Natural killer cells: a review of biology, therapeutic potential and challenges in treatment of solid tumors

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Natural killer (NK) cells lead immune surveillance against cancer and early elimination of small tumors. Owing to their ability to engage tumor targets without the need of specific antigen, the therapeutic potential of NK cells has been extensively explored in hematological malignancies. In solid tumors, however, their role in the clinical arena remains poorly exploited despite a broad accumulation of preclinical data. We will review our current knowledge of NK cells' biology, and highlight the challenges facing NK cell antitumor strategies in solid tumors. We then summarize the abundant preclinical attempts at overcoming these challenges, present past and ongoing clinical trial data and finally discuss the potential impact of novel insights on the development of NK cell-based therapies.

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