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MOTILITY INDOLE UREA AGAR (M.I.U.)

Medium designed for differentiating Enterobacteriaceae based on motility, indole production and urease activity.

REF: BS.1/NZ01.100.0100	100 Gram	REF: BS.1/NZ01.250.0250	250 Gram
REF: BS.1/NZ01.500.0500	500 Gram		

PRINCIPLE AND INTERPERTATION

Tryptone is a pancreatic digest of casein. Casein is the main protein of milk and is a rich source of amino acid nitrogen. This hydrolysate has high tryptophan content and is therefore used in media for testing the indole reaction. Sodium chloride maintains the osmotic balance. Potassium dihydrogen phosphate buffer the medium. Phenol Red is a pH indicator. The small amount of agar makes the medium semisolid. Bacterial motility can be observed directly from examination of the tubes following incubation. Growth spreads out of the line of inoculation if the organism is motile. Highly motile organisms provide growth throughout the tube. Growth of non -motile organisms only occurs along the stab line. Urease activity was observed by a change of color to red. When organisms utilize urea, ammonia is formed during incubation which makes the reaction of these media alkaline, producing a red-pink color. Consequently, urease production may be detected by the change in the phenol red indicator. Organisms that possess the enzyme “tryptophanase” degrade the amino acid tryptophan to indolepyruvic acid, from which indole can be formed through deamination.

MEDIA COMPOSITION

Item	Formula per liter of medium
Tryptone	30.00 gm
Potassium Dihydrogen Phosphate	5.00 gm
Sodium Chloride	5.00 gm
Phenol Red	0.01 gm
Agar	3.00 gm

Final pH (at 25ºC) 6.9± 0.2 ** Formula adjusted, standardized to suit performance parameters.

PRECAUTIONS AND WARNINGS

Media to be handled by entitled and professionally educated person. Do not ingest or inhale.

Good Laboratories practices using appropriate precautions should be followed in:

- Wearing personnel protective equipment (overall, gloves, glasses,).
- Do not pipette by mouth.
- In case of contact with eyes or skin; rinse immediately with plenty of soap and water. In case of severe injuries; seek medical advice immediately.
- Respect country requirement for waste disposal.
  S56: dispose of this material and its container at hazardous or special waste collection point.
  S57: use appropriate container to avoid environmental contamination.
  S61: avoid release in environment.

For further information, refer to the motility indole urea agar material safety data sheet.

STORAGE AND STABILITY

BioScien motility indole urea agar stored between 15-30°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use. Product performance is best if used within stated expiry period.

PREPARATION

Suspend 43.0 g in 1 liter of distilled water. Heat until completely dissolved. Autoclave at 121 °C for 15 minutes. Cool to 50 °C. Aseptically add 50 ml of Urea 40% supplement.

Deterioration

The color of ***BioScien*** MIU MEDIUM powder is Beige, free-flowing, homogeneous. Prepared media is Light amber, clear semisolid Appearance: clear semisolid.

EQUIPMENT REQUIRED NOT PROVIDED

- Sterile petri dishes
- Incubator
- Autoclave

PERFORMANCE CHARACTERISTICS

Cultural characteristics observed after an incubation at 35-37°C for 18-48h.

Organisms (ATCC)	Motility	Indole production	Urease reaction
Escherichia coli ATCC 25922	+	+	-
Shigella flexneri ATCC 9199	-	-	-
Salmonella typhi ATCC 14028	+	-	-
Proteus mirabilis ATCC 25933	+	-	+

INTERPRETATION OF RESULTS

1. Motility was observed by growth extending from the line of inoculum or diffuse turbidity of the medium. Non-motile organisms grow only along the line of inoculation.

2. Urease activity was observed by a change of color to red.

3. Indole production is indicated by the formation of a pink to red color after the addition of three or four drops of Kovac's reagent (Code 20070) to the surface of the medium. A negative reaction is indicated by the development of a yellow color. The red color of phenol red in alkaline pH did not interfere because of the acidity of kovac's reagent. The efficacy of MOTILITY INDOLE UREA AGAR (M.I.U.) and Kligler Iron Agar for presumptive recognition of Salmonella and Shigella is shown in the work of Rosa Fraile et al (1)

QUALITY CONTROL

To ensure adequate quality control, it is recommended that positive and negative control included in each run. If control still out of range please contact ***BioScien*** technical support.

REFERENCE

1. Rosa Fraile, Vega and Gutierrez. (1980). Evaluation of Urea-Motility-Indole Medium for Recognition and Differentiation of Salmonella and Shigella Species in Stool Cultures.

2. Eder and Clark. (1970). Appl. Microbiol. 2:849.

3. Oberhofer and Hajkowski. 81970). Am. J. Clin. Pathol. 54:720

4. MacFaddin. (2000). Biochemical tests for identification of medical bacteria, 3rd ed. Lippincott Williams & Wilkins, Baltimore, Md.

5. Journal of Clinical Microbiology, Sept. (1980), p. 310-313

SYMBOLS IN PRODUCT LABELLING

IVD	For in-vitro diagnostic use	Σ	Number of <n> test in the pack
LOT	Batch Code/Lot number		Caution
REF	Catalogue Number		Do not use if package is damaged
	Temperature Limitation		Consult Instruction for use
	Expiration Date		
	Manufactured by		