

Nagaland reviews impact of macrophage differentiation in breast cancer metastasis

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A research team lead by Nagaland University along with leading national research institutions, have published an in-depth review paper analysing the role of the tumour microenvironment in breast cancer initiation and metastasis. The review placed a special emphasis on immune cell behaviour and therapeutic implications.

Breast cancer continues to be the most frequently diagnosed cancer among women globally and contributes to nearly 15% of cancer-related deaths in females, underscoring the urgent need for improved mechanistic understanding and more effective therapeutic strategies.

The study focused on tumour microenvironment, a dynamic cellular ecosystem that plays a decisive role in cancer progression. In particular, researchers examined tumor-associated macrophages, key immune cells that can either suppress or promote tumour growth depending on microenvironmental cues.

While macrophages typically function in immune surveillance and phagocytosis, the study highlights how their polarisation toward the M2 phenotype can facilitate tumour survival, angiogenesis, tissue remodelling, invasion, and distant metastasis.

By systematically evaluating existing global literature, the study explains how invasive breast cancer cells manipulate macrophage behaviour through cytokine and chemokine signalling pathways, including colony-stimulating factor-mediated activation.