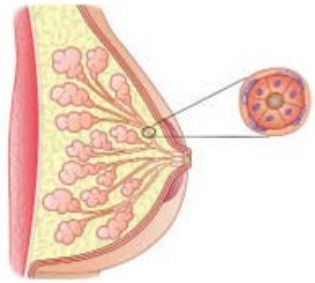
Novel gene rearragements in radiation-transformed breast epithelial cells

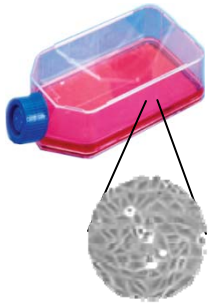
Workflow Array painting

Department of Radiation Cytogentics



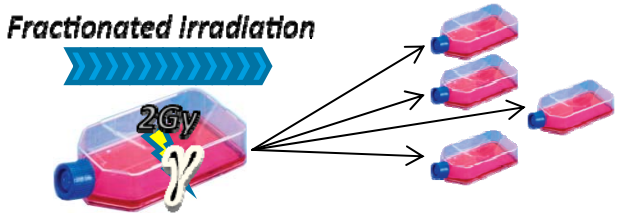
normal
Ductal epithelial breast cells

primary culture



cultivation

immortalized with hTERT

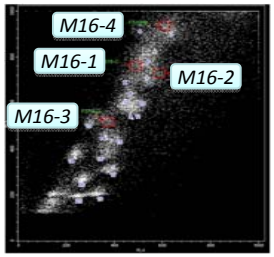


Radiation-transformed HMEC cells
with transformed phenotypes
(anchorage-independent growth, tumours in nude mice

B42-16 B42-11

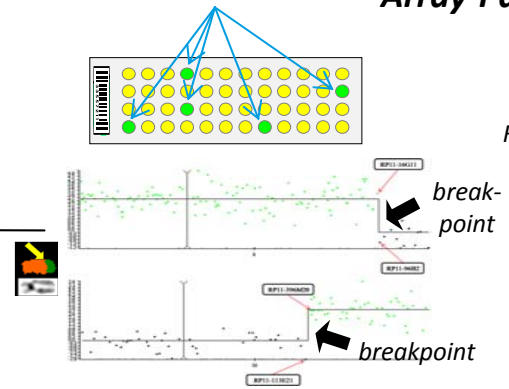
Chromosomal rearrangements

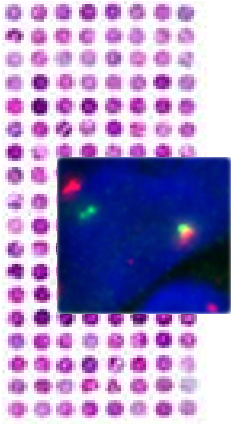
Flow-sorting of marker chromosomes



Breakpoint analysis
in vitro

Array-Painting

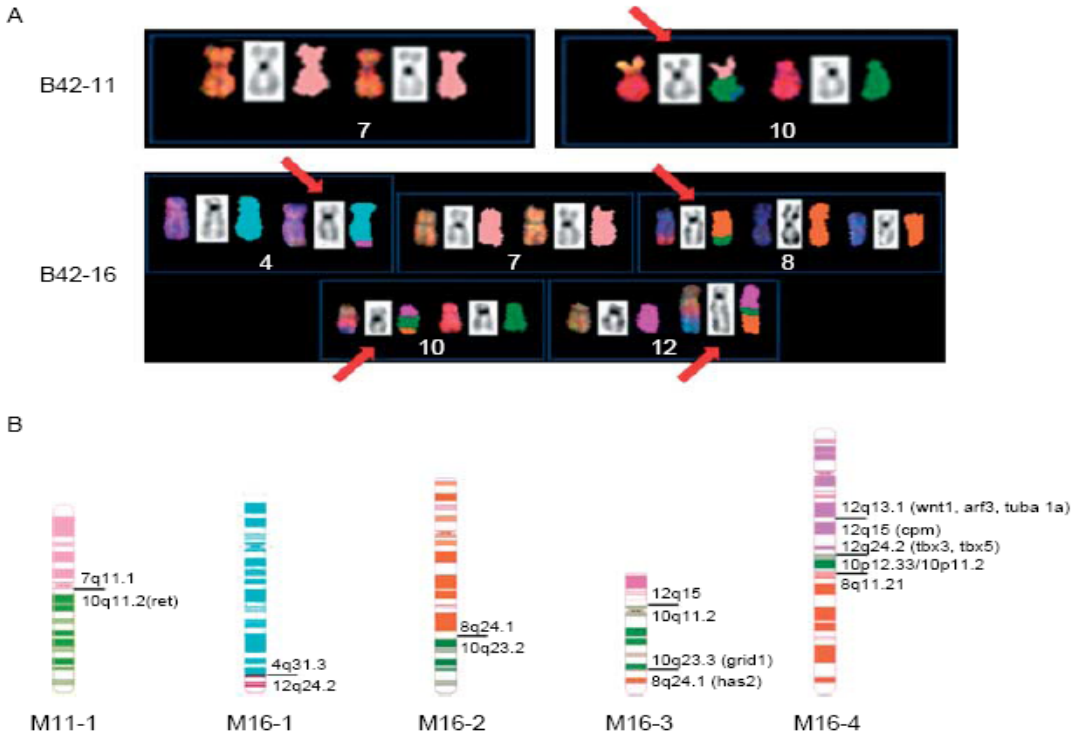




in vivo validation of
in vitro findings

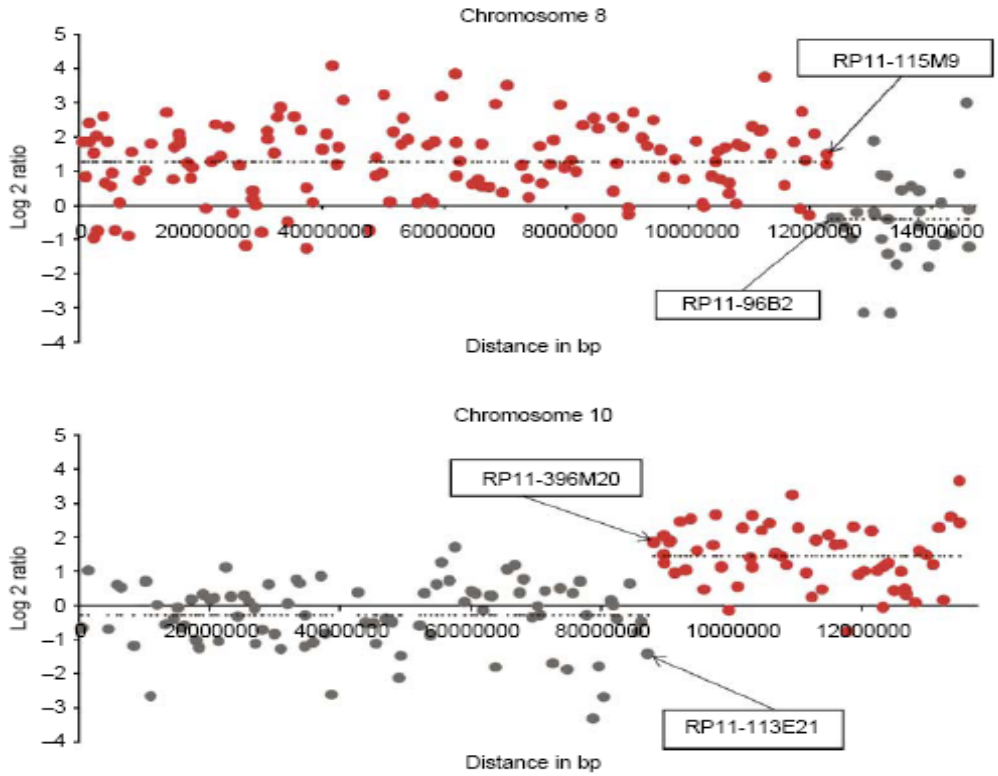
Unger et al., Endocrine-related Cancer, 2009

Identification of rearranged chromosomes in the cell lines B42-11 and B42-16 by Spectral Karyotyping (SKY)



A: marker chromosomes are indicated by red arrows
B: ideograms of the marker chromosomes

Array-painting analysis of marker chromosome M-16-2 (t(8;10)

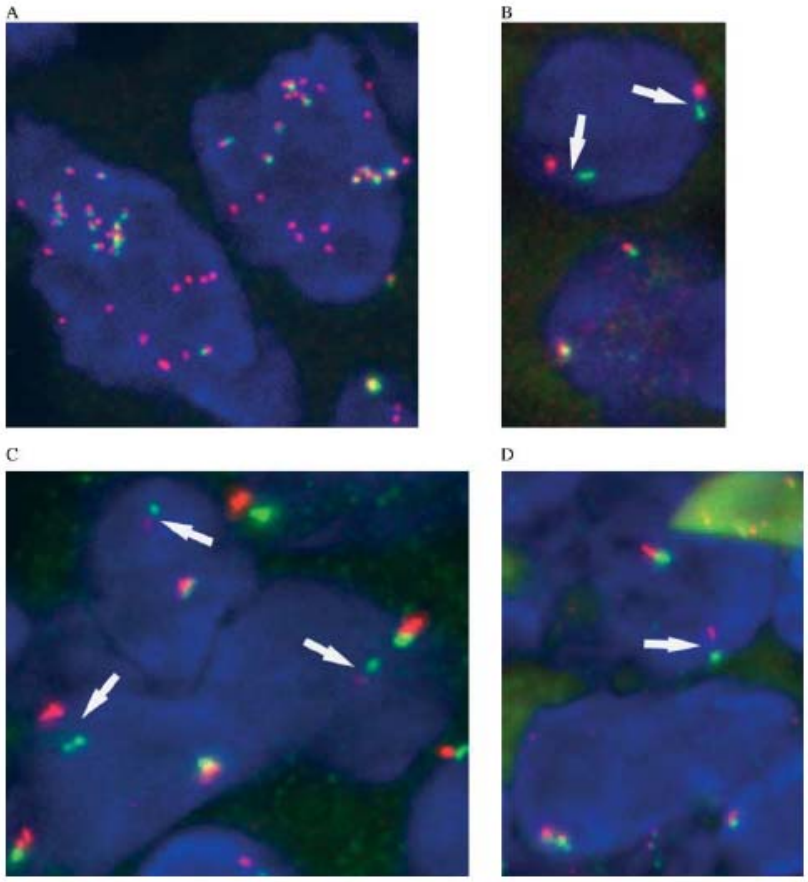


Array profiles indicate hybridisation signals of the marker chromosome (red dots)

Breakpoint flanking BAC clones are indicated by arrows

FISH analysis of a FFPE breast cancer tissue array with breakpoint flanking probes for the genes *Has2*, *Grid1* and *Ret*

Two polyploid cells of a breast cancer specimen with multiple red FISH signals representing a high level amplification of the gene *Has2*.



Two breast cancer cells whereas the upper shows rearrangement of *Has2* (split red and green signals, white arrow) and the lower shows a normal hybridisation pattern (fused signals).

A rearrangement of the gene *Grid1* is demonstrated by split FISH signals (indicated by white arrow) in a breast cancer cell.

Rearrangement of the *Ret* locus is indicated by split FISH signals (white arrow) in a breast cancer cell.