

## Biochemical identification

## SmartNote: Why manual microorganism identification is critical for all microbiology laboratories

Accurate and definitive microorganism identification is essential in an industrial setting to identify microbial contaminants which can cause food spoilage, environmental contamination and contamination of pharmaceutical products. Biochemical tests are among the most important methods for microbial identification, even when a microbiology laboratory is using an automated system.

### What are biochemical tests?

Biochemical reactions can reveal the vital information necessary for accurately identifying the genera of various bacteria or yeast within a sample. Biochemical tests are used to differentiate on the basis of biochemical activity. The difference in protein and fat metabolism, carbohydrate metabolism, enzyme production and compound utilization ability are some factors that aid in bacterial identification.

Routine biochemical tests include catalase testing, oxidase testing, substrate utilization tests, hydrogen sulphide production and tests for carbohydrate fermentation.

Microbial biochemistry tests shorten the time required to identify microorganisms, reduce costs, and ensure or enhance the accuracy of identification of an unknown microorganism. The presence of specific bacteria and their concentration must be determined, to assess and control safety hazards, the potential for spoilage or to ensure correct product characteristics.

The presence of contaminants in food and pharmaceutical products may not only affect their quality and safety, but also impact business credibility.

Manual biochemical panel tests employ conventional and chromogenic substrates for the identification of medically important microorganisms. Panels are available for the identification of both common types of bacteria, like staphylococci, as well as more complex pathogens like Enterobacteriaceae, yeasts, non-fermenters and *Listeria*. These systems are ideal for standalone testing, due to the comprehensive range of bacteria they can identify, or for complementing automated systems that often require a backup method for less common bacterial samples due to limits in their menu of organisms.

### How do they work?

Biochemical panels are inoculated with a fluid suspension of the suspect isolate. This inoculum rehydrates the dehydrated reactants in the test panels and initiates test reactions. After incubation of the panel, each test cavity is examined for reactivity by noting the development of a color. In some cases, reagents must be added to the test cavities to provide a color change. The resulting pattern of positive and negative test scores is used as the basis for identification of the test isolate by comparison of results to reactivity patterns stored in a database.

### Thermo Scientific™ RapID™ Systems

Traditional manual, confirmatory, ID panels often come with a caveat of a lengthy time-to-result of 24-48 hours, which can be frustrating when results are needed to guide critical, informed decisions. However, Thermo Scientific™ RapID™ Systems work differently, using enzyme technology to reduce time-to-result to just 4 hours. The advantage – fast, same-day, definitive bacterial identification for 400+ microorganisms. And, combined with advanced Thermo Scientific™ RapID™ ERIC™ Software, users will experience reduced turnaround time, visible color reactions and precise reporting for more organisms on more platforms\*.

\*Versus traditional testing methods.



### Thermo Scientific™ Microbact™ Kits

Microbact Systems provide easy-to-read biochemical identification with consistent volumes and fewer reagents for Gram-negative organisms, *Listeria* and *Staphylococcus aureus*. Combined with Microbact Software, you will experience simpler procedures, reduced turnaround time with results in 18 – 24 hours plus a 4-hour option for *Listeria* spp., visible color reactions and precise reporting for more organisms on more platforms versus traditional methods.



For more information, visit [thermofisher.com/RapID](https://thermofisher.com/RapID)