GENE THERAPY IN CARDIO-VASCULAR DISEASES ; CONCEPTS, SCOPE & PERSPECTIVES

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The genetic modification of the cells can be performed by three different methods : gene replacement, correction and augmentation. The recombinant DNA molecule of the desired gene is produced and inserted into the somatic cells either *in vivo* or *ex vivo* by various gene delivery systems namely, viral (adeno, adeno-associated or retroviruses) or non-viral (physical or chemical) methods. There are still many limitations of various delivery systems which are yet to be overcome.

The different cardio-vascular diseases where gene therapy holds a promise are for the treatment of *hypercholesterolemia* (familial), *prevention of vascular restenosis* after angioplasties and for *therapeutic angiogenesis* (peripheral vascular angiogenesis for advanced coronary artery disease patients unfit for coronary bypass graft operation either alone or as an adjunct to CABG). The angiogenic gene therapy (AGENT) was first reported for myocardial ischemia. FGF-4 (fibroblast growth factor-4) carried by an adenoviral vector was given by intracoronary route to the patients of chronic stable angina. Gene therapy has the potential to radically affect the disease processes; however, the technique is still evolving. The main obstacle is the successful development of vectors with high transfection efficiency as well as tissue specificities.