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# CANCER GENE THERAPY

## Past Achievements and Future Challenges

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To all the clinicians, scientists, and various other people who are passionate about cancer research and have dedicated their lives to the advancement of knowledge and the discovery of a cancer cure

# PREFACE

With the coming of the new millennium we are witnessing a revolution in our understanding of cancer genetics. These are very exciting times. Today we have at our disposal the technology to diagnose abnormalities in our cancer genes and the means to correct the deficit and very soon we will have the complete sequence of the human genome.

With the use of gene chip technology the way doctors will be able to assess patients will change completely. Today we can diagnose abnormalities in ten thousand genes and within a short period of time we will be able to screen through our genome and discover potential abnormalities in our proto-oncogenes, tumour suppressor genes, differentiating genes, apoptotic genes and pro-inflammatory genes. In this book various authors have highlighted specific genes that could be expressed, overexpressed, neutralised or harnessed to achieve cancer control.

The problem of transferring the therapeutic gene into the cancer cell has been partly addressed with major developments in the field of naked plasmid DNA, adenovirus, retrovirus and adeno-associated viruses. However, further improvements are yet to be made to achieve significant gene transfer. Gene expression, in particular specificity of gene transfer, is obviously an important issue and one which is highlighted in this book by the use of specific promoter.

There are many potentially promising avenues to pursue to achieve cancer cell apoptosis or necrosis and some pre-clinical and clinical data are promising. Various clinical studies, including the use of Ad p53 and Ad E1B deleted, are progressing from phase II into phase III studies and are showing promise when their use is combined with chemotherapy.

Although progress in this field has been relatively slow, gene therapy has come of age. Already the first gene therapy drug has FDA approval for use in patients with CMV retinitis to save eyesight. Cancer is a more problematic disorder to solve as it involves many overexpressed oncogenes and several deleted or mutated tumour suppressor genes. Although cure is unlikely to happen tomorrow, cancer gene therapy is undoubtedly here to stay.

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