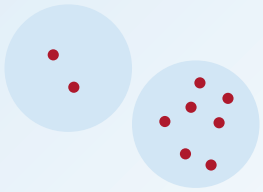
arbor biosciences

myTags® Human Cancer *in situ* Probes

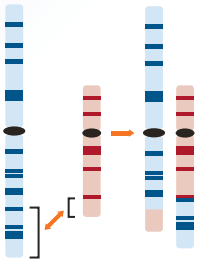
Custom *in situ* hybridization probes to explore human cancers

Cytogenomics plays a critical role in the research and diagnosis of cancer and other genetic anomalies. The application of myTags technology provides the researcher a powerful and customizable analytical tool to explore haematological malignancies and solid tumors. The myTags in situ hybridization (ISH) probes are compatible with a range of applications including interphase ISH, metaphase ISH, cultured cells and FFPE tissue.

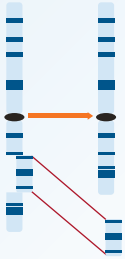
myTags *in situ* probes can be designed to detect various genetic anomalies



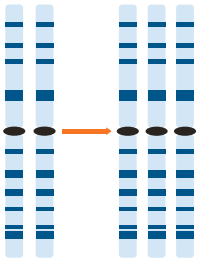
Gene amplifications:
Detects extra copies of specific genes within the nucleus of the cell



Gene translocations:
Detects exchanges of regions between chromosomes



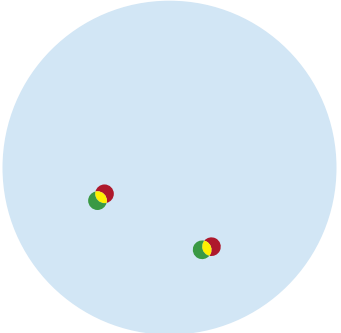
Gene deletions:
Detects missing parts of chromosomes



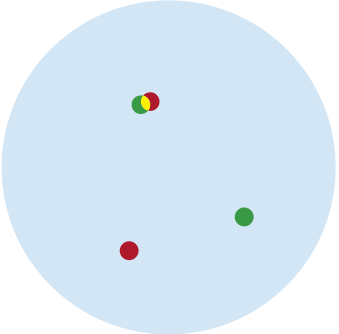
Chromosome aneuploidies:
Detects abnormal numbers of chromosomes

Break-apart *in situ* probes

Break-apart probes complement the localization of translocations that results in gene fusions. This design is especially useful in tissue sections or cultured cells where detection of metaphase chromosomes is not practical. The strategy is to design two different probes that flank the specific gene of interest. One region is fluorescently labeled with one color (red) the other region is labeled with a second color (green) and the region of overlap will appear yellow. In normal tissue the two signals will be localized close together and appear fused. In the case of a translocation or rearrangement the signals will 'break apart' and appear as separate red and green spots.



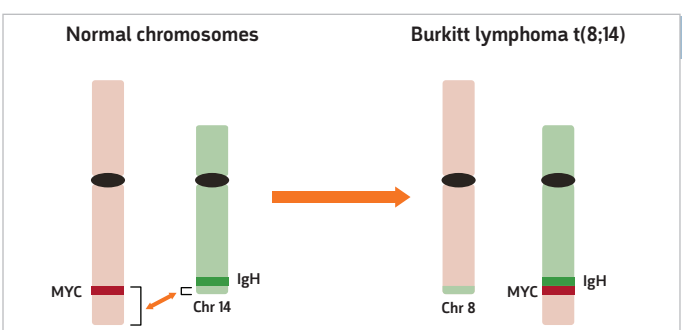
Normal
Signal appears fused



Gene translocation
Break-apart signal

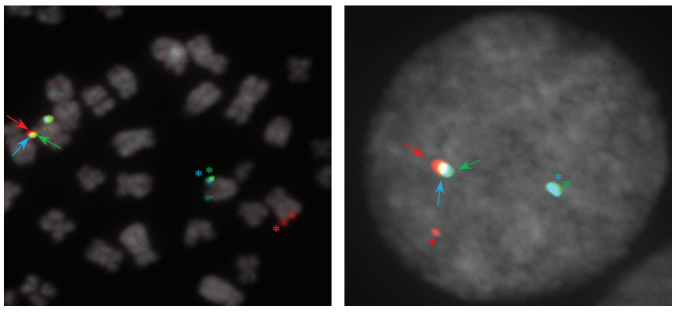
Translocations play a role in hematologic cancers

Burkitt lymphoma (BL) is considered one of the most aggressive form of lymphoma and fastest growing of all cancers. The specific translocation involving the MYC gene is between chromosome 8 and chromosome 14, t(8;14)(q24;q32). The translocation of the MYC gene adjacent to the regulatory elements of the immunoglobulin heavy chain gene on chromosome 14 results in over expression of MYC and the onset of BL.



myTags custom probes in the identification of MYC translocation

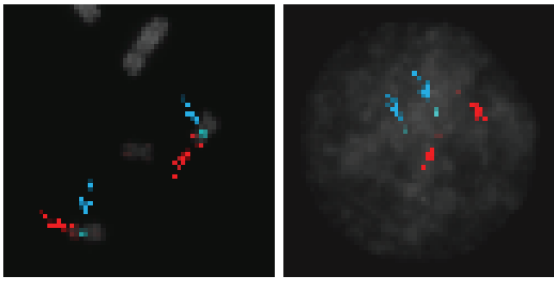
Reliable identification of the translocation t(8:14) is by DNA fluorescent in situ hybridization (FISH) using myTags in situ probes. The three different probes are used and identifying the 5' upstream region (red) and the 3' downstream region (green) flanking the MYC locus (cyan) hybridized to CA-46 cells isolated from a patient with BL and carried the t(8;14) translocation.



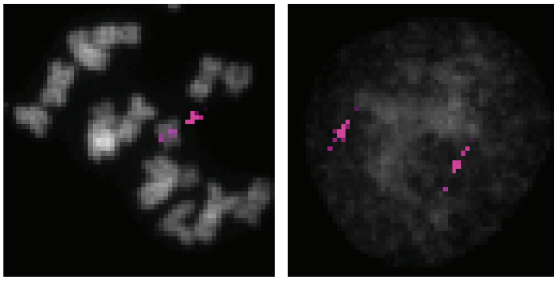
Metaphase chromosomes and interphase nucleus in CA-46 cells are depicted with myTags ISH probes labeling MYC break-apart and the MYC locus. The probes detecting the 5' upstream region are labeled with ATTO 550 (red arrow), the MYC locus labeled with ATTO 647N (cyan arrows) and the 3' downstream region are labeled with Alexa 488 (green arrows). Areas where red and green signals overlap appear yellow. Some areas the signals overlap and obscure the one or more signals. The ** denotes appropriate labeling of the t(8;14) translocation of the MYC locus and the 3' flanking region. The * denotes the 5' flanking region remaining on chromosome 8.

myTags designs localize other genes involved with cancer

myTags probes can be custom designed to localize other cancer targets to meet the specific needs of the research objectives.



The TP53 gene encodes the p53 tumor suppressor protein and is critical for regulation of cell division and maintaining genomic stability. Metaphase chromosomes and interphase nucleus in HT 1080 cells are labeled with myTags in situ probes detecting the TP53 locus labeled with ATTO 550 (red arrow) and chromosome 17 centromeric enumeration myTag probe labeled with ATTO 647N (cyan arrows)



The ERBB2 oncogene encodes the tyrosine kinase receptor HER2 (human epidermal growth factor receptor 2). Mutations in the ERBB2 gene can lead to overexpression contributing disruption in cell growth resulting in cancer. Metaphase chromosomes and interphase nucleus in HT 1080 cells are labeled with myTags in situ probes detecting the ERBB2 gene target labeled with ATTO 647N (magenta arrow).

myTags can customize your cancer research

myTags technology offers high specificity, consistent hybridization performance, and the ability to create unlimited custom designs to meet any needs. Contact our team to learn how myTags can be customized to advance your cancer research.

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