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Role of biotechnology in cancer diagnosis and control

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Despite the huge advances in cancer diagnosis and treatment, it is still the second leading cause of death in the world. Recent advances in medical biotechnology have increased researcher's knowledge of molecular events of Cancer and have created new hopes in early diagnosis and treatment of cancer. Changes in the genome and proteome of the cells disturb the normal cellular control mechanisms. Using biotechnology methods these molecular errors can be determined and appropriate treatments can be selected. In this paper, the biotechnology techniques are explained and the advantages of each of them in the diagnosis and treatment of cancer are discussed. These techniques include gene mapping, *in situ* hybridization (ISH), microarray analysis and cell culture. ISH is a method for detecting RNA and DNA inside tissues and cells using labeled probes. This method is useful in identifying genes related to the incidence and progress of cancer. Microarray technology provides the possibility of examining the tumor behavior in the living tissue and drug resistance of the patient. Cell culture is used to investigate the effects of genes involved in the incidence of cancer on cultured cells. Gene mapping is a method for determining the location of genetic markers on the related genome. This method is also used in early diagnosis of cancer and identifying high risk cancer patients. Having knowledge about molecular events of cancer can be very helpful in choosing an effective treatment and its results can be more effective and accurate than conventional methods of cancer detection and treatment.

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