DNA isolation and genetic markers

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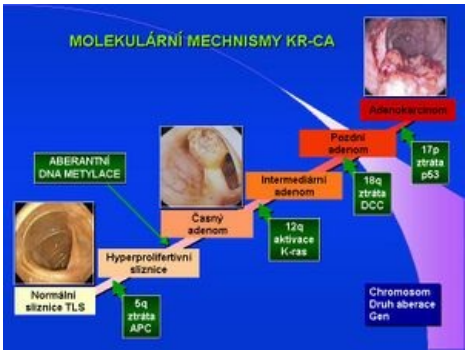
The development of molecular biology and the application of PCR in routine diagnostics are opening up completely new trends in the screening of GIT tumors. The latest screening methods are based on the detection of specific mutations by PCR or biochip technology in DNA isolated from stool samples.

Molecular biology offers the possibility to detect individual genetic markers of the colorectal cancer process in the adenoma-carcinoma sequence: loss/mutation of APC gene at 5q, overexpression of COX-2, activation/mutation of K-ras at 12q, loss/mutation of p53 at 17p, loss of DCC at 18q. The gene mutations can be detected in a biopsy sample of colon tissue or in a stool sample after DNA isolation from colonic mucosal epithelia. Commercially available kits provide isolation of 10-30 µg DNA from a 220 mg stool sample in a 50-minute process and removal of inhibitors for further PCR analysis. Real-time PCR techniques allow, for example, the detection of hypermethylation of the SFRP2 gene in DNA isolated from stool as a marker of colorectal cancer.



Molecular mechanisms KR-CA

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