

# SIM Medium

## Intended Use

SIM Medium is used to differentiate enteric bacilli on the basis of sulfide production, indole formation and motility.

## Summary and Explanation

Hydrogen sulfide production, indole formation and motility are distinguishing characteristics which aid in the identification of the *Enterobacteriaceae*, especially *Salmonella* and *Shigella*. SIM Medium, therefore, is useful in the process of identification of enteric pathogens.

## Principles of the Procedure

The ingredients in SIM Medium enable the determination of three activities by which enteric bacteria can be differentiated. Sodium thiosulfate and ferrous ammonium sulfate are indicators of hydrogen sulfide production. The ferrous ammonium sulfate reacts with  $H_2S$  gas to produce ferrous sulfide, a black precipitate.<sup>1</sup> The casein peptone is rich in tryptophan, which is attacked by certain microorganisms resulting in the production of indole. The indole is detected by the addition of chemical reagents following the incubation period. Motility detection is possible due to the semisolid nature of the medium. Growth radiating out from the central stab line indicates that the test organism is motile.

## Formula

### BBL™ SIM Medium

Approximate Formula\* Per Liter

Pancreatic Digest of Casein .....	20.0	g
Peptic Digest of Animal Tissue.....	6.1	g
Ferrous Ammonium Sulfate.....	0.2	g
Sodium Thiosulfate .....	0.2	g
Agar .....	3.5	g

\*Adjusted and/or supplemented as required to meet performance criteria.

## Directions for Preparation from Dehydrated Product

1. Suspend 30 g of the powder in 1 L of purified water. Mix thoroughly.
2. Heat with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Dispense and autoclave at 121°C for 15 minutes.
4. Test samples of the finished product for performance using stable, typical control cultures.

## Procedure

Loosen caps, boil and cool before use. Using growth from a pure culture, stab an inoculating needle two-thirds of the distance to the bottom in the center of the tube. Incubate tubes with loosened caps for 18-24 hours at  $35 \pm 2^\circ\text{C}$  in an aerobic atmosphere.

## User Quality Control

### Identity Specifications

#### BBL™ SIM Medium

Dehydrated Appearance: Fine, homogeneous, free of extraneous material.

Solution: 3.0% solution, soluble in purified water upon boiling. Solution is light to medium, yellow to tan, clear to slightly hazy.

Prepared Appearance: Light to medium, yellow to tan, clear to slightly hazy.

Reaction of 3.0%

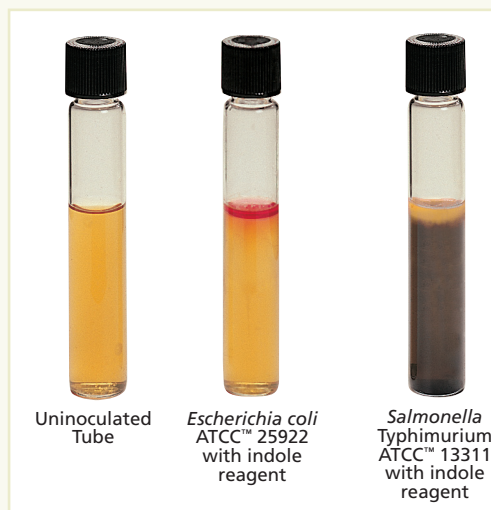
Solution at 25°C: pH  $7.3 \pm 0.2$

### Cultural Response

#### BBL™ SIM Medium

Prepare the medium per label directions. Stab inoculate using heavy inocula of fresh cultures and incubate at  $35 \pm 2^\circ\text{C}$  for 18-24 hours.

ORGANISM	ATCC™	RECOVERY	MOTILITY	H <sub>2</sub> S	INDOLE
<i>Escherichia coli</i>	25922	Good	+	-	+
<i>Salmonella enterica</i> subsp. <i>enterica</i> serotype Typhimurium	13311	Good	+	+	-
<i>Shigella sonnei</i>	9290	Good	-	-	-



## Expected Results

Following incubation, observe for motility (diffuse growth outward from the stab line or turbidity throughout the medium) and for H<sub>2</sub>S production (blackening along the stab line). To detect indole production, add three or four drops of Kovacs' reagent<sup>2</sup> and observe for a red color (positive reaction).

Consult appropriate references for activities of specific microorganisms.<sup>2-4</sup>

## References

1. MacFaddin. 1985. Media for isolation-cultivation-identification-maintenance of medical bacteria, vol. 1. Williams & Wilkins, Baltimore, Md.
2. Ewing. 1986. Edwards and Ewing's identification of *Enterobacteriaceae*, 4th ed. Elsevier Science Publishing Co., Inc., New York, N.Y.
3. Holt, Krieg, Sneath, Staley and Williams (ed.). 1994. Bergey's Manual™ of determinative bacteriology, 9th ed. Williams & Wilkins, Baltimore, Md.
4. Farmer. 1999. In Murray, Baron, Pfaller, Tenover and Tenover (ed.), Manual of clinical microbiology, 7th ed. American Society for Microbiology, Washington, D.C.

## Availability

### BBL™ SIM Medium

#### BAM

Cat. No.	211578	Dehydrated – 500 g
	221010	Prepared Tubes – Pkg. of 10
	221011	Prepared Tubes – Ctn. of 100