Role of Exosomes in Salivary Gland Tumors and Technological Advances in Their Assessment

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Streszczenie

Salivary gland tumors (SGTs) are rare and diverse neoplasms, presenting significant challenges in diagnosis and management due to their rarity and complexity. Exosomes, lipid bilayer vesicles secreted by almost all cell types and present in all body fluids, have emerged as crucial intercellular communication agents. They play multifaceted roles in tumor biology, including modulating the tumor microenvironment, promoting metastasis, and influencing immune responses.This review focuses on the role of exosomes in SGT, hypothesizing that novel diagnostic and therapeutic approaches can be developed by exploring the mechanisms through which exosomes influence tumor occurrence and progression. By understanding these mechanisms, we can leverage exosomes as diagnostic and prognostic biomarkers, and target them for therapeutic interventions. The exploration of exosome-mediated pathways contributing to tumor progression and metastasis could lead to more effective treatments, transforming the management of SGT and improving patient outcomes. Ongoing research aims to elucidate the specific cargo and signaling pathways involved in exosome-mediated tumorigenesis and to develop standardized techniques for exosome-based liquid biopsies in clinical settings. Exosome-based liquid biopsies have shown promise as non-invasive, real-time systemic profiling tools for tumor diagnostics and prognosis, offering significant potential for enhancing patient care through precision and personalized medicine. Methods like fluorescence, electrochemical, colorimetric, and surface plasmon resonance (SPR) biosensors, combined with artificial intelligence, improve exosome analysis, providing rapid, precise, and clinically valid cancer diagnostics for difficult-to-diagnose cancers.

Słowa kluczowe

saliva-derived exosomes, salivary gland tumors, liquid biopsy, exosomes, tumor microenvironment, saliva, biosensor

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