Brief Communication

Staphylococcus pseudintermedius for CAMP-test

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Abstract: CAMP test reliably detects Listeria monocytogenes (Lm) and Streptococcus agalactiae (group B streptococcus, GBS); it is traditionally performed streaking the tested isolate perpendicularly to Staphylococcus aureus (Sa), provided that reference Sa strains (that produce β-hemolysin) are used. In a zone of β-hemolysin activity, in fact, GBS and Lm form typical arrow-shaped hemolytic areas. While Sa production of the toxin is strain-dependent, however, that of Staphylococcus pseudintermedius (Sp), a pet-owner colonizer and an emerging human pathogen, is constitutive, then observed in all clinical isolates. Therefore, Sp may indeed represent a valid alternative to perform the assay.

Keywords: Staphylococcus pseudintermedius, β-hemolysin, CAMP-test, Listeria monocytogenes, GBS

CAMP test is one of the most affordable, easy-to-perform methods that may be used in clinical laboratories to identify Listeria monocytogenes (Lm) and Streptococcus agalactiae (group B streptococcus, GBS) from clinical samples [1, 2]. The term “CAMP” comes from the initials of authors (Christie, Atkins, and Munch-Petersen) who first studied this assay as well as the particular phenomenon it is based on; we mean that test positivity is typically indicated by formation of an arrow-shaped hemolysis (“arrowhead”) where GBS and Lm grow in a zone of Staphylococcus aureus (Sa) β-hemolysin activity perpendicularly to Sa and without touching [1-3].

While Sa β-hemolysin synthesis is strain-dependent (then only producing strains may be used for CAMP test), Staphylococcus pseudintermedius (Sp), a coagulase-positive pet-owner colonizer and an emerging human pathogen, constitutively produces the toxin [3], that is therefore found in all isolates. Hence, any clinical Sp may indeed represent a valid alternative to reference Sa strains. Accordingly, Figure 1 reports a positive test carried out using the Sp strain DSM 25713 [3], along with a nonhemolytic GBS (identified with Liofilchem® O.A. Listeria Agar (Figure 2), as well as molecularly). The test was performed on the Liofilchem® Tryptic Soy agar medium (TSS), that is based on a sheep blood composition, and read after 24 h incubation, at 36±1°C, under microaerophilic conditions.

CAMP test is a diagnostic tool that reliably and quickly provides presumptive identification of GBS and Lm. Arrowheads promptly develop when bacterial inocula are in an early stage of growth and the sheep blood plate is prewarmed to 37°C [1, 2]. Although, traditionally, only Sa is used (provided that reference strains producing β-hemolysin are previously obtained), we highlight that, indeed, any Sp clinical isolate represents a reliable alternative; production of β-hemolysin (that is strain-dependent in Sa) is in fact intrinsical in Sp, and almost pathognomonic.

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Disclosure of conflict of interest

None.
Staphylococcus pseudintermedius and CAMP-test

Figure 1. positive CAMP test: top, L. monocytogenes inoculum - bottom, GBS (nonhemolytic variant) inoculum - middle (horizontal inoculum) S. pseudintermedius inoculum. The test is performed on Tryptic Soy agar (TSS, Liofilchem®).

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References

