Protective cancer immunotherapy: what can the innate immune system contribute?

Despite significant efforts to induce protection against malignant diseases, the clinical effects of antitumour vaccines are poor. However, recent studies on a quadrivalent human papilloma virus vaccine suggest that protection against secondary tumour development is feasible. While this scenario benefits rather from antiviral protection than from direct antitumour responses, immunisation against cancers of non-viral origin demands strategies that rely on the circumvention of intrinsic regulatory mechanisms. Strong activation of innate immune cells seems to be key and, thus, the choice of adjuvant determines vaccination efficacy. The recently acquired knowledge about molecular and cellular recognition of microbial molecules suggests how one can modulate innate and adaptive immune reactions to potentially induce robust T- and B-cell reactions capable of prohibiting tumour development and progression. Here, the authors review the present knowledge of innate immune reactions, which may help to define rationales on the design of novel antitumour vaccines.