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Tertiary Lymphoid Structures (Tls) and Plasma Cells: Key Players in Generating Anti-Tumor Antibodies for Cancer Immunotherapy

Iqbal J*

Department of Anatomical Pathology, Singapore General Hospital ,Singapore ,169856

*Corresponding author:

Jabed Iqbal,
Department of Anatomical Pathology, Singapore General Hospital ,Singapore ,169856

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The study by Seow et al. (2020) [3] focused on TNBC, a highly aggressive cancer with limited treatment options. The presence of TLS within TNBC tumors was associated with improved clinical outcomes. These structures exhibited characteristics of mature TLS and contained B cells, T cells, and follicular dendritic cells. Notably, higher densities of plasma cells were observed within the tumor microenvironment in the presence of TLS. Moreover, the plasma cells within TLS produced specific antibodies, including immunoglobulin G (IgG) and immunoglobulin A (IgA), which bound to tumor cells, indicating their potential anti-tumor effector activity.

In a more recent study by Meylan et al. (2022) [2] conducted in RCC patients, TLS were identified as specialized sites for B cell maturation into fully functional plasma cells. The process of B cell maturation within TLS led to the generation of mature plasma cells capable of producing tumor-specific antibodies. These antibodies, predominantly of the IgG class, exhibited specific binding to tumor cells. Importantly, the presence of plasma cell-derived antibodies in RCC was associated with a high response rate to immune checkpoint inhibitors (ICI) and prolonged progression-free survival (PFS) in patients.

The collective findings from these studies provide compelling evidence for the critical role of TLS and plasma cells in cancer immunotherapy. In TNBC, the presence of TLS and associated plasma cells correlated with improved clinical outcomes, suggesting their potential as therapeutic targets. Similarly, in RCC, TLS served as key players in B cell maturation into plasma cells, leading to the production of tumor-specific antibodies that enhanced responses to immunotherapy.

Understanding the underlying biology of TLS and plasma cells in various cancer types, including TNBC and RCC, holds immense therapeutic potential. Targeting TLS and plasma cells through immunomodulatory agents, antibody-based therapies, targeted therapies, vaccines, or combination regimens could enhance the anti-tumor immune response and improve treatment outcomes [3]. However, further research and rigorous clinical trials are needed to fully elucidate the therapeutic implications of targeting TLS and plasma cells in different malignancies.

In conclusion, TLS, B cells and plasma cells have emerged as key players in generating anti-tumor antibodies and modulating immune responses in cancer. The presence of TLS and the production of tumor-specific antibodies by plasma cells within these structures indicate ongoing immune responses and potential therapeutic avenues. Harnessing the potential of TLS and plasma cells through innovative immunotherapeutic strategies holds promise for improving treatment outcomes and transforming the landscape of cancer therapy.

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