

MOLECULAR GENETIC PATHOLOGY CONTENT SPECIFICATIONS

New Validated Practical Knowledge

1. Quantitative real time PCR methods and data interpretation
2. Molecular monitoring of minimal residual disease
3. Mutation scanning/detection technologies
4. Specific HLA association and adverse drug reactions, e.g.
 - HLAB*1502 linkage to Stevens-Johnson syndrome and toxic epidermal necrolysis in patients receiving carbamazepine
 - HLAB* 5701 linkage to abacavir hypersensitivity
 - HLAB* 5801 linkage to allopurinol-induced cutaneous adverse reactions
5. Quantitative DNA sequence-based BCR/ABL mutation analysis in patients with chronic myelogenous leukemia who become resistant to Gleevec and related compounds
6. Rh antigen genotyping
7. Role of HLA loci and allelic mismatches and bone marrow transplant outcome
8. Standardized recommendations for HER2 tissue fixation, testing and reporting
9. JAK2 mutations in myeloproliferative disease
10. FLT-3 Testing
11. Utility of nucleic acid testing in evolving strategy of treatment for chronic hepatitis C
12. Utility of high risk HPV genotype detection in screening cervical pap smears samples of women > 30 years of age
13. Evolving models of nucleic acid testing in bacterial infections
 - Detection of antibiotic resistant strains (MRSA, VRE)
 - Detection of toxin producing strains (C. difficile)
14. Detection of specific translocations and other mutations for the diagnosis and management of solid tumors
 - Role of KRAS testing in colon and lung carcinoma
 - EGFR mutation testing in lung carcinoma
 - BRAF mutation testing
15. Fluorescence in situ hybridization (FISH) methods and applications

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Couto JP, Prazeres H, Castro P, et al. How molecular pathology is changing and will change the therapeutics of patients with follicular cell-derived thyroid cancer. *J Clin Pathol* 2009; 62:414-21

Fundamental Knowledge

1. Types of mutations and their consequences
2. Roles of oncogenes, tumor suppressor genes, and changes in gene expression in cancer
3. Approaches to diagnosing viral infections, especially HPV
4. Nucleic acid structural features
5. Biochemistry of nucleic acid synthesis
6. Different nucleic acid detection chemistries and relative sensitivities
signal amplification methods vs target amplification
7. Risk calculations following genetic testing
8. Genotype/phenotype correlations
9. Regulatory aspects of laboratory certification
10. Interpretation of DNA sequence-based testing
11. Biochemistry of protein synthesis and degradation
12. Immunoglobulin and T-Cell receptor gene rearrangement
13. Epigenetics and DNA methylation in cancer
14. Expression arrays and array-based comparative genomic hybridization

General References

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