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Plasmacytoid dendritic cells, a role in neoplastic prevention and progression

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Abstract

© 2015 Stichting European Society for Clinical Investigation Journal Foundation. Background: Plasmacytoid dendritic cells (pDCs) are multifunctional bone-marrow-derived immune cells that are key players in bridging the innate and adaptive immune systems. Activation of pDCs through toll-like receptor agonists has proven to be an effective treatment for some neoplastic disorders. Materials and methods: In this mini-review, we will explore the fascinating contribution of pDCs to neoplastic pathology and discuss their potential utilization in cancer immunotherapy. Results: Current research suggests that pDCs have cytotoxic potential and can effectively induce apoptosis of tumour-derived cells lines. They are also reported to display tolerogenic function with the ability to suppress T-cell proliferation, analogous to regulatory T cells. In this capacity, they are critical in the suppression of autoimmunity but can be exploited by tumour cells to circumvent the expansion of tumour-specific T cells, thereby allowing tumours to persist. Conclusion: Several forms of skin cancer are successfully treated with the topical drug Imiquimod, which activates pDCs through toll-like receptor 7 engagement. Additionally, pDC-based anticancer vaccines have shown encouraging results for the treatment of melanoma in early trials. Future studies regarding the contributions of pDCs to malignancy will likely afford many opportunities for immunotherapy strategies.

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Keywords

Cancer, Immunity, PDC, Plasmacytoid dendritic cells, Tolerance, Tumour