

DuPont Qualicon RiboPrinter® System

APPLICATION PROFILE

What's in a name? Unless it has been assigned by reproducible, definitive DNA typing, the organism might have the wrong name tag

In microbiology, an organism by any other name is another organism. Or maybe it isn't. A recent study that used genetic fingerprinting by the RiboPrinter® microbial characterization system made this problem dramatically clear to participants.

As many labs already know, the naming of bacteria can sometimes merely serve as an exercise in attaching labels. The variability of conditions, subjectivity of data interpretation and the lack of reproducible results that are common with traditional biochemical tests have made definitive answers nearly impossible for microbiology.

Labs can't agree on a name

A report midway through an on-going study in the UK clearly showed the failings of methods available up to now for identifying bacteria. In contrast, these same mid-study results also clearly demonstrate the definitiveness of the RiboPrinter® system:

- Of the 23 isolates analyzed in the first six months of the trial, only 3 were consistently identified by all 40 participants. **Up to nine different genera were reported for a single sample.** This wide range of identification demonstrated all too well how much results can vary from lab to lab.
- Also among the 23 isolates involved in the first half of the study, duplicate samples were circulated among 36 labs. With the first set of twin organisms, a surprising 58 percent of the participating labs couldn't tell that the strains were the same. Among the labs which reported that the organisms were different, **10 labs determined that the samples were of different genera**; 10 other labs obtained the same genus but a different species. Yet RiboPrint® patterns showed unequivocally that the samples were the same.
- With the second set of duplicate organisms, 42 percent of the participants incorrectly determined the samples were from different genera and another 8 percent mistakenly showed the samples were of the same genus but different species. Again, the RiboPrinter® system correctly showed that the samples had a common pattern (see Figure 1). Only one other laboratory in the study used an automated system, the Vitek from BioMerieux Vitek. The lab that used this system reported the first of the duplicates as *Enterobacter intermedius* and identified the second as *Citrobacter freundii*—both a different genus and species.



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Making the case for standardization

The extremely poor performance of traditional phenotypic identification methods compared to the RiboPrinter® system's ability to easily recognize the duplicates is a clear example of the superior performance of genetics-based characterization. It also dramatically makes the case for the standardization and accuracy available with the DNA-based RiboPrinter® system.

Organized by Dr. Clive Thompson of Yorkshire Environmental in the U.K., the round-robin study was begun in 1996. It involved 27 labs in the UK, 12 in other European countries and Qualicon™. The trial's objectives were to assess reproducibility between labs in identifying coliform bacteria. Study results were also intended to check for mis-identifications of aeromonads as coliforms. Plans were for the year-long study of 42 isolates to include at least three reference type cultures.

Conclusion

This study illustrates a fundamental problem labs struggle with but have been powerless — until now — to solve: Traditional testing using commercial kits or even automated biochemistry-based systems can offer a lab little comfort when assigning a name to a tested organism.

What participants have learned so far is that, in microbiology, a name is only as good as the technology that assigned it.

In reality, an organism by any other name may be exactly the same.

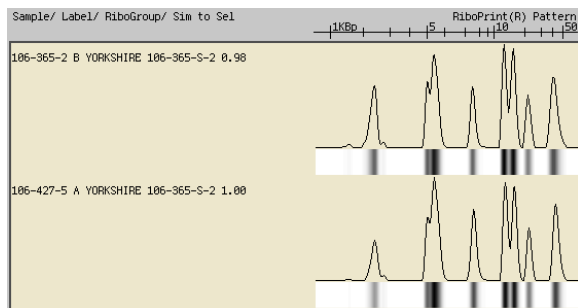


Figure 1. The Vitek GNI from BioMerieux, the only automated test other than the RiboPrinter® system used in the Yorkshire study, identified duplicate isolates as two completely different organisms — *Enterobacter intermedius* and *Citrobacter freundii*. RiboPrint® patterns (above) clearly demonstrate that the duplicate samples joined the same RiboGroup and were correctly recognized as being the same.

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