colleagues.**

Stem and progenitor cells are being investigated for their potential to treat coronary artery disease (CAD). It is believed that these cells promote tissue repair via their paracrine effects on myocardial tissue or other noncardiac sites. Cardiac progenitor cells (CPCs), for example, release exosomes—small membrane-bound vesicles containing bioactive components—that have been shown in animal models to improve ventricular remodeling and promote healing after myocardial infarction. Evidence suggests that the effectiveness of stem cell therapies depends on oxygen levels and the age of the donor. To examine whether these factors also influence exosome therapies, Agarwal and colleagues isolated CPC exosomes from newborn babies, infants, and children undergoing heart surgery, and compared their reparative potential with and without hypoxic preconditioning. The team showed that, in rats suffering ischemia-reperfusion injuries, exosomes from newborns were the most effective at improving heart function. They also found that even though the potency of the exosomes diminished with increasing donor age, it could be restored by hypoxic preconditioning. The team went on to show that differences in the microRNA content of the exosomes were predictive of their effectiveness. Hence, it seems likely that microRNA analysis of exosomes from other cell types might reveal additional sources of exosome with high therapeutic potential.

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## In This Issue Ruth Williams

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