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Role of Cytokines in Thyroid Tumor Development

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ABSTRACT

Cytokines play an important role in the development and progression of thyroid tumors by regulating inflammation, immune responses, cell growth, and communication between cells. Thyroid tumors develop due to abnormal growth and multiplication of thyroid cells, which may be influenced by genetic, environmental, and immunological factors. Cytokines are small signalling proteins produced by immune cells and other body cells that help control various biological processes. In thyroid tumor development, certain cytokines, such as interleukins (IL-6, IL-8), tumour necrosis factor-alpha (TNF-α), and transforming growth factor-beta (TGF-β), are involved in regulating cellular activities. These molecules may influence tumour cell proliferation, survival, migration, invasion, and angiogenesis. Some cytokines promote inflammatory responses that can create an environment favourable for tumour development, while others may support immune defence against abnormal cells. IL-6, for example, has been associated with tumour growth and progression through different cellular signalling pathways. Similarly, TGF-β may contribute to changes in tumour cell behaviour and tissue invasion. Understanding the role of cytokines is important for identifying the molecular mechanisms involved in thyroid tumorigenesis. Research on cytokine activity may also help identify potential biomarkers for early diagnosis, disease progression, and treatment response. Therefore, studying cytokines provides valuable insights into thyroid cancer biology and the development of possible targeted therapeutic approaches.