Tracking breast cancer cells on the move

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Breast cancer cells frequently move from their primary site and invade bone, decreasing a patient's chance of survival. This process of metastasis is complex, and factors both within the breast cancer cells and within the new bone environment play a role. In next week's *Journal of Biological Chemistry* "Paper of the Week," Roger Gomis and colleagues at the Institute for Research in Biomedicine in Spain investigated how breast cancer cells migrate to bone.

In particular, they examined the role of NOG, a gene important to proper bone development. Previously, NOG was associated with bone metastasis in prostate cancer, but its specific role in breast cancer to bone metastasis remained unknown.

Gomis and colleagues showed that once breast cancer cells are on the move NOG enables them to specifically invade the bone and establish a tumor. It does this in two ways. First, NOG escalates bone degeneration by increasing the number of mature osteoclasts (bone cells that break down bone), essentially creating a spot in the bone for the metastatic breast cancer cells to take up residence. Second, NOG keeps the metastatic breast cancer cells in a stem-cell-like state, which enables them to propagate and form a new tumor in the bone environment.

Gomis explains that the reason NOG expression leads to an increased potential for breast cancer to bone metastasis is because it not only affects features inherent to aggressive cancer cells (such as the ability to establish a new tumor) but also influences properties of the bone environment (such as osteoclast degeneration of bone).

More information: "Identification of NOG as a specific breast cancer bone metastasis-supporting gene" by Maria Tarragona, Milica Pavlovic, Anna Arnal-Estapé, Jelena Urosevic, Mònica Morales, Marc Guiu, Evarist Planet, Eva González-Suárez, Roger R. Gomis, www.jbc.org/content/early/2012 … 355834.full.pdf+html

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