OPEN ACCESS Freely available online

ISSN: 2167-1052
Advances in Pharmacoepidemiology and Drug Safety

Commentary

Different Types of Biological Markers and Their Uses

Iguchi Asami*

Department of Pharmacology, College of Pharma Science, Hiroshima University, Tokyo, Japan

DESCRIPTION

In the biomedical context, a biomarker or biological marker is a measurable indicator of a biological state or condition. Biomarkers are often measured and evaluated using blood, urine, or soft tissue to study normal biological processes, pathogenic processes, or pharmacological responses to therapeutic interventions. Biomarkers are used in many scientific fields.

In medicine, a biomarker is a measurable indicator of the severity or presence of a medical condition. More generally, a biomarker is anything that can be used as an indicator of a particular disease state or other physiological state in an organism. According to WHO, indicators can be of a chemical, physical or biological nature and measurements can be functional, physiological, biochemical, cellular or molecular.

Biomarkers are substances introduced into organisms to study organ function or other aspects of health. For example, rubidium chloride is used for isotopic labeling to assess myocardial perfusion. It may also be a substance whose detection is indicative of a particular disease state, for example the presence of antibodies may indicate an infection. More specifically, biomarkers indicate changes in protein expression or status that correlate with disease risk or progression, or disease susceptibility to a particular treatment. A biomarker can be a characteristic biological property or molecule that can be detected and measured in a part of the body such as blood or tissue. They can indicate normal or pathological processes in the body. A biomarker may be a specific cell, molecule or gene, gene product, enzyme or hormone. Common characteristic changes in complex organ function and biological architecture can also serve as biomarkers. Although the term biomarker is relatively new, biomarkers have been used in preclinical research and clinical diagnostics for quite some time. For example, body temperature is a well-known biomarker of fever. Blood pressure is used to determine the risk of stroke. It is also well known that cholesterol levels are biomarkers and risk indicators for cardiovascular disease, and C-reactive protein (CRP) is a marker of inflammation.

Biomarkers can be classified based on a variety of parameters, including properties such as imaging biomarkers (computed tomography, positron emission tomography, magnetic resonance imaging) and molecular biomarkers. Molecular biomarkers can be used to refer to non-imaging biomarkers with biophysical properties that allow their measurement in biological samples, including genetic mutations and polymorphisms, quantitative gene expression analysis, peptides, proteins, includes nucleic acid-based biomarkers such as lipid metabolites small molecule. Biomarkers can also be classified based on their use, such as diagnostic biomarkers, staging biomarkers, disease prognostic biomarkers (cancer biomarkers), and biomarkers for monitoring clinical response to interventions increase. Another category of biomarkers includes those used for decision making in early drug development. For example, pharmacodynamic biomarkers are markers of specific pharmacological responses and are of particular interest for dose optimization studies.

If the goal of drug and medical device development is defined as prevention, mitigation or cure of disease, then it is clear that the impact must be measured and related to the stage, type and severity of the disease. This need is the basis for the development of the biomarker concept. As with translational medicine in general, biomarkers are nothing new. They have always been used by scientists trying to describe biological systems. The most common definition of biomarkers is based on their role as descriptors or measures of biological systems.

Correspondence to: Iguchi Asami, Department of Pharmacology, College of Pharma Science, Hiroshima University, Tokyo, Japan, E-mail: wei@zaho.jp

Received: 12-Jan-2023, Manuscript No. PDS-23-19913; **Editor assigned:** 16-Jan-2023, Pre QC No. PDS-23-19913 (PQ); **Reviewed:** 06-Feb-2023, QC No. PDS-23-19913; **Revised:** 16-Feb-2023, Manuscript No PDS-23-19913 (R); **Published:** 24-Feb-2023, DOI: 10.35248/2167-1052.23.12.292

Citation: Asami I (2023) Different Types of Biological Markers and Their Uses. Adv Pharmacoepidemiol Drug Saf. 12:292.