Novel mechanism for inflammatory protein-induced metastasis in breast cancer

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One out of eight women in the United States will get breast cancer during their life. Invasive ductal carcinoma (IDC) is the most commonly diagnosed breast cancer in women, and it is a serious problem for patients as it metastasizes, decreasing 5-year patient survival from almost 100% to only approximately 30%. This makes studying the mechanisms that promote metastasis of critical importance. The stroma, or extracellular matrix (ECM), of the tumor microenvironment plays an important role in IDC progression and metastasis. Specifically, the density, stiffness, and orientation of collagen I fibers in the stroma all impact IDC motility, invasiveness, and metastasis. Aligned collagen fibers in the ECM provide pathways for tumor cells to migrate more easily through the stroma to nearby vasculature and tissue. Lysyl oxidase-like 2 (LOXL2) is an enzymatic protein that is implicit in remodeling the ECM, doing so by crosslinking collagen I fibers. High tumor LOXL2 expression levels have been associated with decreased prognosis for breast cancer patients. Our lab has shown that the proinflammatory cytokine oncostatin M (OSM) leads to the overexpression/secretion of LOXL2. Thus, we hypothesize that OSM-induced LOXL2, and subsequent collagen I fiber crosslinking and alignment will lead to an increase in IDC invasion and metastasis. Our lab's exciting findings will be discussed and provide a new paradigm through which the proinflammatory cytokine OSM promotes metastatic breast cancer progression. Understanding the nuances in IDC invasion and metastasis will lead to better potential therapeutics being developed in our lab to combat metastatic breast cancer.