Much information can be gained by investigating the consequences of hyperthermia on individual cell populations in vitro, however the precise effects of such a therapeutic modality in vivo depend on the tumour microenvironment and the cellular composition therein. Although the direct cytotoxic effects of hyperthermia on tumour tissue can lead to an immediate reduction in tumour volume, long-term benefits to local and distal tumour recurrence will very much depend on the induction of immunity and the capacity of effector cells to traffic to tumours and elicit their cytotoxic functions. The immunological sequelae to hyperthermia are even more important in those instances when large tumour volumes preclude the delivery of appropriate thermal damage. The development of protective anti-tumour immunity requires a plethora of interactions and responses, the vast majority of which can be influenced by temperatures that are consistent with fever-like temperatures (39 degrees -40 degrees C), as well as hyperthermia treatment (<41 degrees C). This article reviews current knowledge relating to the effects of hyperthermia treatment on aspects of the induction and manifestation of immunological responses that are most pertinent to the development and maintenance of protective anti-tumour immunity.