

**Gene Transfer  
& Gene Therapy**



# Gene Transfer and Gene Therapy

Proceedings of an E.I. du Pont de Nemours — UCLA Symposium  
Held at Tamarron, Colorado  
February 6–12, 1988

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## Preface

The articles in this volume describe presentations at a meeting entitled **Gene Transfer and Gene Therapy** held at Tamarron, Colorado, February 6–12, 1988. Additional presentations of abstracts can be found in the *Journal of Cellular Biochemistry*, Supplement 12B:158, 1988. The planning for the meeting arose as an outgrowth of the highly successful 1986 UCLA Workshop **Vectors for Gene Transfer in Animals**. The aim of the meeting was to review research in the area of gene expression and gene transfer as it might relate to the goal of conducting somatic gene therapy in humans. The meeting effectively brought together basic researchers and human geneticists working with diseases.

Progress in gene transfer has been made in various species: mouse, *Drosophila*, zebra fish, rat, and other animals. Numerous examples of germ line gene transfer and somatic gene transfer in the mouse were reported. Important new information regarding control of gene expression, including the delineation of distant elements controlling human  $\beta$ -globin expression was presented. There has been a proliferation of knowledge on the cis-regulatory sequences and trans-acting factors which control gene expression. A detailed understanding of these mechanisms will be required for more sophisticated gene transfer and gene therapy efforts.

The meeting provided an up-to-date overview of vectors for gene transfer. Retroviral vector's predominated by a wide margin, although work with other vectors such as vaccinia virus was reported. Retroviral vectors continue to be modified to improve titer and expression. New retroviral packaging cell-lines designed to minimize production of replication-competent virus were reported. Efforts to carry out somatic gene therapy in animals might be viewed as encouraging or discouraging depending on whether one views the cup as half full or half empty. Significant expression in reimplanted bone marrow cells or fibroblasts was reported by a number of groups, but meaningful expression for the remainder of the life of all animals remains elusive.

Extensive time was devoted to discussions on human genetic diseases. Detailed molecular delineation of mutations is available in near innumerable amounts. Important diseases involving liver, bone-marrow derived cells,

central nervous system, muscle and other tissues were described. Although diagnosis for single gene disorders is extremely powerful, there is little ability to treat them. The feasibility of somatic gene therapy varies widely from disease to disease. Strategies for cloning disease genes prior to identification of the gene product represent an important new approach to human genetic diseases. A roundtable discussion was devoted to the ethical considerations for human somatic gene therapy.

Exciting progress was reported for homologous recombination in mammalian cells. Homologous recombination would offer major advantages for somatic gene therapy if it could be achieved. In the shorter term, use of homologous recombination in embryonic stem cells might lead to the development of mouse models for numerous human genetic diseases.

It will be of interest to observe whether the promise of somatic gene therapy bears fruit, and if so, what form such treatment might take. Hopefully, progress in the field will someday justify an additional UCLA symposium.

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