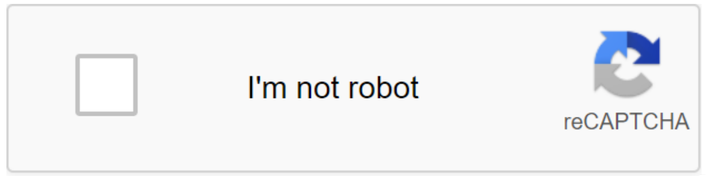

Continue

Dna based diagnosis of genetic diseases pdf

A specialist using the ziasimphony, an automation platform for molecular diagnostic tests, Molecular Diagnostics is a set of methods used to analyze biological markers in the genome and proteome - the human genetic code and how their cells express their genes as proteins, applying molecular biology to medical testing. The technique is used to diagnose and monitor diseases, identify risk and decide which treatments will work best for individual patients. Analyzing the specifics of the patient and his illness, molecular diagnosis opens up the prospects of personalized medicine. These tests are useful in a number of medical specialties, including infectious diseases, oncology, human typing of the human white blood cell antigen (which investigates and predicts immune function), coagulation and pharmacogenomics - genetic prediction of which drugs will work best. They overlap with clinical chemistry (medical tests on bodily fluids). History Molecular Diagnostics uses techniques such as mass spectrometry and gene chips to capture the expression of genes and proteins The field of molecular biology grew in the late twentieth century, as did its clinical application. In 1980, Yuet Wai Kan et al. proposed a prenatal genetic test for thalassaemia, which relied not on DNA sequencing, but on infancy, but on enzyme limitations that cut out DNA, where they recognized specific short sequences, creating different lengths of strand DNA depending on what allele (genetic variation) the fruit possessed. In the 1980s, the phrase was used in the names of companies such as Molecular Diagnostics Incorporated and Bethseda Research Laborates Molecular Diagnostics. In the 1990s, the identification of newly discovered genes and new DNA sequencing techniques led to a separate area of molecular and genomic laboratory medicine; in 1995, the Association of Molecular Pathology (AMP) was established to give it a structure. In 1999, AMP co-founded the Journal of Medical Diagnostics. In 2001, Informa Healthcare launched expert reviews in the field of medical diagnostics. Since 2002, the HapMap project has been aggregating information about single-forward genetic differences that are repeated in the human population - the only nucleotide polymorphism - and their links to the disease. In 2012, molecular diagnostic techniques of thalassaemia used genetic hybridization tests to identify specific single-aderous polymorphism that causes human disease. As the commercial application of molecular diagnostics becomes increasingly important, the debate on patenting genetic discovery is at the heart of the debate. In 1998, the European Union Directive 98/44/ECclarified that patents DNA sequences are valid. In 2010, in the United States, AMP sued Myriad Genetics to challenge the latter's patents against genes, BRCA1, BRCA2, which are associated with breast cancer. In 2013, the U.S. Supreme Court partially agreed with the decision that a naturally occurring gene sequence could not be patented. The methods of Affymetrix 5.0, a micro-array development chip from the research tools Industrialization of Molecular Biology tools have made it practical for their use in clinics. Miniaturization in a single portable device can bring medical diagnostics to the clinic and to the office or home. The clinical laboratory requires high standards of reliability; diagnosis may require accreditation or be subject to medical device rules. As of 2011, some U.S. clinical laboratories used tests sold for research only. Laboratory processes must comply with regulations such as the Clinical Laboratory Improvement Amendment, the Health Insurance Portability and Accountability Act, the Medical Laboratory Practice, and the specifications of the Food and Drug Administration in the United States. Information management lab systems help track these processes. The regulation applies to both staff and consumables. As of 2012, twelve U.S. states require the license of molecular pathologists; several boards such as the American Council of Medical Genetics and the American Pathology Council certify technologists, lab managers and directors. Automation and barcoding of samples maximize bandwidth and reduce the likelihood of error or contamination in manual processing and reporting of results. Individual devices for analysis from start to finish are now available. Analysis of the main articles: Analysis and biological analysis Of Molecular Diagnostics uses in vitro biological analyses such as PCR-ELISA or Fluorescence at the hybridization site. The analysis detects a molecule, often in low concentrations, that is a marker of disease or risk in a sample taken from the patient. Keeping the sample before analysis is crucial. Manual processing should be kept to a minimum. Fragile RNA molecule creates certain problems. As part of the cellular process of gene expression in the form of proteins, it offers a measure of gene expression, but it is vulnerable to hydrolysis and the breakdown of the constantly present enzymes of RANA. Samples can be frozen in liquid nitrogen or incubated in conservation agents. (h 39) Because molecular diagnostic techniques can detect sensitive markers, these tests are less intrusive than traditional biopsies. For example, since there are non-cell nucleic acids in human plasma, a simple blood sample may be sufficient to give genetic information

from tumors, transplants or future fetuses. Many but not all molecular diagnostic methods based on the detection of nucleic acids use polymerase chain reaction (PCR) to significantly increase the number of nucleic acid molecules, thereby strengthening the target sequence (s) in the Sample. PCR is a method that the DNA pattern is enhanced by synthetic primer, DNA polymerase, and dNTPs. The mixture cycled between at least 2 temperatures: a high temperature for the denaturation of double strands of DNA in single-jet molecules and low temperature for primer to hybridize the pattern and for polymerase to extend the primer. Each temperature cycle theoretically doubles the amount of target sequence. Detection of sequence variations using PCR usually involves the design and use of oligonucleotide reagents, which enhance the variant of interest more effectively than the sequence of wild type. PCR is now the most widely used method for detecting DNA sequences. The marker detection can be used by PCR in real time, direct sequencing, (ch 17) , micro-array chips - prefabricated chips that check many markers at the same time, (ch 24) or MALDI-TOF, the same principle applies to the proteum and genome. High-speed protein arrays can use additional DNA or antibodies to bind and therefore can detect many different proteins in parallel. Molecular diagnostic tests vary greatly in sensitivity, time, cost, scope and regulatory approval. They also vary in the level of verification used in the laboratories that use them. Thus, a robust local check-up is needed in accordance with regulatory requirements and the use of appropriate controls, especially where the result can be used to inform the patient treatment decision. The micro-array chip application contains additional DNA (cDNA) for many sequences of interest. CDNA fluoresce when it is hybridized with a corresponding DNA fragment in the sample. Prenatal See also: Category:Tests during pregnancy. Conventional prenatal tests for chromosomal abnormalities, such as Down syndrome, rely on analysis of the number and appearance of chromosomes - karyotype. Molecular diagnostic tests, such as micro-array comparative genomic hybridization dna sample testing, and because of cell-free DNA in plasma, may be less invasive, but according to 2013 data it is still an addition to conventional tests. Main treatment article: Pharmacogenomics Some of the only nucleotide polymorphisms of a patient - small differences in their DNA - can help predict how quickly they will metabolize specific drugs; it's called pharmacogenomics. For example, the enzyme CYP2C19 is absorbed by several drugs, such as the anti-clotting agent Clopidogrel, into their active forms. Some patients have polymorphisms in certain places on the 2C19 gene that make bad metabolizers of these drugs; Doctors can check for these and find out if the drugs will be fully effective for this patient. Advances in molecular biology have helped show that some syndromes that were previously classified as a single disease are actually multiple subtypes with fully causes and treatments. Molecular diagnostics can help diagnose subtypes such as infection and cancer, or genetic analysis of a disease with a hereditary component such as Silver-Russell syndrome. Infectious Diseases See also: Pathogenomics Molecular Diagnostics is used to detect infectious diseases such as chlamydia, influenza virus and tuberculosis; or specific strains such as the H1N1 virus. Genetic identification can be rapid; for example, a loop-ined isothermal amplification diagnoses the malaria parasite and is strong enough for developing countries. But despite these advances in genome analysis, infections are still more commonly identified by other means in 2013 - their proteome, bacteriophage or chromatographic profile. Molecular diagnostics are also used to understand a specific strain of the pathogen, for example, by identifying which genes of drug resistance it possesses, and therefore which treatments should be avoided. Disease Risk Management See also: Screening (medication) and genetic testing of the patient's genome may include an inherited or accidental mutation that affects the likelihood of developing the disease in the future. For example, Lynch syndrome is a genetic disease that predisposes patients to colorectal and other cancers; Early detection can lead to close monitoring, which increases the patient's chances of a good outcome. Cardiovascular risk is indicated by biological markers, and screening can measure the risk that a child will be born with a genetic condition such as cystic fibrosis. Genetic testing is ethically complex: patients may not want stress knowing their risk. In countries where there is no universal health care, a known risk can increase premiums. Cancer See also: Cancer cancer metaboloma cancer changes in cellular processes that cause the tumor to grow out of control. Cancer cells sometimes have mutations in oncogenes such as KRAS and CTNNB1 (K-catenin). Analysis of the molecular signature of cancer cells - DNA and its levels of expression using RNA messenger - allows doctors to characterize cancer and choose the best therapy for their patients. By 2010, the analyses, which include many antibodies against specific protein marker molecules, are a new technology; There are hopes for these multiplex analyses that could measure many markers at once. Other potential future biomarkers include microRNS molecules, which cancer cells express more than healthy ones. Cancer is a disease with excessive molecular causes and constant evolution. There's also the heterogeneity of the disease even in humans. Molecular studies of cancer have proven the importance of driver mutations in tumor growth and metastases. Many technologies for detection sequences have been developed for cancer cancer These technologies can usually be grouped into three approaches: polymerase chain reaction (PCR), hybridization and next-generation sequencing (NGS). Currently, many PCR and hybridization tests have been approved by the FDA as an in vitro diagnosis. However, NGS tests are still in the early stages of clinical diagnosis. To make a molecular diagnostic test for cancer, one of the important problems is the detection of variations in DNA sequence. Tumor biopsy samples used for diagnosis always contain only 5% of the target variant compared to the wild-type sequence. In addition, for non-invasive applications from peripheral blood or urine, the DNA test should be specific enough to detect mutations on the allele frequency variant of less than 0.1%. Currently, by optimizing traditional PCR, there is a new invention, the fire-resistant mutation system (ARMS) is a method for detecting VARIANTs of DNA sequence in cancer. Arms principle is that the enzymatic activity of dna polymerase enlargement is very sensitive to inconsistencies near the 3rd end of the primer. Many companies have developed diagnostic tests based on ARMS PCR primers. For example, Iagen therascreen, Roche cobas and Biomerieux THxID have developed FDA-approved PCR tests to detect lung, colon and metastatic melanoma mutations in the KRAS, EGFR and BRAF genes. Their IVD kits were mostly tested on genomic DNA extracted from FFPE tissue. There's also microarrays that use the hybridization mechanism to diagnose cancer. More than a million different probes can be synthesized on an array with Affymetrix's Genechip technology, with a detection limit of one to ten copies of mRNA per well. Optimized micro-arrays are generally considered to be a repeatable relative quantifying of different targets. Currently, the FDA has already approved a number of diagnostic tests using micro-array: Agendia's MammaPrint analyses can report the risk of breast cancer recurrence by profiling the expression of 70 genes associated with breast cancer; The analysis of ingetomics INFNITI CYP2C19 can profiling genetic polymorphisms, the effect of which on the therapeutic response to antidepressants is great; Affymetrix's CytoScan Dx can assess intellectual impairment and congenital disorders by analyzing chromosomal mutations. In the future, cancer diagnostic tools are likely to focus on next-generation sequencing (NGS). Using DNA and RNA sequencing to diagnose cancer, molecular diagnostic technologies will develop better. Although the bandwidth and price of NGS have dropped dramatically over the past 10 years by about 100 times, we are still at least 6 orders more from performing deep sequencing on the whole Genome. Ion Torrent has now developed several ngS-based panels AmpliSeq, for example, Oncomine Comprehensive Analysis. They focus on using deep sequencing of cancer-related genes to detect rare sequence variants. The molecular diagnostic tool can be used to assess cancer risk. For example, a BRCA1/2 test from Myriad Genetics rates women at lifetime risk of breast cancer. In addition, some cancers are not always used with obvious symptoms. It is useful to analyze people when they do not show obvious symptoms and thus can detect cancer at an early stage. For example, the ColoGuard test can be used to test people over 55 years of age for colorectal cancer. Cancer is a long-standing disease with various progression steps, molecular diagnostic tools can be used to predict the progression of cancer. For example, The OncoType Dx test from Genomic Health may assess the risk of breast cancer. Their technology can inform patients to seek chemotherapy when needed by studying levels of RNA expression in breast cancer biopsy tissue. With increased government support for molecular DNA diagnostics, an increasing number of DNA dna tests for cancer are expected to emerge soon. Currently, research into cancer diagnostics is developing rapidly with goals to reduce cost, less consumption time and simpler methods for doctors and patients. See also The Biology Portal Technology Portal Medicine Portal Molecular Medicine (wider field of molecular understanding of the disease) Molecular Pathology Laboratory developed pathogenesis test pathogenomics Pathology Precision Medicine Personalized Medicine Links - b c Poste G (May 2001). Molecular Diagnostics: A powerful new component of the health value chain. Expert review of molecular diagnostics. 1 (1): 1–5. doi:10.1586/14737159.1.1.1. PMID 11901792. a b c d e f g h i Burtis CA, Ashwood ER, Bruns DE (2012). Link's clinical chemistry and molecular diagnostics textbook. Elsevier. ISBN 978-1-4557-5942-2. Hamburg AM, Collins FS (July 2010). The path to personalized medicine. New England Journal of Medicine. 363 (4): 301–4. doi:10.1056/NEJMp1006304. PMID 20551152. Grody WW, Nakamura RM, Strom CM, Kiechle, Frederick L. (2010). Molecular Diagnostics: Methods and Applications for Clinical Laboratory. Boston MA: Academic Press Inc. ISBN 978-0-12-369428-7. Kang YW, Lee KY, Furbetta M, Angius A, Cao A (January 1980). The polymorphism of DNA sequencing in the beta-globin gene area. Application to prenatal diagnosis of beta-0 thalassemia in Sardinia. New England Journal of Medicine. 302 (4): 185–8. doi:10.1056/NEJM198001243020401. PMID 6927915. Con DV, Elting JJ, Frick M, Elde R (June 1984). Selective localization of parathyroid secretory protein I/adrenal medulla chromogranin A protein genus in spectrum of rat's endocrine cells. Endocrinology. 114 (6): 1963–74. 1963–74. PMID 6233131. Desselin JE, Stevens RH (August 1985). Anti-Fab antibodies in the human body. The predominance of mild immunoglobulin G subclass in rheumatoid arthritis. In the Journal of Clinical Research. 76 (2): 723–30. doi:10.1172/JCI112027. PMC 423887. PMID 3928684. Kaplan G, Gaudernack G (October 1982). In vitro differentiation of human monocytes. Differences in monocyte phenotypes caused by cultivation on glass or collagen. In the Journal of Experimental Medicine. 156 (4): 1101–14. doi:10.1084/jem.156.4.1101. PMC 2186821. PMID 6961188. Fausto N, Kaul KL (1999). Presentation of the journal Molecular Diagnostics. In the journal Molecular Diagnostics. 1 (1): 1. doi:10.1016/S1525-1578(10)60601-0. PMC 1906886. Atanasovskaya B., Bozhenovsky G, Chakalova L,Kocheva S,Karanfil O., Placeska-Karanfiska D (December 2012). Molecular diagnosis of Thalassemia. Balkan Journal of Medical Genetics. 15 (Supple): 61-5. doi:10.2478/v10034-012-0021-z. PMC 3776673. PMID 24052746. Sharples A (March 23, 2011). Gene patents in Europe are relatively stable, despite the uncertainty in the UNITED States. Genetic Engineering and Biotechnology News. Received on June 13, 2013. Bravin J., Kendall B (June 13, 2013). Judges strike Down Gene patents. Wall Street Journal. Received on June 15, 2013. Barnes R, Brady D (June 13, 2013). The Supreme Court has ruled that human genes cannot be patented. The Washington Post. Received on June 15, 2013. b Gibbs JN (August 1, 2008). Regulatory pathways for molecular diagnostics. Detailing the different options available and what everyone requires. 24 (14). Genetic Engineering and Biotechnology News. Received on September 4, 2013. The magazine requires magazine (help) - Gibbs JN (April 1, 2011). Uncertainty persists with the products of the ROO. The FDA may consider a more restrictive approach using research-only analyses. 31 (7). Genetic Engineering and Biotechnology News. Received on September 4, 2013. Tomiello K (February 21, 2007) requires the magazine to quote the magazine. Regulatory compliance is driven by LIMS. The world of design. Received on November 7, 2012. Mackinnon AC, Van YL, Sahota A, Yeung CC, Weck KE (November 2012). Certification in Molecular Pathology in the United States: Update from the Association of Molecular Pathology Training and Education Committee. In the journal Molecular Diagnostics. 14 (6): 541–9. doi:10.1016/j.jmoldx.2012.05.004. PMID 22925695. Juluri R. Rao; Colin Craig Fleming; Moore, John E. (July 7, 2006). Molecular Diagnostics: Modern Technologies and Applications (Horizon Bioscience). page 97. ISBN 978-1-904933-19-9. Van Ommen GJ, Breuning MH, Raap AK (June 1995). FISH in genome research and molecular diagnostics. Current opinion in the field of genetics and development. 5 (3): 304–8. doi:10.1016/0959-437X(95)80043-3. PMID 7549423. JA (2012). Review of medical errors in laboratory diagnostics and where we are today. Today. Medicine. 43 (2): 41–44. doi:10.1309/LM6ER9WJR1IH-AUY. a b c d e f Khodakov D, Wang C, Chang DY (October 2016). Diagnosis based on profiling of nucleic acid sequence variants: approaches to PCR, hybridization and NGS. Extended drug delivery reviews. 105 (pt A): 3-19. doi:10.1016/j.addr.2016.04.005. PMID 27089811. Walter Gdoi.org/10.1371/journal.pone.0100566, Busov K, Lukeng A, Gluckler J (June 2002). High-speed protein arrays: the prospects of molecular diagnostics. Trends in molecular medicine. 8 (6): 250–3. doi:10.1016/S1471-4914(02)02352-3. PMID 12067604. Sherwood JL, Brown H, Rettino A, Shreyek A, Clark G, Klas B, Agrawal B, Chaston R, Kong BS, Choppa P, Nygren AO, Deras IL, Kohlmann A (September 1, 2017). Key differences between the 13 KRAS mutation detection technologies and their relevance to clinical practice. ESMO Open. 2 (4): e000235. doi:10.1136/esmoopen-2017-000235. PMC 5623342. PMID 29018576. Advances in prenatal molecular diagnostics conference (Introduction). HealthTech. 2013 Received September 28, 2013 b c d Molecular Diagnostics - National Cancer Institute. Cancer.gov on January 28, 2005. Received on September 26, 2013. Desta S., Xiao X, Shin JG, Flockhart DA (2002). Clinical value of cytochrome P450 2C19 genetic polymorphism. Clinical pharmacokinetics. 41 (12): 913–58. doi:10.2165/00003088-200241120-00002. PMID 12222994. Eggermann T, Spengler S, Gogiel M, Begemann M, Elbracht M (June 2012). Epigenetic and genetic diagnosis of Silver Russell syndrome. Expert review of molecular diagnostics. 12 (5): 459–71. doi:10.1586/erm.12.43. PMID 22702363. Tong CY, Mallinson H (May 2002). The transition to the detection of genital chlamydia trachomatis based on nucleic acid. Expert review of molecular diagnostics. 2 (3): 257–66. doi:10.1586/14737159.2.3.257. PMID 12050864. - Deyde VM, Sampath R, Gubareva LV (January 2011). THE ionization of RT-PCR/electrospray in the detection and characterization of influenza viruses. Expert review of molecular diagnostics. 11 (1): 41–52. doi:10.1586/erm.10.107. PMID 21171920. Pai M, Kalantree S, Dheda K (May 2006). New tools and new TB diagnostic technologies: Part I. Hidden Tuberculosis (PDF). Expert review of molecular diagnostics. 6 (3): 413–22. doi:10.1586/14737159.6.3.413. PMID 16706743. Burcardt HJ (January 2011). Pandemic H1N1 2009 ('swine flu'): diagnostic and other problems. Expert review of molecular diagnostics. 11 (1): 35–40. doi:10.1586/erm.10.102. PMID 21171919. Khan ET (March 2013). The indirectly looped isothermal amplification of the test for molecular malaria diagnosis. Expert review of molecular diagnostics. 13 (2): 205–18. doi:10.1586/erm.12.144. PMID 23477559. b Tang YW, Procop GW, Persing DH (November 1997). Molecular diagnosis of infectious diseases. Chemistry. 43 43 2021–38. doi:10.1093/clinchem/43.11.2021. PMID 9365385. Van Lier MG, Wagner A, Van Lyrdam ME, Biermann K, Kuipers EJ, Steyerberg EW, Dubbink HJ, Dinjens WN (January 2010). Review of the molecular diagnosis of Lynch syndrome: a central role for the pathology laboratory. In the journal Cell and Molecular Medicine. 14 (1–2): 181–97. doi:10.1111/j.1582-4934.2009.00977.x. PMC 3837620. PMID 19929944. - Shrimpton A.E. (May 2002). Molecular diagnosis of cystic fibrosis. Expert review of molecular diagnostics. 2 (3): 240–56. doi:10.1586/14737159.2.3.240. PMID 12050863. - Atorno R (October 2004). The right not to know: an approach based on autonomy. In the Journal of Medical Ethics. 30 (5): 435-9, discussion 439-40. doi:10.1136/jme.2002.001578. PMC 1733927. PMID 15467071. Harmon, Amy (2008-02-24) Insurance fears lead many to shun DNA tests. New York Times - Minamoto T, Ugolkov A.V., May M (November 2002). Detection of oncogenes in the diagnosis of cancer with active oncogenic signaling. Expert review of molecular diagnostics. 2 (6): 565–75. doi:10.1586/14737159.2.6.565. PMID 12465453. Brennan DJ, O'Connor DP, Rexhepaj E, Ponten F, Gallagher WM (September 2010). Antibody-based proteomics: rapid molecular diagnosis in oncology. Nature reviews. Cancer. 10 (9): 605–17. doi:10.1038/nrc2902. PMID 20720569. Ferracin M, Veronese A, Negrini M (April 2010). Micromarkers: MIRNS in cancer diagnosis and prognosis. Expert review of molecular diagnostics. 10 (3): 297–308. doi:10.1586/erm.10.11. PMID 20370587. Misale S, Jager R, Hobor S, Scala E, Janakiraman M, Liska D, Valtorta E, Schiavo R, Buscarino M, Siravegna G, Bencardino K, Cercek A, CT, Veronese S, S, Satorone-Bianchi A, Gambacorta M, Gallicchio M, Vakiani E, Boscaro V, Medico E, Weiser M, Siena S, Di Nicolantonio F, Solit D. Nature. 486 (7404): 532–6. Bibkod:2012Natur.486. 532M. doi:10.1038/nature11156. PMC 3927413. PMID 22722830. Emmadi R, Boonyaratanakornkit JB, Selvarangan R, Shyamala V, zimmer BL, Williams L, Bryant B, Schutzbank T, Schoonmaker MM, Amos Wilson JA, Hall L, Pancholi P, Bernard K (November 2011). Molecular methods and platforms for testing infectious diseases review FDA approved and cleaned analyses. In the journal Molecular Diagnostics. 13 (6): 583–604. doi:10.1016/j.jmoldx.2011.05.011. PMC 3194051. PMID 21871973. The NEXT-generation FDA-approved sequencing system could expand clinical genomic trials: experts predict that the MiSeqDx platform will make genetic testing more accessible to smaller laboratories. Am. J.Med. Genet. A 164, X-XI. Angulo B, Conde E, Suarez-Gotye A, Plaza C, Martinez R, Redondo P, Izquierdo E, Rubio-Vickeira B, Pas Ares L, Hidalgo M, Lopez-Rios F (August 27, 2012). Comparison Methods for testing EGFR mutations in lung carcinoma: direct sequencing, real-time PCR and immunohystochemistry. OOP 1. 7 (8): e43842. Bibkod:2012PLoSO... 743842A. doi:10.1371/journal.pone.0043842. PMC 3428292. PMID 22952784. Gonzalez de Castro D, Angulo B, Gomez B, Mair D, Martinez R, Suarez-Gentie A, Shieh F, Velez M, Brophy VH, Lawrence HJ, Lopez-Rios F (July 2012). Comparison of three methods of detecting KRAS mutations in formalin-fixed colorectal cancer samples. British Cancer Journal. 107 (2): 345–51. doi:10.1038/bjc.2012.259. PMC 3394984. PMID 22713664. Marchand J, Menge A, Larrieux M, Costes V, Solassol J (July 2014). A comparative assessment of the new FDA-approved THxID™-BRAF test with high-resolution melting and sequencing sanger. BMC Cancer. 14: 519. doi:10.1186/1471-2407-14-519. PMC 4223712. PMID 25037456. Salazar R, Roepman P, Capella G, Moreno V, Simon I, Dreezen C, Lopez-Doriga A, Santos C, Marijnen C, Westerga J, Bruin S, Kerr D, Kuppen P, van de Velde C, Morro H, Van Velthuysen L, Glas AM, Van't Veer LJ, Tolenaar R (January 2011). Gene expression signature to improve the prognosis of the prognosis of stage II and Stage III colorectal cancer. In the Journal of Clinical Oncology. 29 (1): 17–24. doi:10.1200/JCO.2010.30.1077. PMID 21098318. Wittner BS, Sgroi DC, Ryan PD, Bruinsma TJ, Glas AM, Men's A, Dahia S, Habin K, Bernards R, Haber DA, Van't Veer LJ, Ramaswamy S (May 2008). Analysis of MammaPrint breast cancer analysis in the predominantly postmenopausal cohort. Clinical cancer research. 14 (10): 2988–93. doi:10.1158/1078-0432.CCR-07-4723. PMC 3089800. PMID 18483364. Lee CC, McMillin GA, Babich N, Melis R, Yeo KT (May 2011). The CYP2C19 genotype panel rating on the GenMark eSensor platform® and comparison with the Autogenomics Infiniti™ and Luminex CYP2C19 panels. The Chimik Ata Clinic; International Journal of Clinical Chemistry. 412 (11–12): 1133–7. doi:10.1016/j.cca.2011.03.001. PMID 21385571. - Pfundt R, Kwiatkowski K, Roter A, Shukla A, Thorland E, Hockett R, Du BPont, Fung ET, Chaubey A (February 2016). Clinical indicators of CytoScan Dx Assay in diagnosis of developmental delay/intellectual disability. Genetics in medicine. 18 (2): 168–73. doi:10.1038/gim.2015.51. PMID 25880438. Dmitry Khodakov; Wang, Chunyang; Yu Chang, David (April 1, 2016). Diagnosis based on profiling of nucleic acid sequence variants: approaches to PCR, hybridization and NGS. Extended drug delivery reviews. 105 (pt A): 3-19. doi:10.1016/j.addr.2016.04.005. PMID 27089811. - Hovelson DH, McDaniel AS, Cani AK, Johnson B, Rhodes K, Williams PD, et al (April 2015). Develop and test a scalable next-generation sequencing system to evaluate appropriate somatic variants in solid tumors. Neoplasia. 17 (4): 385–99. doi:10.1016/j.neo.2015.03.004. PMC 4415141. PMID 25925381. Imperial TF, DF, Itzkowitz SH (July 2014). Multitarget chair DNA testing for colorectal cancer screening. New England Journal of Medicine. 371 (2): 187–8. doi:10.1056/NEJMc1405215. PMID 25006736. Rakovic E, Nofech-Mozes S, Hannah W, Baehner FL, Suskin R, Butler SM, Tuck A, Sengupta S, Elavathil L, Jani PA, Bonin M, Chang MC, Robertson SJ, Slodkovska E, Fong C, Anderson JM, Jamshidian F, Miller DP, Cherbavaz DB, Shak Shak-based study of THE DCIS Research and treatment of breast cancer. 152 (2): 389–98. doi:10.1007/s10549-015-3464-6. PMC 4491104. PMID 26119102. Extracted from the dna based diagnosis of genetic diseases pdf