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Closing the Brief Case: *Staphylococcus intermedius* Group—Look What the Dog Dragged In

William Lainhart,[a] Melanie L. Yarbrough,[a] Carey-Ann D. Burnham[a]

[a]Department of Pathology and Immunology, Washington University School of Medicine, St. Louis, Missouri, USA

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ANSWERS TO SELF-ASSESSMENT QUESTIONS

1. Which biochemical test can be helpful as a screen to differentiate SIG species from *Staphylococcus aureus*?

   A. Catalase
   B. Pyrrolidonyl arylamidase (PYR)
   C. Coagulase
   D. Ornithine decarboxylase

   Answer: B. Whereas both SIG members and *S. aureus* are catalase and coagulase positive, only SIG species are PYR positive. Both are negative for ornithine decarboxylase. However, an ornithine-positive *Staphylococcus* species that also gives a positive reaction in latex agglutination and PYR testing is *Staphylococcus lugdunensis*.

2. Disk diffusion testing with which antimicrobial agent should be tested as a surrogate for methicillin resistance testing with members of the *Staphylococcus intermedius* group?

   A. Cefazolin
   B. Methicillin
   C. Oxacillin
   D. Cefoxitin

   Answer: C. Oxacillin has been shown to be a better surrogate marker to predict the presence of *mecA* and methicillin resistance in SIG species. This is in contrast to *S. aureus*, where cefoxitin is the surrogate for prediction of *mecA*-mediated methicillin resistance. This was added to the CLSI M100 guidelines in 2016.

3. Which staphylococcal species is not a member of the *Staphylococcus intermedius* group?

   A. *Staphylococcus pseudintermedius*
   B. *Staphylococcus delphini*
   C. *Staphylococcus lugdunensis*
   D. *Staphylococcus intermedius*

   Answer: C. The SIG consists of three species: *Staphylococcus intermedius*, *Staphylococcus pseudintermedius*, and *Staphylococcus delphini*. Like the members of the SIG, *Staphylococcus lugdunensis* can test positive for both coagulase (latex agglutination testing) and PYR but is also ornithine decarboxylase positive.

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Address correspondence to Carey-Ann D. Burnham, cburnham@wustl.edu.

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TAKE-HOME POINTS

- SIG species can easily be misidentified as *S. aureus* in clinical laboratories, but they can be differentiated using MALDI-TOF MS.
- Biochemically, PYR can be used to differentiate SIG members (PYR positive) from *S. aureus* (PYR negative).
- Whereas the prevalence of methicillin resistance in SIG veterinary isolates was low historically (approximately 5% until the early 2000s), it has been increasing rapidly, with estimates as high as 30% in 2007.
- Methicillin resistance in SIG isolates can be detected using oxacillin disk diffusion as a surrogate marker, unlike in *S. aureus* and coagulase-negative staphylococci, for which cefoxitin disk diffusion is used.
- Immunochromatographic testing for the presence of PBP2a, which confers methicillin resistance, can be performed for SIG isolates, though induced PBP2a testing (using cefoxitin) is needed for some SIG isolates.