

One experiment

Appearances can be deceiving. This image, made by graduate student Matthew Camiolo in the lab of Assistant Professor Raffaella Sordella, seems as captivating as a stained glass window. In fact, it takes us to a cellular battleground the size of a pinhead within a human lung cancer tumor. It's part of one experiment now underway in the Sordella lab, whose members are seeking to understand what makes certain tumors resistant to targeted therapy and what mechanisms lead some cells to become metastatic.

In prior studies, Sordella's lab noticed differences within lung cancer and lung cancer-derived cell lines. Some cancerous epithelial cells had acquired new features and changed their appearance from round to elongated. Importantly, these cells were resistant to the drug Tarceva (erlotinib). The team developed a series of stains that make visible what they postulate are useful markers of this transformation, called an epithelial-to-mesenchymal transition, or EMT.

The team is currently moving closer to decoding the master regulatory mechanisms that govern this switch toward EMT. In this image, the central mass of round epithelial cells with red borders and blue nuclei are cancerous but haven't undergone the transition. But in a looping arc surrounding these cells we see oblong cells, yellow and green in hue. Green indicates an abundance of the cell-surface marker CD44, characteristic of mesenchymal-like cells. Yellowish cells express both CD44 and a marker, colored red, expressed by all tumor cells. In correlating the observed staining pattern with tumor status and linking that to prognosis, this research will lead to efforts to develop new diagnostics. It may also inform efforts to develop new drugs able to selectively kill cells showing the marks of EMT or repress their ability to detach from the primary tumor mass and colonize other sites in the body. **Peter Tarr**

