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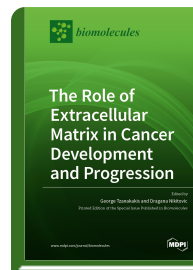
Special Issue Reprint

The Role of Extracellular Matrix in Cancer Development and Progression

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The extracellular matrix (ECM) scaffold, which surrounds and supports the cells in tissues, consists of fibrillar proteins, proteoglycans, glycosaminoglycans, signaling molecules, and enzymes involved in its remodeling. The stages of cancer progression, e.g., local invasion, intravasation, extravasation, distant invasion and immunosuppression, are obligatorily perpetrated through interactions of these tumor cells with the ECM. Cancer-related ECM changes can be exploited for the evaluation of disease progression, anticancer therapy development, and monitoring of therapy response. Thus, in breast cancer, hyaluronan-mediated wound repair mechanisms are hijacked to promote tumor development. Altered mechanical properties of the pancreatic cancer ECM are immunosuppressive and prevent the penetration of cytotoxic chemotherapy agents. The expression of the proteoglycan syndecan-4 is modulated by anticancer drugs, suggesting its potential druggability capacity. Another proteoglycan, lumican, is proposed as a cancer prognosis marker, chemoresistance regulator, and cancer therapy target. Due to their remodeling properties, the MMPs are vital mediators and important therapeutic targets. Treatment of breast cancer cells with sulfated hyaluronan has been shown to attenuate tumor cell growth, migration, and invasion. Extracellular vesicles (EVs), comprising exosomes, microvesicles, and apoptotic bodies, are released by all cells into the ECM and body fluids and can be utilized as diagnostic markers in malignant pleural mesothelioma. These exciting developments encourage tumor biology scientists for further creative research.



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