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## **Fluorescence *in situ* Hybridization General Principles and Clinical Application with Special Emphasis to Interphase Diagnostics**

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**KEY WORDS** Interphase FISH; mosaic analysis; centromere peculiarities; microdeletion; tumor karyotype.

**ABSTRACT** Fluorescence in situ hybridization (FISH) is a molecular-cytogenetic investigation method and thus covers a gap between classical cytogenetic and molecular-genetic techniques. By the broad spectrum of application possibilities it leads to important new developments in basic and applied cytogenetics. It enables the labeling of whole chromosomes and defined chromosome regions and furthermore gene localization with single copy probes. FISH is a technique that allows DNA sequences to be detected on metaphase chromosomes, in interphase nuclei, in a tissue section, or in blastomeres and gametes. In basic scientific research special fields of application comprise characterization of somatic cell hybrids, analyses of meiosis and of karyotype evolution. In clinical and tumor cytogenetic it helps to identify chromosome rearrangements, marker chromosomes, chromosome mosaicism and specific tumor cell lines. Fluorescence in situ hybridization receives a special importance for interphase cytogenetics, which mainly covers the development in this field.

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