

S011

2-hour Symposium

Hot topics in culture-based diagnostics

Chromogenic agar for identification and antimicrobial susceptibility testing

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Together with the continued development of novel molecular-based technologies for rapid, high-throughput detection of pathogenic bacteria, isolation and identification of pathogenic microorganism remains an important aspect in diagnostic microbiology. However, the time to result with conventional cultures is 2 to 3 days. In recent years, a wide range of chromogenic culture media has been made commercially available providing useful alternative tools for conventional diagnostic microbiology.

These media detect key microbial enzymes as diagnostic markers for pathogens with high specificity through the use of "chromogenic" substrates incorporated into a solid agar-based matrix.

In contrast to conventional culture media, chromogenic media combine the isolation and identification of the target microorganisms in a single step, thereby reducing the need to subculture for further biochemical testing and hence the time to result. Examples of target pathogens include *Staphylococcus aureus*, *Streptococcus agalactiae*, *Escherichia coli*, *Salmonella* spp. and *Candida* spp. By the inclusion of multiple chromogenic substrates, facilitating the differentiation of polymicrobial cultures, these chromogenic are becoming widely used in clinical situations for preliminary screening of a range of samples for a broad variety of pathogens, e.g. urinary tract infections for *Escherichia coli* and other enterobacteriaceae, antenatal screening for Group B Streptococci or enhanced discrimination of yeasts from a variety of clinical samples. Some of these applications will be discussed with their advantages and limitations.

In addition, chromogenic media are increasingly used to screen for resistant pathogens such as Methicillin-resistant *Staphylococcus aureus* (MRSA), Vancomycin Resistant Enterococci (VRE), Extended Spectrum  $\beta$ -Lactamase-producing Enterobacteria (ESBL), frequent causes of hospital-acquired infections, or infections caused by *Clostridium difficile*.

Active surveillance cultures of patients for carriage of these resistant pathogens or *Clostridium difficile* facilitate an early contact isolation and treatment, thereby enabling subsequent implementation of barrier precautions that should ultimately lead to a reduction in life-threatening infections. A search for the optimal 'rapid' screening assay has resulted in a number of studies comparing the utility of molecular and culture-based tests. Based on results of own experience and results of published studies, comparing the utility of both molecular and culture-based tests for eg MRSA, VRE or *Clostridium difficile* detection, several aspects on performance characteristics in terms of sensitivity and specificity, user friendliness and cost-effectiveness will be discussed to appraise their utility in routine clinical diagnostics, and to facilitate the microbiologist in making evidence based choices on diagnostic algorithms.