

## Use and Importance of Analytical Biochemistry in Medical Science

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### DESCRIPTION

The identification, quantitative and qualitative analysis of various molecules involved in a biological reaction is known as analytical biochemistry. In order to provide better chemical information, it also entails the creation of various tools and methodologies for the recognition, analysis, and inspection of the physical characteristics of various biochemical compositions. Analytical focus of biochemistry is on the biological chemical elements that are present in particular chemical reactions. It includes all branches of the biological sciences that do biochemical study, from botany to medicine. The study of the structures, functions and interactions of biological macromolecules, such as proteins, nucleic acids, carbohydrates, and lipids, which give cells their structure and carry out many of the activities that make life possible, is known as biochemistry.

### Importance of biochemistry in medical science

Without biochemistry, medical science would effectively cease to exist. We wouldn't have the precise chemical understanding necessary to develop the essential medications, treatments, and diagnostic equipment that are utilized on a daily basis if it weren't for the biochemists' never-ending stream of scientific discoveries. Similar to medical science itself, biochemistry is a large field of study that produces important findings every year. By exposing the underlying changes between them, biochemical approaches increase our understanding of the chemical processes and structures that support human health and disease.

Finding the cellular roots of illnesses has far-reaching ramifications. Medical scientists have the power to revolutionize world healthcare by having a good grasp of biochemistry and other related fields like molecular biology and immunology. Additionally, biochemists' research is more important than ever due to the rise of public health risks like dengue, antibiotic resistance, no communicable illnesses, air pollution and climate change.

### Analytical techniques in medicine

In a range of medical disciplines, analytical techniques are utilized to help define illnesses in order to develop rapid diagnosis techniques. Tracking metabolic pathways enables analysis of the effectiveness of therapeutic interventions and their effects on the body. To identify certain diseases and conditions, some non-invasive approaches use biomarkers in the breath and saliva.

As a result, technologies for saliva swab testing and colorimetric tests for targeted metabolite breathalyzers can be created. By using biomarkers for disease detection, the use of multiple quick test kits for sickness diagnosis in the clinic enables the early detection of illnesses for the goal of early intervention. Saliva is a valuable sample for the creation of diagnostic tools since it may be obtained without being intrusive. The mouth contains thousands of glands that release saliva. Saliva contains nearly 800 different metabolites, from quaternary ammonium ions and polyketides to carboxylic acids and steroids.

Because of this, saliva has gained recognition in the medical community as a crucial diagnostic fluid, much like urine and blood. To link differences in saliva with other bio-fluids, it is critical to have sensitive detection techniques. Saliva samples can also be subjected to analytical procedures to examine levels of pharmaceutical medications in the body, track immunological responses to infection, and look for illegal drugs. One of the most popular techniques for sampling saliva is the passive drool method. When the head is tilted, saliva that has accumulated on the mouth floor is collected in a cryovial. This approach is highly economical. Oral swabs might also be employed.

Exhaled breath is another non-invasive sample type utilized by medical diagnostic instruments. The diffusion of Volatile Organic Compounds (VOCs) from the blood to the alveolar air is a factor to be taken into account when utilizing the breath as a sample. Additionally, extra care must be taken to minimize interference from environmental VOCs or ones that do not

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come from the source in order to maximize sample quality. The breath has been used as a sample in a variety of analytical methods. But there are still problems with regard to sensitivity and precision. Sweat is another typical non-invasive biological fluid used in clinical settings for biomedical diagnostics. Sweat biomarkers are applicable to analytical tools like transdermal patches. The patch can often track infections based on distinct biomarkers that are present and connect to particular diseases and infections. Because of this, analytical chemistry techniques are frequently employed in medicine to aid in rapid diagnosis of illness and infection to enable early management, healthcare analyst and chemist.

Of all, the goal of medical science is not to merely increase our understanding of how life functions. Its purpose is to advance clinical practice in the real world. This is made possible by the molecular phenomena uncovered through biochemical analysis, which offers research that provides local health practitioners

more freedom to carry out their responsibility of care. All biochemical processes and reactions are necessary for life to exist on Earth. Biochemistry is and will continue to be one of the most significant fields of science by fusing this knowledge with useful methods to preserve health, comprehend diseases, identify viable remedies and improve our comprehension of the origins of life on Earth.

## CONCLUSION

In reality, the developments produced by biochemists in the laboratory will determine how medical research develops over the next ten years. A biochemical study just one week prior to the posting of this blog discovered that a common acne medication can prevent arterial hardening, and another revealed that women have stronger episodic memory than men. The potential for research appears to be nearly infinite.