

[Role of Extracellular Matrix in Breast Cancer Initiation and Progression](#) (Review)

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Introduction: Extracellular matrix (ECM) is a three-dimensional and non-cellular scaffold that forms in embryonic stages of all organs. ECM is a complex network of proteins, glycoproteins and proteoglycans including collagens, hyaluronan, tenascin C and periostin that not only maintains tissue structure, but also regulates cellular functions such as self-renewal, migration and differentiation.

Methods: To review current knowledge regarding the role of extracellular matrix during breast carcinogenesis, published papers including key words extracellular matrix, breast carcinogenesis and breast cancer progression, were extracted from PubMed, Scopus, Web of Science, and Google Scholar.

Results: Research in the field of breast cancer has shown that deregulation of ECM remodeling is responsible for cancer initiation. In this regard, abnormal changes in the amount of ECM components, such as increased deposition of collagen, changes biochemical composition of ECM and thus, induce malignant transformation. In addition, specific components of ECM are involved in cancer progression. For example, abnormal deposition of collagen in tumor stroma leads to cancer progression and women with dense breast show a 4 to 6-fold increase in breast cancer risk. Other mechanisms by which ECM contributes to cancer pathogenesis are acting as a barrier to chemotherapy, dysregulating interaction of immune cells with cancer cells, stimulating integrin signaling through increased ECM stiffness, paving the way for homing of new metastatic cells, providing survival and proliferative signals, stimulating cell migration to distant locations, and modulating angiogenesis.

Conclusion: Growing evidence has confirmed the role of ECM remodeling in breast carcinogenesis. Hence, diversity and heterogeneity of ECM components and functions make them excellent targets to design therapeutic strategies against breast cancer cells.

Keywords: Extracellular matrix, Breast carcinogenesis, Breast cancer progression.