

Murine Metastatic Tumour Models for Cancer Gene Therapy Research

H L Kong,**FAMS, MRCP (UK), M Med (Int Med)*

Abstract

The appropriate use of animal tumour models has a pivotal role in the evaluation of any new anti-cancer therapy. Indeed, animal models of human diseases have been emphasised in the early development and evaluation of gene therapy. Given that most cancer treatment failures and cancer-related mortality are the direct results of metastatic cancers, the increasing use of clinically-relevant metastatic tumour models in the study of cancer therapeutics is both logical and necessary. Murine metastatic tumour models may be established either "experimentally" or "spontaneously". The yield and reproducibility of spontaneous metastasis models can be enhanced through manoeuvres such as using highly-metastatic sublines for primary tumour implantation and orthotopic transplantation. The use of immunodeficient rodents, although popular, suffers from the absence of T-cell responses in the host which may impact on therapeutic efficacy. While many gene therapy strategies today are capable of regressing primary tumours in experimental animals, only a limited number of approaches (viz. genetic immunotherapy and gene-mediated anti-angiogenesis) are designed to address the challenges posed by metastatic tumours. In extrapolating the results of gene therapy in animal models to humans, it is important to appreciate the heterogeneity of the latter populations, and anticipate greater variability in the treatment outcome.

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