SMARCAD1 KNOCKDOWN UNCOVERS ITS ROLE IN BREAST CANCER CELL MIGRATION, INVASION AND METASTASIS

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Abstract- Breast cancer is the most common cancer seen in women worldwide and breast cancer patients are at high risk of recurrence in the form of metastatic disease. Identification of genes associated with invasion and metastasis is crucial in order to develop novel anti-metastasis targeted therapy. It has been demonstrated that the DEAD-BOX helicase DP103 was implicated in breast cancer invasion and metastasis. SMARCAD1 is also a DEAD/H box-containing helicase, suggested to play a role in genetic instability. However, its involvement in cancer migration, invasion, and metastasis has never been explored. Using two different designs of shRNA targeting SMARCAD1, we investigated the impact of SMARCAD1 knockdown on the migration, invasion, and metastasis potential of the breast cancer cells MDA-MB-231 and T47D. We observed that SMARCAD1 knockdown in the invasive breast cancer cells MDA-MB-231 unlike in the non-invasive breast cancer cells T47D was associated with an increased cell-cell adhesion and a significant decrease in cell migration, invasion, and metastasis due at least in part to a strong inhibition of STAT3 phosphorylation. These results indicate that SMARCAD1 is involved in breast cancer metastasis and can be a promising target for metastatic breast cancer therapy.