

Izolace DNA a genetické markery

Rozvoj molekulární biologie a aplikace typu PCR v rutinní diagnostice otevírají zcela nové trendy i ve screeningu tumorů GIT. Nejnovější screeningové metody jsou založeny na detekci specifických mutací metodami PCR nebo biočipovou technologií v DNA izolované ze vzorku stolice.

Molekulární biologie nabízí možnost detekce jednotlivých genetických markerů procesu vzniku kolorektálního karcinomu v sekvenci adenom – karcinom: ztráta/mutace genu APC na 5q, overexprese COX-2, aktivace/mutace K-ras na 12q, ztráta/mutace p53 na 17p, ztráta DCC na 18q. Genové mutace lze detekovat v biotickém vzorku tkáně tlustého střeva nebo ve vzorku stolice po izolaci DNA z epitelů kolonické sliznice. Komerčně nabízené soupravy zajišťují izolaci 10 – 30 µg DNA ze vzorku 220 mg stolice během padesátiminutového procesu a odstranění inhibitorů pro další PCR analytiku. Real-time PCR techniky umožňují např. detekci hypermetylace SFRP2 genu v DNA izolované ze stolice, jako marker kolorektálního karcinomu.

Odkazy

Související články

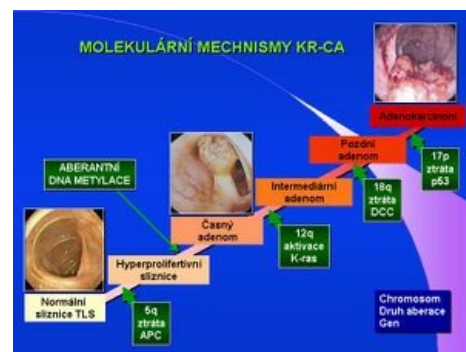
- Screening nádorů tlustého střeva
- Polymerasová řetězová reakce

Zdroj

- se svolením autora převzato z KOCNA, Petr. *GastroLab : MiniEncyklopedie laboratorních metod v gastroenterologii* [online]. ©2002. Poslední revize 2011-01-08, [cit. 2011-03-04]. <<http://www1.lf1.cuni.cz/~kocna/glab/glency1.htm>>.

Reference

- CALISTRI, D, et al. Quantitative fluorescence determination of long-fragment DNA in stool as a marker for the early detection of colorectal cancer. *Cell Oncol.* 2009, vol. 31, no. 1, s. 11-7, ISSN 1570-5870 (Print), 1875-8606 (Electronic). PMID: 19096146 (<https://www.ncbi.nlm.nih.gov/pubmed/19096146>).
- KOGA, Y, et al. Detection of the DNA point mutation of colorectal cancer cells isolated from feces stored under different conditions. *Jpn J Clin Oncol.* 2009, vol. 39, no. 1, s. 62-9, ISSN 0368-2811 (Print), 1465-3621 (Electronic). PMID: 19042945 (<https://www.ncbi.nlm.nih.gov/pubmed/19042945>).
- AHLQUIST, DA, et al. Stool DNA and occult blood testing for screen detection of colorectal neoplasia. *Ann Intern Med.* 2008, vol. 149, no. 7, s. 441-50, ISSN 0003-4819 (Print), 1539-3704 (Electronic). PMID: 18838724 (<https://www.ncbi.nlm.nih.gov/pubmed/18838724>).
- ITZKOWITZ, S, et al. A simplified, noninvasive stool DNA test for colorectal cancer detection. *Am J Gastroenterol.* 2008, vol. 103, no. 11, s. 2862-70, ISSN 0002-9270 (Print), 1572-0241 (Electronic). PMID: 18759824 (<https://www.ncbi.nlm.nih.gov/pubmed/18759824>).
- WANG, DR, et al. Hypermethylated SFRP2 gene in fecal DNA is a high potential biomarker for colorectal cancer noninvasive screening. *World J Gastroenterol.* 2008, vol. 14, no. 4, s. 524-31, ISSN 1007-9327. PMID: 18203283 (<https://www.ncbi.nlm.nih.gov/pubmed/18203283>).
- RENNERT, G, et al. Detecting K-ras mutations in stool from fecal occult blood test cards in multiphasic screening for colorectal cancer. *Cancer Lett.* 2007, vol. 253, no. 2, s. 258-64, ISSN 0304-3835 (Print), 1872-7980 (Electronic). PMID: 17349741 (<https://www.ncbi.nlm.nih.gov/pubmed/17349741>).
- HAUG, U, et al. Mutant-enriched PCR and allele-specific hybridization reaction to detect K-ras mutations in stool DNA: high prevalence in a large sample of older adults. *Clin Chem.* 2007, vol. 53, no. 4, s. 787-90, ISSN : 0009-9147 (Print), 1530-8561 (Electronic). PMID: 17317884 (<https://www.ncbi.nlm.nih.gov/pubmed/17317884>).
- MATSUSHITA, H, et al. A new method for isolating colonocytes from naturally evacuated feces and its clinical application to colorectal cancer diagnosis. *Gastroenterology.* 2005, vol. 129, no. 6, s. 1918-27, ISSN 0016-5085 (Print), 1528-0012 (Electronic). PMID: 16344060 (<https://www.ncbi.nlm.nih.gov/pubmed/16344060>).
- GREENWALD, B. The stool DNA test: an emerging technology in colorectal cancer screening. *Gastroenterol Nurs.* 2005, vol. 28, no. 1, s. 28-32, ISSN 1042-895X (Print), 1538-9766 (Electronic). PMID: 15738729 (<https://www.ncbi.nlm.nih.gov/pubmed/15738729>).
- OUYANG, DL. Noninvasive testing for colorectal cancer: a review. *Am J Gastroenterol.* 2005, vol. 100, no. 6, s. 1393-403, ISSN 0002-9270 (Print), 1572-0241 (Electronic). PMID: 15929776 (<https://www.ncbi.nlm.nih.gov/pubmed/15929776>).



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bmed/15929776).

- WHITNEY, D, et al. Enhanced retrieval of DNA from human fecal samples results in improved performance of colorectal cancer screening test. *J Mol Diagn.* 2004, vol. 6, no. 4, s. 386-95, ISSN 1525-1578 (Print), 1943-7811 (Electronic). PMID: 15507679 (<https://www.ncbi.nlm.nih.gov/pubmed/15507679>).
- IMPERIALE, TF, et al. Fecal DNA versus fecal occult blood for colorectal-cancer screening in an average-risk population. *N Engl J Med.* 2004, vol. 351, no. 26, s. 2704-14, ISSN 0028-4793 (Print), 1533-4406 (Electronic). PMID: 15616205 (<https://www.ncbi.nlm.nih.gov/pubmed/15616205>).
- BRAND, RE, et al. Reproducibility of a multitarget stool-based DNA assay for colorectal cancer detection. *Am J Gastroenterol.* 2004, vol. 99, no. 7, s. 1338-41, ISSN 0002-9270 (Print), 1572-0241 (Electronic). PMID: 15233675 (<https://www.ncbi.nlm.nih.gov/pubmed/15233675>).
- SONG, K, et al. Fecal DNA testing compared with conventional colorectal cancer screening methods: a decision analysis. *Gastroenterology.* 2004, vol. 126, no. 5, s. 1270-9, ISSN 0016-5085 (Print), 1528-0012 (Electronic). PMID: 15131787 (<https://www.ncbi.nlm.nih.gov/pubmed/15131787>).
- LEVIN, B, et al. Emerging technologies in screening for colorectal cancer: CT colonography, immunochemical fecal occult blood tests, and stool screening using molecular markers. *CA Cancers J Clin.* 2003, vol. 53, no. 1, s. 44-55, ISSN 0007-9235 (Print), 1542-4863 (Electronic). PMID: 12568443 (<https://www.ncbi.nlm.nih.gov/pubmed/12568443>).
- NISHIKAWA, T, et al. A simple method of detecting K-ras point mutations in stool samples for colorectal cancer screening using one-step polymerase chain reaction/restriction fragment length polymorphism analysis. *Clin Chim Acta.* 2002, vol. 318, no. 1-2, s. 107-12, ISSN 0009-8981 (Print), 1873-3492 (Electronic). PMID: 11880119 (<https://www.ncbi.nlm.nih.gov/pubmed/11880119>).
- PRIX, L, et al. Diagnostic biochip array for fast and sensitive detection of K-ras mutations in stool. *Clin Chem.* 2002, vol. 43, no. 3, s. 428-35, ISSN 0009-9147 (Print), 1530-8561 (Electronic). PMID: 11861435 (<https://www.ncbi.nlm.nih.gov/pubmed/11861435>).