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Biomarkers for Future Medicines: An overview

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Editorial

An analytical indicator that captures what is occurring in a cell or an organism at a given moment is a biomarker or biological marker. In order to analyze natural biological mechanisms, pathogenic processes, or pharmacologic reactions to a clinical action, biomarkers are also measured and evaluated. In many research disciplines, biomarkers are used.

Biomarkers used for medication are part of a comparatively modern range of clinical instruments, called precision medicine. According to their therapeutic uses, they are classified in 3 major forms. They are known as biomarkers for molecular application, cellular biomarkers or biomarkers for imaging. All 3 types of biomarkers are used in at least 5 fields, including sampling, detection, prognosis, disease recurrence prediction and therapeutic tracking.

The presence of a moderate percentage of the disease in the population can be clarified by an ideal biomarker. In order to be clinically applicable, it must have many characteristics. First of all an ideal biomarker test must be healthy and easy to conduct. This means that, using external body fluids or blood, it must be as non-invasive as possible. Using an easy and accurate standardized platform, the biomarker test should be administered at the bedside or with a (relatively) quick laboratory test. Secondly, a biomarker should be extremely disease-specific and should ideally distinguish subtypes and causes of the disease. Third, for as early identification as possible, a biomarker should be adaptive. Moreover, the sensitivity and accuracy of the biomarker should be comparatively high and the false-positive and false-negative values should be minimized.

Many new biomarkers that require imaging technology are being created. Imaging technologies will aid in the early diagnosis and management of infections and ultimately reduce the financial pressure on health care today. In conventional imaging, CT, PET, MRI and nuclear imagery are still commonly used and are now extending into new dimensions. This also encourages physicians, at the molecular or cellular level, to view biological behavior. These will help track the delivery of medications, pharmacokinetics and pharmacodynamics required for clinical trials performed early in the lifecycle.

Biomarkers for imaging have multiple benefits. Typically, they are non-invasive, and they achieve multidimensional, intuitive outcomes. They are generally relatively comfortable for patients, offering both qualitative and quantitative results. They can be extremely helpful to physicians trying to make a decision when paired with other information sources.

Molecular biomarkers can be used to refer to non-imaging biomarkers that enable nucleic acid-based biomarkers such as gene mutations or polymorphisms and quantitative gene expression molecules to be measured in biological samples such as plasma, serum, cerebrospinal fluid and biopsy. To monitor treatment, especially in molecular medicine, medical diagnostics, disease prognosis, risk assessment and also in other areas like food safety molecular biomarkers are strongly used [1].

In developing the drug discovery process as well as in the wider biomedical science industry, biomarkers play a critical role. To extend our scope of therapies for all diseases and to broaden our knowledge of natural, balanced physiology, understanding the interaction between observable biological processes and clinical effects is crucial.

References

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