

One experiment

Studying cancer in its natural environment — at tumor sites in living animals — provides insights scientists can't obtain when they look at cancer cells isolated in culture dishes. CSHL's Mikala Egeblad and her team have been making time-lapse images of mouse mammary tumors *in vivo*, to learn how tumor cells interact with the tissue in which they are embedded, called stroma.

This image is one frame from a movie made by Egeblad's team — one experiment in a series showing what happens when an anti-cancer drug is injected into a mouse with a breast tumor. The tumor's (blue) lobe-like structure is fed by blood vessels that run between the lobes, invisible here. Spectacularly visible is the fluorescently dyed orange reagent that represents the drug in this experiment. It has leaked from the vessels into stromal space. In the stroma, too, one sees green blotches, cells of the mouse's innate immune system. Mostly macrophages, these cells are responding to the tumor as if it were a wound, bringing growth factors and other agents to help with tissue repair — which in this case only tends to fuel tumor growth. "We're showing one reason why treating cancer is so tricky," explains Egeblad. "The tumor and its environment are in constant flux. We're testing approaches to treat with this in mind, trying to get more drug into the tumor and learning how the innate immune system at different disease stages hinders and helps tumor-fighting, with the goal of getting existing drugs to work better."

Peter Tarr

