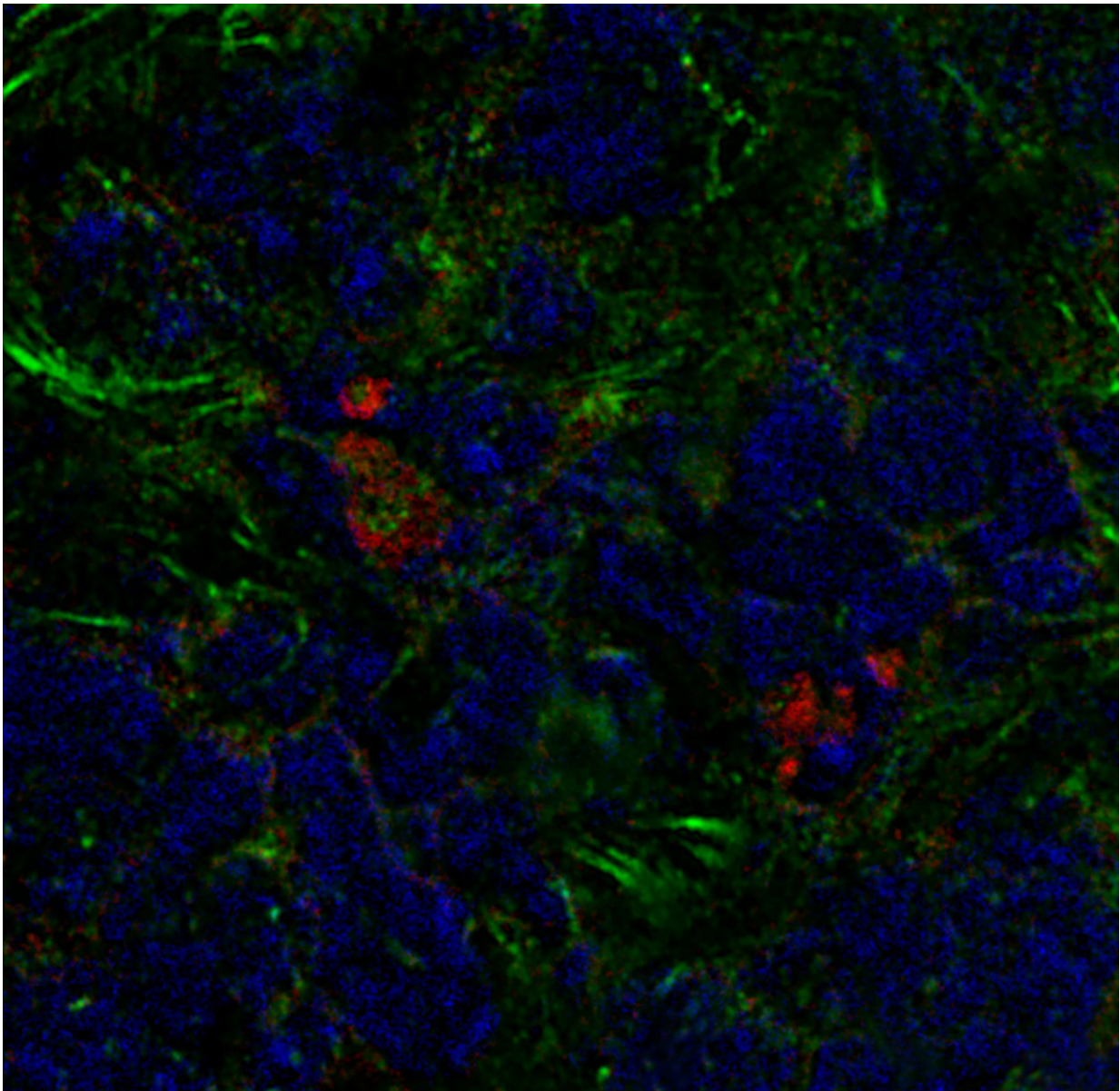


# Breast cancers enhance their growth by recruiting cells from bone marrow

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A mouse breast tumor contains bone marrow-derived fibroblasts (red) as well as other cancer-associated fibroblasts (green). Credit: Raz et al., 2018

Researchers in Israel have discovered that breast tumors can boost their growth by recruiting stromal cells originally formed in the bone marrow. The study, which will be published November 23 in the *Journal of Experimental Medicine*, reveals that the recruitment of bone marrow-derived fibroblasts lowers the odds of surviving breast cancer, but suggests that targeting these cells could be an effective way of treating the disease.

Within [solid tumors](#), cancer cells are surrounded by other cell types that, though not cancerous themselves, boost tumor growth and metastasis. Breast tumors, for example, contain large numbers of [fibroblast](#) cells that promote cancer cell proliferation, inflammation, and the formation of new blood vessels to supply the growing tumor with nutrients and oxygen. Many of these cancer-associated fibroblasts are derived from the neighboring breast tissue, but others seem to come from elsewhere in the body.

Neta Erez and colleagues at the Sackler School of Medicine, Tel Aviv University, discovered that, in mice with breast cancer, a significant number of cancer-associated fibroblasts are derived from [bone marrow](#) cells called mesenchymal [stromal cells](#) (MSCs). The researchers found that [breast tumors](#) can recruit MSCs from the bone marrow and cause them to develop into fibroblasts.

These bone marrow-derived fibroblasts are different from other cancer-associated fibroblasts. They lack, for example, a key cell signaling protein called PDGFR $\alpha$ . But bone marrow-derived fibroblasts are particularly effective at stimulating the formation of new blood vessels

because they produce large amounts of a protein called clusterin. Tumors containing bone marrow-derived fibroblasts were therefore more vascularized and grew faster than tumors that only contained breast-derived fibroblasts.

Erez and colleagues found that human breast cancers also contain fibroblasts lacking PDGFR $\alpha$ , suggesting that human tumors may also recruit bone marrow-derived cells. Moreover, tumors containing lower levels of PDGFR $\alpha$  tended to be more deadly, suggesting that the recruitment of bone marrow-derived fibroblasts is a crucial step in [breast cancer](#) progression.

"Our study shows that the recruitment of bone marrow-derived fibroblasts is important for promoting tumor growth, likely by enhancing blood vessel formation," Erez says. "Understanding the function of these cancer-associated fibroblasts could form the basis of developing novel therapeutic manipulations that co-target bone marrow-derived fibroblasts as well as the cancer cells themselves."

**More information:** Raz et al., 2018. *J. Exp. Med.* [DOI: 10.1084/jem.20180818](https://doi.org/10.1084/jem.20180818)

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