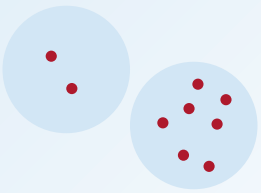
myTags® Human Cancer *in situ* Probes

Custom *in situ* hybridization probes to explore human cancers

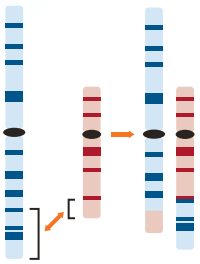
Highly specific and customizable cytogenomic analysis of human cancer

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 hematological malignancies and solid tumors. The myTags *in situ* hybridization (ISH) probes are compatible with a range of applications including interphase and metaphase ISH, cultured cells, and FFPE tissue.

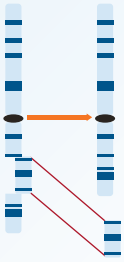
myTags *in situ* probes can be designed to detect various genetic anomalies



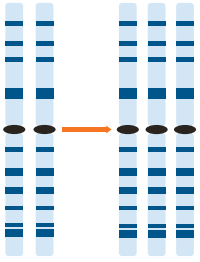
Gene amplifications:
Detecting extra copies of specific genes in the nucleus



Gene translocations:
Detecting exchanged regions between chromosomes



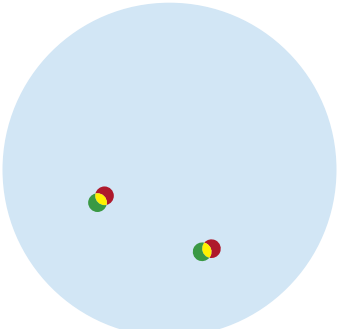
Gene deletions:
Detecting a missing part of the chromosome



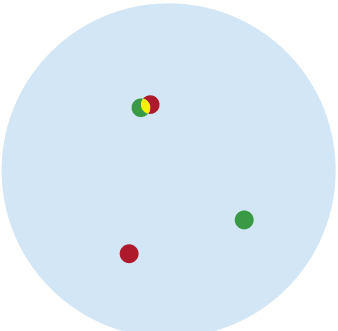
Chromosome aneuploidies:
Detecting abnormal numbers of chromosomes

Break-apart *in situ* probes

Break-Apart probes allow the localization of translocations that result in gene fusions. This design approach is especially useful in tissue samples which are the most common source for detection of translocations. The strategy is to design two different probe sets 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

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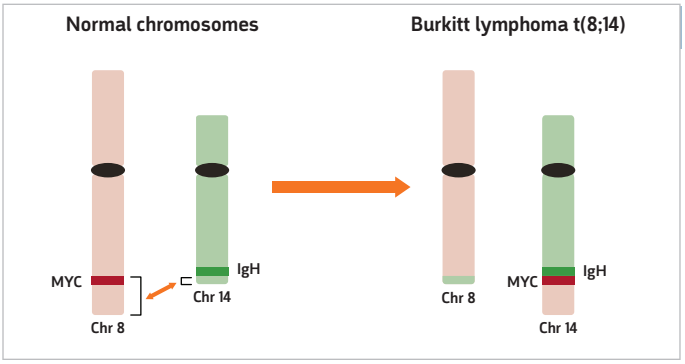
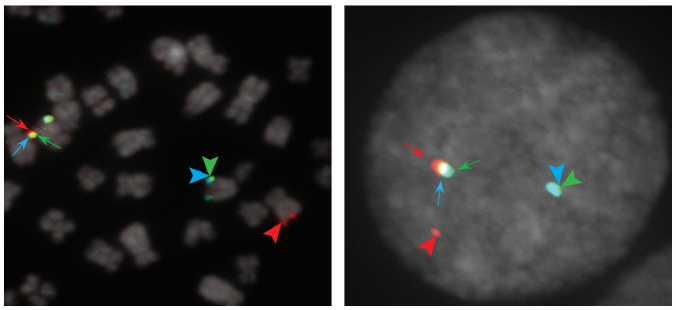
Translocations play a role in hematologic cancers

Burkitt lymphoma (BL) is one of the most aggressive forms of lymphoma and fastest growing of all cancers. The specific translocation in BL involves the MYC gene, occurring 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 identify the MYC translocation in Burkitt Lymphoma

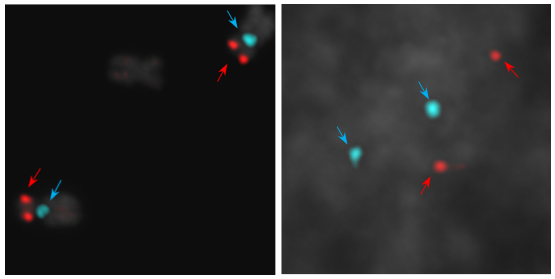
myTags probes hybridizing to genomic DNA can reliably identify the MYC translocation t(8:14) by fluorescent in situ hybridization (FISH). The three different probe sets identify the 5' upstream region (red) and the 3' downstream region (green) flanking the MYC locus (cyan) in CA-46 cells isolated from a patient with BL who carried the t(8;14) translocation.



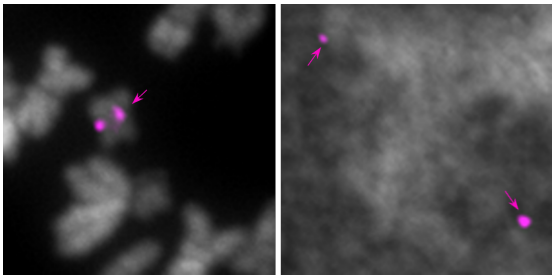
Metaphase chromosomes and interphase nucleus in CA-46 cells are depicted showing fluorescent myTags MYC Break-Apart probes identifying the MYC locus and flanking regions. The 5' upstream region is labeled with ATTO 550 (red arrow), the MYC locus is labeled with ATTO 647N (cyan arrows) and the 3' downstream region is labeled with Alexa 488 (green arrows). Areas where red and green signals overlap appear yellow. Some areas the signals overlap and obscure 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. A translocated and normal MYC locus is observable in both images.

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 your research.



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 myTag chromosome 17 centromeric enumeration 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 and 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 advantages include high specificity (vs BAC), consistent hybridization performance, and unlimited customizable designs for any target. myTags probes arrive labeled and ready to use. Contact our design experts to learn how myTags can be customized to advance your cancer research!

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