Diagnostic Applications of Biotechnology

Cancer Diagnostics

1.

Companion Diagnostics

Identifies specific biomarkers to match patients with targeted therapies, ensuring personalized cancer treatment.
3.

Imaging Biomarkers

Identifies specific molecular markers using imaging techniques like PET or MRI, enhancing cancer detection and characterization.

Infectious Disease Diagnostics

5.

Next-Generation Sequencing (NGS) for Infectious Diseases

Sequences pathogen genomes to understand genetic variations, aiding in tracking disease outbreaks and designing targeted treatments.
7.

Microbial Whole Genome Sequencing

Analyzes entire microbial genomes to trace disease transmission routes and understand antibiotic resistance patterns.

Neurological Disease Diagnostics

9.

Genetic Testing for Neurological Disorders

   - Analyzes genetic mutations associated with neurological diseases, enabling early detection and risk assessment.

11.

4.

Biomarker Panels for Heart Diseases

   - Measures cardiac-specific biomarkers like troponins and B-type natriuretic peptide (BNP) to diagnose heart conditions and assess severity.
13.

Cardiac Imaging Techniques

   - Utilizes imaging modalities like echocardiography and CT angiography to visualize heart structure and function, aiding in diagnosis.

Metabolic Disease Diagnostics

15.

Metabolomics Profiling

   - Analyzes small molecules in body fluids, offering insights into metabolic pathways and aiding in understanding metabolic diseases.
17.

6.

Autoantibody Profiling

   - Detects specific autoantibodies in blood, aiding in the diagnosis of autoimmune diseases like rheumatoid arthritis and lupus.
19.

Immunological Assays

   - Measures immune system components like cytokines and antibodies, providing insights into autoimmune disease activity and

progression.

Respiratory Disease Diagnostics

21.

Pulmonary Function Testing

- Measures lung capacity and airflow to diagnose conditions like chronic obstructive pulmonary disease (COPD) and pulmonary fibrosis.
23.

8.

Genetic Testing for Gastrointestinal Disorders

- Identifies genetic mutations related to diseases like inflammatory bowel disease (IBD) and celiac disease, guiding diagnosis and treatment.
25.

Stool Biomarker Analysis

- Examines stool samples for specific biomarkers, facilitating the diagnosis of gastrointestinal diseases such as colorectal cancer and inflammatory bowel disease.