

Bacitracin/SXT Sensitivity

Intended Use:

Bacitracin differential disks are used to presumptively identify Group A, beta-hemolytic streptococci from other beta-hemolytic streptococci. The combination of SXT sensitivity increases the accuracy of the results.

Principle:

Bacitracin is an antibiotic isolated from *Bacillus subtilis*. It inhibits cell wall synthesis mainly through inhibiting the biosynthesis of peptidoglycan. SXT inhibits folate metabolism which interferes with bacterial DNA synthesis. Group A, beta-hemolytic streptococci are more sensitive to bacitracin than other beta-hemolytic streptococci.

Test Procedure:

The standard protocol has been modified for our lab.

- Using a loop, select 3-4 well isolated colonies, ideally from an 18-24 hour culture. Transfer to a small amount of sterile water.
 - Adjust the turbidity to 0.5 McFarland standard.
- Use the procedure outlined in [antimicrobial susceptibility testing](#) to swab the entire plate to obtain confluent growth.
- Visually divide the plate in thirds, place a bacitracin and SXT in their section of the plate. Using sterile forceps or a swab, lightly but firmly press the disks to the agar surface to adhere them.
 - Save the other section for the [optochin](#) disk.
- Invert the plates and incubate them for 18-24 hours at 35°C in 5-10% CO₂.
- Incubate another 24 hours if the results are negative.

Results:

- Any zone of inhibition around the disk is considered sensitive (S).
- No zone of inhibition with growth up to the disk is considered resistance (R).

Bacitracin	SXT	Presumptive ID
S	R	Group A b-streptococci
R	R	Group B b-streptococci
R	S	Not Group A or B b-streptococci
S	S	Rule out Group A or B with serologic tests

This table is from MacFaddin, *Biochemical Tests for Identification of Medical Bacteria*.

Limitations:

- Only beta-hemolytic streptococci should be tested.
- While this test is accurate it is not highly specific. Other biochemical or serological tests are required for accurate identification.
- The growth should be confluent. Too light of a growth could cause some non-group A streptococci to appear susceptible to bacitracin.