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BUSM researchers discover new pathway and protein involved in metastasis of breast cancer

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Researchers have identified a new pathway and with it a protein, BRD4, necessary for breast cancer cells to spread.

The findings, which appear in the journal *Cancer Research*, may provide a new target to suppress breast cancer metastasis.

Triple-negative breast cancer is considered the worst subgroup of breast cancer. It is highly aggressive and responds poorly to the current therapeutic tools resulting in a dismal prognosis for patients. Furthermore, the lack of identified targets has limited the development of new drug strategies.

Researchers from Boston University School of Medicine (BUSM) used breast cancer cell lines that present the clinical characteristics of an aggressive breast cancer subtype (clinically described as a triple-negative breast cancer). They then used an experimental design to model cancer cell metastasis. By suppressing the expression of the protein BRD4 in these cell lines, they observed that their dissemination capabilities were blocked, indicating that BRD4 drives breast cancer dissemination. In addition, they conducted a screening analysis of human breast tumors and found that tumors with a high expression of BRD4 were more likely to metastasize.

"The current treatment options for a triple-negative cancer are unacceptably limited. It is crucial to identify new therapeutic targets to tackle challenging cancer types, including triple negative breast cancer. BDR4 targeting represents an innovative strategy to ablate breast cancer metastasis," explained lead investigator Guillaume Andrieu, PhD, a post-doctoral research associate at Boston University School of Medicine.

Although obesity per se is not thought of as a carcinogen, the abnormal, inflamed microenvironments found in obesity are critical for progression, invasion and metastasis of triple negative breast cancer. "Bromodomain and ExtraTerminal domain (BET) proteins, which include BRD2, BRD3 and BRD4, are known to regulate production of inflammatory mediators. Our study proposes that BRD4 couples inflammation to breast cancer dissemination.

Thus, small molecules that block BET proteins possess anti-inflammatory properties that can be useful for therapy," he added.

Although these findings primarily focus on breast cancer and metastasis, the researchers plan to expand their results to the treatment of prostate cancer, which they believe has similar pathways involved in its metastasis.

Source:

Boston University Medical Center