Preface

In the past, many tumor marker laboratory tests have not been sensitive enough for the very early detection of cancer. However, many of them have nonetheless proved useful in monitoring therapy, following the course of the tumor, and predicting prognosis. Today, cancer may be viewed as a genetic disease with various specific chromosomal and nucleotide aberrations, such as mutations, deletions, gene amplification, gene rearrangements, and translocations occurring during the transformation of a normal cell into a malignant cell.

The considerable advances in technology during the past several years have greatly enhanced our ability to detect human cancers in the very early stages of tumor formation. These technologies include: (1) nucleotide molecular assays (genomics); (2) proteomics (multiplex protein measurements); (3) DNA microarrays; and (4) bioinformatics. Many of these technologies are already helping in the integration and use of multiple biomarkers for tumors. Although the individual biomarkers may reveal only limited information, the use of multiple biomarkers can help markedly elevate the diagnostic capabilities for early detection of tumors.

Nucleic acid molecular tests are unusual in that the tests do not measure any physiological state and can be performed on fresh, frozen, or archival biological tissue specimens. Many of the molecular tests may be specific to one disease. The modern approach to the diagnosis and understanding of cancer has been characterized by the use of molecular and protein profiling. With the help of bioinformatics, artificial intelligence, and neural networks, even more accurate and sensitive diagnostic tests for cancer will surely be developed.

Cancer Diagnostics: Current and Future Trends is concerned primarily with those clinical laboratory tests that may already, or in the near future, help in the early detection, evaluation, and prediction of human tumors for specific therapeutic decisions. It should be of high interest and value to physicians who diagnose and treat cancer patients, and to clinical laboratory scientists and pathologists who are interested in diagnostic clinical laboratory tests for cancer and their future evaluation.

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