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Document Number: MIC51300

Version No: 1.0

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**Distribution:**

Microbiology Test Manual

**Effective:**

Date Reviewed:

Next Review:

Document Name: Motility Test

Approved By:

Status: **DRAFT**

**PURPOSE:** The motility test is used to detect the presence of flagella by bacteria microscopically.

**SAMPLE INFORMATION:**

Type

Few, fresh well isolated colonies

**REAGENTS and/or MEDIA:**

- Thioglycollate broth (THIO)

**SUPPLIES:**

- Disposable loops
- Wooden sticks
- Sterile pipettes
- Glass microscope slides
- Cover slips
- Sterile saline

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### **SPECIAL SAFETY PRECAUTIONS:**

Containment Level 2 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials or cultures.

- Lab gown must be worn when performing activities with potential pathogens.
- Gloves must be worn when direct skin contact with infected materials is unavoidable.
- Eye protection must be used where there is a known or potential risk of exposure to splashes.
- All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC).
- The use of needles, syringes, and other sharp objects should be strictly limited.

All patient specimens are assumed to be potentially infectious. Universal precautions must be followed. Since viable micro-organisms are used, all cultures must be handled with appropriate precautions. All equipment in contact with cultures should be decontaminated by appropriate methods.

### **QUALITY CONTROL:**

- Quality control performed as tested:
  - Positive: *Escherichia coli* ATCC 25922
  - Negative: *Klebsiella pneumoniae* ATCC 700603
- A TQC order is automatically generated when test is ordered to record the QC results.

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**PROCEDURE INSTRUCTIONS:**

Step	Action
<b>Performing the motility test</b>	
1	Use fresh growth from an agar plate and suspend isolated colonies into the Thioglycollate broth. Use a light inoculum (not visibly turbid) <b>NOTE:</b> It is acceptable to suspend the organism in a small amount of saline for an initial wet mount, but follow with incubation of Thioglycollate broth if the result is negative.
2	Incubate the Thioglycollate broth as follows: <ul style="list-style-type: none"> <li>• <i>Listeria</i> and <i>Enterococcus</i> spp. for 2 to 4 hours at room temperature.</li> <li>• Non-fermenting, Gram-negative rods for 24 hours at room temperature.</li> <li>• Other organisms, including <i>Bacillus</i> spp. for 2 to 24 hours at 35°C.</li> </ul>
3	While wearing gloves, place a small drop of the broth on the center of a microscope slide. Add a coverslip and allow the organism to “settle” for a minute.
4	Move the condenser out of the path of illumination and observe under high power magnification (40X).

**INTERPRETATION OF RESULTS:**

IF	THEN
Directional and purposeful motility	<b>Motility Test = Positive</b>
No directional movement observed	<b>Motility Test = Negative</b>

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**PROCEDURE NOTES:**

- *Bacillus* spp. should be motile. Lack of motility could indicate *Bacillus anthracis*.
- *Enterococcus casseliflavus* and *Enterococcus gallinarum* are motile.
- *Listeria* organisms are motile at room temperature but not at 35°C, with tumbling motility.
- *Yersinia enterocolitica* is motile at room temperature but not at 35°C.
- *Campylobacter* spp. will display darting motility.

**LIMITATIONS/PRECAUTIONS:**

1. *Bacillus* spp. is best tested directly from a fresh plate. If a fresh plate is not available, inoculate a plate and incubate for 4 hours and then perform wet mount.
2. Excessive heat on microscope can affect the results.

**REFERENCES:**

- Clinical Microbiology Procedures Handbook, 4<sup>th</sup> edition, ASM Press, 2016

**REVISION HISTORY:**

REVISION	DATE	Description of Change	REQUESTED BY
1.0	5 APR 19	Initial Release	L. Steven

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