Spatial Analysis of HER2 Expression at Focal Adhesions

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The human epidermal growth factor receptor 2 (HER2), or ErbB2, is overexpressed in a variety of cancer types driving proliferation and survival. Integrins, among other adhesion proteins, enable epithelial cells to adhere to their surrounding tissue and thereby also promote survival signals. We investigated whether HER2 expression is enriched or spatially linked to focal adhesions by transduction of a focal adhesion marker followed by extra- or intracellular labeling of HER2 with nanoparticles on breast cancer cells. Cells were analyzed by brightfield and total internal reflection fluorescence microscopy. We were able to analyze the HER2 expression at the cell/substrate interface only by intracellular labeling but observed no altered HER2 receptor distributions for focal adhesion areas on breast cancer cells. Thus, our established intracellular labeling protocol allows fluorescent analysis of extracellular non-accessible membrane proteins.