Redox mosaic in breast cancer: At the intersection of cancer and adipose tissue

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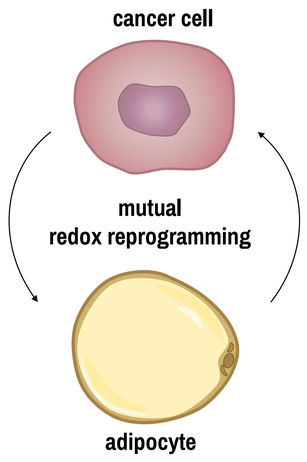
Background information

Altered redox homeostasis is a hallmark of neoplastic transformation.

Breast cancer behaves as a complex *pseudo organ* due to cell heterogeneity within the complex tumor microenvironment.

Bidirectional cross-talk between **cancer cells** and **cancer-associated adipocytes** contributes to breast cancer progression.

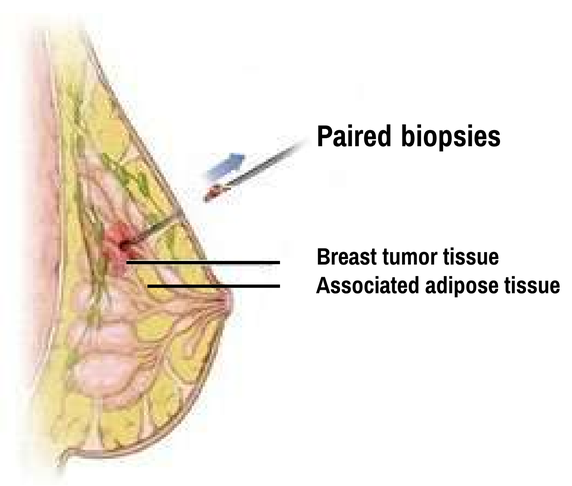


Experimental design

Paired biopsies of tumor and associated adipose tissue were sampled from premenopausal women with **malignant** invasive ductal carcinoma or **benign** fibroadenoma.

To overcome barriers associated with bulk tissue gene and protein expression analysis, an immunohistochemical approach was chosen.

Serial tissue sections of breast tumor and adipose tissue were prepared for immunohistochemistry and light microscopy and cross-examined.

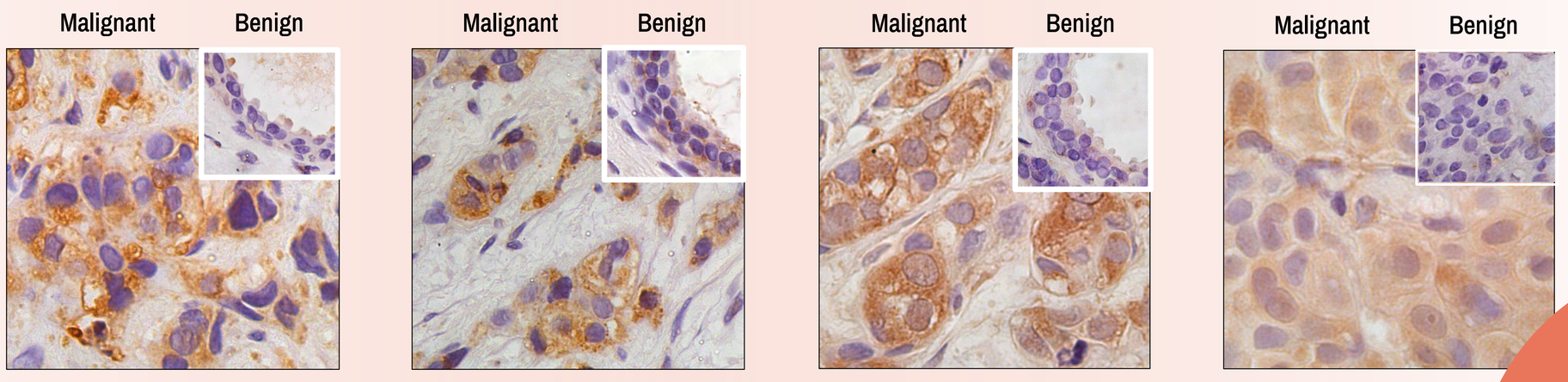


Aim: To gain a comprehensive overview of cell-specific antioxidant defence (**AD**) enzymes expression and localization patterns.

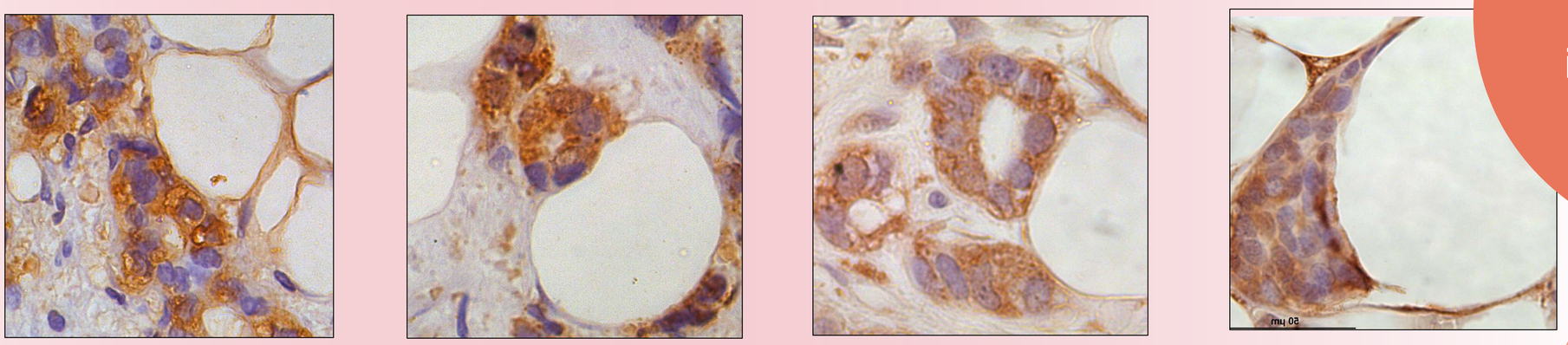
Results

Breast Cancer

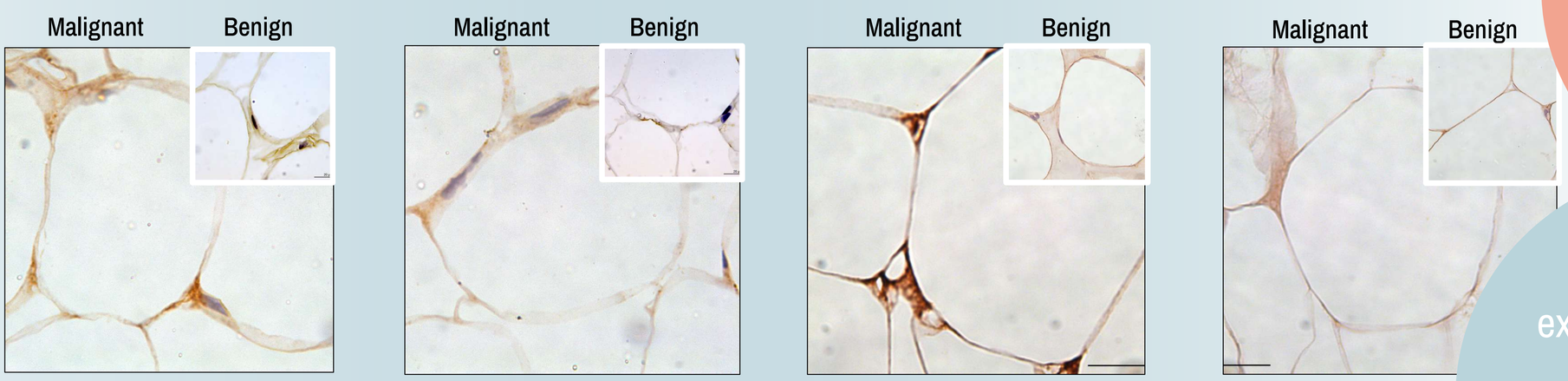
Center of the tumor mass



Invasive front of the tumor



Tumor-associated adipose tissue



copper, zinc superoxide dismutase

manganese superoxide dismutase

catalase

glutathione peroxidase

Conclusions

AD enzymes are highly expressed in malignant tumor tissue.

AD enzymes specifically localize in cancer cells.

Cancer cell-adipocytes clusters are highly immunopositive for AD enzymes.

AD enzymes specifically localize in cancer-associated adipocytes.

AD enzyme expression increases with proximity to cancer cells in cancer-associated adipose tissue.

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