Spotlight

By Anne Forde

Adhesion protein is an early warning of metastasis

Contié et al.
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Periostin is an adhesion protein that is thought to have a role in bone formation. The protein has also been found to be overexpressed in several cancers and elevated serum periostin levels have been detected in patients with breast, but not lung, cancer bone metastases.

In this study, the authors investigated the nature of periostin expression in breast cancer bone metastases. To do this, human breast cancer cells were injected in mice. Then, 18 days later, half the tumor-bearing mice were treated with zoledronic acid (ZOL), a drug that inhibits cancer-induced bone destruction, but not tumor progression.

Two weeks later, the extent of tumor burden and bone destruction was assessed. The osteolytic lesions in tumor-bearing mice treated with ZOL were 60% smaller than in untreated animals. However, serum periostin levels were significantly raised in both the untreated and ZOL-treated, tumor-bearing mice. Furthermore, evidence of intense periostin staining in the stromal environment was seen in the metastatic tissue of both groups but not in unaffected healthy tissue.

The major question was, however, where the periostin that was detected in the serum and metastatic lesions had originated. The authors used quantitative PCR to differentiate human and mouse periostin in the mouse bone tissue. Mouse, but not human periostin was detected: it was 8 times higher in mice with full bone metastases and 4 times higher in mice treated with ZOL.

These findings show that metastatic tissue, and not the primary tumor is likely to be responsible for the increased periostin serum levels. In this experimental model, the early warning of periostin overexpression appears to be coming from stromal cells in the metastatic bone tissue. Therefore, periostin could be a useful indicator of early or low-grade metastasis.