



APPLICATION OF PROTEOMICS IN CANCER RESEARCH

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Summary

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The proteome is described as the set of proteins expressed in a specific cell, tissue, or organism at a certain time. Proteomics can be defined as the systematic analysis of proteins for their identity, quantity and function. The study of the proteome, also called proteomics, has become more important recently. Proteins in cells or tissues are analysed by the separation of proteins on one matrix (two-dimensional gel electrophoresis) and identification of separated proteins in a high-throughput way (mass spectrometry) simultaneously. Early diagnosis and prevention is a key factor in reducing the mortality and morbidity of cancer. Proteomics approach may have a great effect on cancer medicine in increasing our understanding of the biologic processes of cancer cells. Discovery of new specific biomarkers are needed that may provide informative clues for early diagnosis and treatment of cancer. Recently, remarkable progress has been made in the development of new proteomics technology. The progress that has been made in this field is helpful in identifying biomarkers that can be used for early diagnosis of cancer and improving the understanding of the molecular etiological mechanism of cancer. The best strategies to reduce the mortality and morbidity of cancer patients are early diagnosis, provide effective therapy, and subsequently monitor treatment response. Some examples of present screening tools for cancer detection are prostate-specific antigen (PSA) for prostate cancer, cancer antigen 125 (CA 125) for ovarian cancer and cancer antigen 19-9 (CA-19-9) for colorectal pancreatic cancer. Moreover, main objectives for proteomics studies in cancer are to better understand tumour biology, to facilitate the development of biomarkers and to move towards bedside applications in cancer management. Current applications of proteomics in cancer research will be discussed under the light of recent scientific literature.

Key words: biomarker, cancer, proteomics