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Editorial: How to circumvent the tumour-promoting effect of cytokine in tumour therapy

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Editorial on the Research Topic

How to circumvent the tumour-promoting effect of cytokine in tumour therapy

Cytokines, a class of soluble proteins that are key mediators of cell communication in the tumour microenvironment (TME), can regulate both innate and adaptive immunity (1, 2). Unfortunately, some tumour-related cytokines, especially pro-inflammatory cytokines (such as TNF, IL-6, and IL-1), have a well-recognized tumour-promoting activity and take part in the various phases of tumour initiation and progression (3, 4). Therefore, the research on the tumour-promoting effect of cytokines will play a key role in further revealing the molecular mechanisms of tumour development and identifying novel targets for tumour therapy. In the current Research Topic “*How to Circumvent the Tumour-promoting Effect of Cytokine in Tumour Therapy*”, we attempted to collect the most-recent progress made in tumour-promoting effect of cytokine. In total, after being peer-reviewed, 5 manuscripts, composed with 3 research articles, 1 review article and 1 brief research report authored by 40 researchers worldwide, were successfully accepted for publication.

Interleukin-32 (IL-32) is an important interleukin cytokine usually linked to innate and adaptive immune responses (5). In recent years, it has been found that IL-32 exhibits both pro- and anti- tumour effects. Aass et al. reported that the activation of toll-like receptors (TLRs) in an inflamed or infectious bone marrow microenvironment may promote IL-32 expression in multiple myeloma cells through NF- κ B activation, and this may contribute to accelerating the disease. They therefore propose that the subgroup of IL-32-expressing patients may benefit from combination treatments where antibiotics, antiviral- or anti-inflammatory drugs are included. To evaluate the diagnosis and treatment of tumour patients, the prediction value of cytokine signaling in immune-related genes (CSIRGs) is needed. Pu et al. defined a novel CSIRGs signature in melanoma through applying a

machine-learning model by single-cell RNA-sequencing datasets. They discovered a 5-CSIRG signature that was substantially related to the overall survival of melanoma patients, which may assist in predicting melanoma patient prognosis, biological characteristics, and appropriate therapy. Autophagy participated in innate immunity, inflammatory response and adaptive immune response by processing antigens and regulating the development and function of lymphocytes (6–8). Based on R software, Yue et al. found that autophagy score and IFNG expression were novel immunotherapy predictive biomarkers, which might play predictive effects through the JAK-STAT signaling pathway. IFNG might be a potential targeted therapy for cisplatin resistant colon cancer and was also a prognostic indicator. Notably, accumulative evidence suggests that the precancerous stem cells (pCSCs)/CSC niche is an inflammatory dominated milieu where contains different cytokines that function as the key communicators between pCSCs/CSCs and their niche and have a decisive role in promoting cancer development, progression, and metastasis (9, 10). Cui et al. presented a systematic review of current and new insights on cytokines, such as interleukin (IL)-4, IL-6, IL-8, IL-17A, IL-22, IL-23, IL-33 and interferon (IFN)- γ , involving in the modulation of pCSC/CSC properties and features in precancerous and cancerous lesions, and discussed the possible mechanisms of adenoma progression to colorectal cancers (CRCs) and their therapeutic potential. Anaplastic large cell lymphoma (ALCL) is characterized by the presence of large anaplastic cells with diffuse and strong expression of CD30 on the cell membrane and in the Golgi region (11). Xiang et al. reported that pSTAT3-Y705/S727 can be used to help distinguish ALK-negative ALCL from CD30^{high} PTCL, NOS, and pSTAT3-S727 expression by tumour infiltrating lymphocytes could predict the prognosis of a subset of PTCL, NOS.

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In conclusion, increasing evidence shows that cytokines are heavily involved in regulating both pro- and anti- tumour activities, such as immune activation and suppression, inflammation, cell damage, angiogenesis, cancer stem-cell-like cell maintenance, invasion, metastasis and etc. New insights into the prognosis and treatment of tumour patients may be provided by the in-depth study of tumour-related cytokines.

Author contributions

LM: Conceptualization, Writing – original draft, Writing – review & editing. JH: Conceptualization, Writing – original draft. JD: Conceptualization, Writing – original draft. YW: Conceptualization, Writing – original draft. JW: Conceptualization, Writing – original draft.

Conflict of interest

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