Skin cancer biomarkers

Soheila S. Kordestani[1], Farzaneh NayebHabib[1,*]

Biomaterial Group, Medical Engineering Department, AmirKabir University of Technology [1]
Tehran, Post Code: 15875-4413, Iran.

*fnayebh@aut.ac.ir

SUMMARY

Skin cancer is the most common cancer. While the benefits of early diagnosis are well known, it is equally important to control treatment and cancer progress to enhance therapeutic effectiveness and prevent relapse by the patient.

INTRODUCTION

The most difficulties for sensor systems to be accepted as a relevant diagnostic and therapeutic tool for cancer detection is the ability to determine the presence of relevant biomarkers or biomarker patterns comparably to or even better than the traditional analytical systems. Biosensor and chemical sensor technologies are already used for several clinical applications such as blood glucose or blood cholesterol measurements.

EXPERIMENTAL METHODS

Tests for many tumor markers are available through commercial testing labs, but these are seldom used. Some of these tests may even be advertised as being better than the more common markers, but this hasn't yet been shown in scientific studies. In some of these cases, the tests have been taken off the market at the request of the Food and Drug Administration (FDA). Still, there are tests available for many types of cancer, but they have not yet been proven to work.

Due to the fact that the access to tumor tissue is difficult, up to now predictive and pharmacodynamics biomarkers are increasingly being used in clinical trials of cancer drugs.

Promising new sensors which have the potential to analyze the tumor on the molecular level 'non-invasively' are the focus of our researches.

- Analyzing circulating tumor cells.
- Mutation-specific PCR on the circulating DNA.
- Proteomic approaches to study serum or plasma.
- Assessing autoantibody specific for tumor cells

RESULTS AND DISCUSSION

There are some sensors for early detections. Defects (mutations) in the BRAF gene can be found in melanoma, thyroid cancer, and colorectal cancer. About half of melanomas have a BRAF mutation, most often the one called BRAF V600. This mutation causes the gene to make an altered BRAF protein that signals melanoma cells to grow and divide. This mutation can be tested for in tumor tissue. If it's found, the patient can be treated with a drug that targets the altered BRAF protein, such as vemurafenib (Zelboraf®).

S-100 is a protein found in most melanoma cells. Tissue samples of suspected melanomas may be tested for this marker to help in diagnosis.

Some studies have shown that blood levels of S-100 are elevated in most patients with metastatic melanoma (melanoma that has spread to other parts of the body). So, this test is sometimes used to look for melanoma spread before, during, or after treatment.

TABLES / FIGURES / SCHEMES

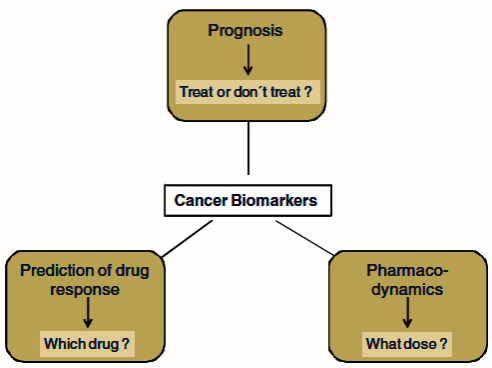

Figure1. Types of biomarkers and their application fields

CONCLUSION

Cancer biosensors are the most promising technology for early detection. These biosensors enable human to detect and treat cancers efficiently.

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