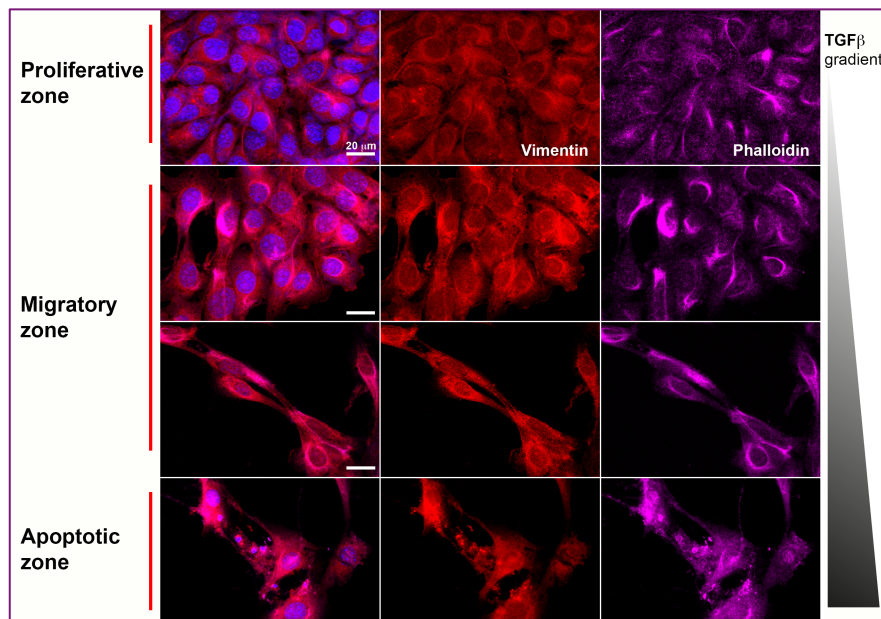


## Change in behavior of breast cancer cells upon exposure to $TGF\beta$ gradient

*Cline Nano Gradients are used here to study how change in concentration of surface-bound  $TGF\beta$  affects cancer cells (NMuMG). Study performed by Petra Sekyrova, PhD, Karolinska Institute Sweden (2015).*



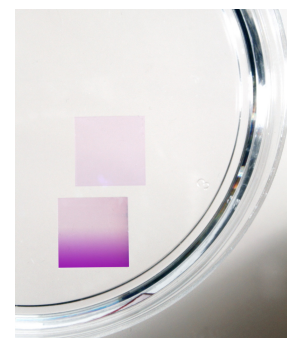
*$TGF\beta$  bound to Cline Nano Gradient (part. # NG06-0109913)  
Low concentration in the upper part of the image.*

### Proliferative zone

In low concentrations of  $TGF\beta$  factor cells retain epithelial morphology and proliferate normally, although they already start to express mesenchymal marker Vimentin. Actin fibers visualized by phalloidin are distributed smoothly within the cells and without apparent direction.

### Migratory zone

With increasing concentrations of  $TGF\beta$  factor cells loosen their contacts and elongate into spindle-like shape, where actin fibers rearrange along the long axis of the cell. This is consistent with a well-known role of  $TGF\beta$  to activate Epithelial-Mesenchymal Transition (EMT) through which cancer cells switch to mesenchymal, motile phenotype. This is a first step of metastasis and cancer dissemination.



*Cline Nano Gradient & Cline Nano Surface*

### Apoptotic zone

At high doses of  $TGF\beta$  factor cells tend to deteriorate and commence apoptosis, another known effect of  $TGF\beta$ .

Cline Nano Gradients visit <http://clinescientific.com/?page=162>