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THE ROLE OF THE EXTRACELLULAR MATRIX IN BREAST CANCER PATHOGENESIS

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Extracellular matrix (ECM) is a structural basis for tissue spatial organization and serves as a regulation environment, providing biochemical and biomechanical mediators necessary for differentiation and migration of the cells. The ECM is responsible for modulation of immune reactions, angiogenesis initiation and coagulation homeostasis maintenance. The ECM provides crucial microenvironment for both normal and neoplastic cells. Like the genetic modifications of neoplastic cells are the reason for malignancy, ECM coupling alterations control most of the behavioral aspects of neoplastic cells, including their development and methastasy. The biochemical and biomechanical mediators of ECM modulate proliferation, resistance to factors promoting cell death, invasion, immune tolerance, etc. Adhesion molecules, protolithic enzymes and proinflammatory cytokines produced by neoplastic cells are responsible for local ECM remodeling. In addition to ECM, conditions for progression and metastasis are supported by paraneoplastic factors that involve leukocytes, thrombocytes, and coagulation factors. They form a premetastatic niche in the early stages of ECM remodeling and further protect cells from immune system during tumor dissemination. Nowadays data from ECM studies are accented on the prognostic value of ECM components or their individual stimulation/inhibition. In this review, we discuss modern data about the role of EMC in the neoplastic pathogenesis, as well as research perspectives and possible directions of therapeutic approaches for complex treatment of breast cancer.

Keywords: breast cancer, extracellular matrix, metalloproteinases