TITLE: Motility	Revision Date: 11-March-2016	Issue Date: 11-March-2014
Document Number: MIC51300	Status: Approved	
Distribution: Microbiology Test Manual	Page: 1 of 4	
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PURPOSE:

The Motility Test is used to detect the presence of flagella by bacteria, allowing them to travel in the microscopic field. Movement is observed microscopically.

SAMPLE INFORMATION:

Type	Well isolated colonies
Source	18-24 hour culture

REAGENTS and/or MEDIA:

Type	TSB broth
Source	Oxoid
Stability	Stable until expiration date indicated
Storage Requirements	Store at 2-8°C away from direct light
Criteria for rejection and follow up action	Do not use if there are signs of contamination or deterioration (shrinking/discoloration).
For wet prep	Sterile saline or any broth which does not contain carbohydrate and will support the growth of organisms (BHI, TSB)

SUPPLIES:

- Inoculating wire
- Motility test tube
- Glass slides and cover slips

SPECIAL SAFETY PRECAUTIONS:

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

PROCEDURE INSTRUCTIONS:

Step	Action	
Performing a Motility Test		
1	**LIS CODE: ^MOTWP** Make a light suspension of isolated colonies in broth or saline • Saline can be used for Gram negative bacilli but not for *Listeria sp*	
2	Place a drop on the centre of a microscope slide; add cover slip. Allow the organisms to "settle" for a minute.	
3	Swing the condenser out of the path of illumination Observe under high power (40X) for forward, directional movement.	
IF		**THEN**
Sample show forward, directional movement		Organism is motile
No directional movement observed		Incubate organism in broth, proceed to Step 4

4	Incubate as follows: • *Enterobacteriaceae*: 35°C for 24h • *Listeria sp* and *Yersinia sp*: incubate 2 tubes: ➢ One at 35°C ➢ One at 25°C • If there is a question regarding a negative result, incubate at 25°C

INTERPRETATION OF RESULTS:

Result	Interpretation
Directional purposeful motility	**POSITIVE; motile** • *Listeria sp* will exhibit tumbling motility at 25°C • *Campylobacter sp* will exhibit darting motility • *Enterobacteriaceae .casseliflavus* and *E.gallinarum* are motile • *B.anthracis* is motile
Vibrational or jiggling/shaking movement	**NEGATIVE; non-motile** • Brownian movement

NOTES AND PRECAUTIONS:

1. Motility tests may show a false-negative reaction. The organism may be weakly motile, or the flagella may be damaged due to heating, shaking, or other trauma.
2. Bacillus spp. should be motile. Lack of motility could indicate B. anthracis.

3. A large number of *E. casseliflavus* and *E. gallinarum* organisms have been reported as non-motile using some tube motility agar. If a vancomycin MIC is between 4 and 16 µg/mL and the isolate is ampicillin susceptible, but the enterococcus is non-motile, confirm results with the 2h broth method (incubate the suspension for two hours in broth before examining).
4. Listeria organisms are motile at 25^{o}C but not at 35^{o}C. On wet mount they exhibit tumbling motility.
5. Yersinia enterocolitica is motile at 25^{o}C but not at 35^{o}C.

REFERENCES:

- Garcia, L. S. (2010). Motility Tests. *Clinical Microbiology Procedures Handbook vol.1* , pp. 3.17.31.1-3.17.31.3.

REVISION HISTORY:

REVISION	DATE	Description of Change	REQUESTED BY
1.0	31Dec2013	Initial Release	A.Darrach