DEVELOPMENTS AND NEW MODELS IN HUMAN GENE THERAPY

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The development of viral vectors for efficient transfer and expression of foreign genes in mammalian cells has provided technical support for the concept that some human diseases may eventually be treated through correction of the underlaying genetic defect – gene therapy. A number of important model systems have been developped in which defects of the immune system and other bone marrow derived cells, the liver, the central nervous system, and some tumor cells have been corrected *in vitro* through the introduction of a foreign normal gene. The expression of the human LDL (low densitiy lipoprotein) receptor gene has corrected abnormal cholesterol biosynthesis in enzyme deficient cells. The introduction of the human retinoblastoma gene (Rb) into Rb cells has restored gene product expression and has suppressed the tumorigenicity of the cells. Foreign gene expression in cells grafted to the central nervous system has modified cell survival and behaviour in rat models of Alzheimer's and Parkinson's diseases. These and other studies indicate that the conceptually new form of disease treatment based on correction of the causation genetic defect is likely to become a feasible form of therapy for some human diseases.