PRODUCT INFORMATION

Product Type: Tubes

Cat No. TT039 Kligler Iron Agar (Lac, Glu, Gas, H_2S)

Intended Use:

Differentiation of Enterobacteriaceae. Kligler Iron Agar is a differential medium for the identification of *Enterobacteriaceae* from clinical and nonclinical samples based on dextrose and lactose fermentation as well as hydrogen sulphide production. Kligler Iron Agar based on the original medium [1,2,3] combines the principles of Russell [4], double sugar agar, with ferric citrate as an indicator to detect hydrogen sulphide production. Kligler Iron Agar is used in a diagnostic workflow to aid clinicians in determining potential treatment options for patients suspected of having bacterial infections. The medium is recommended for the identification of colonies picked off from plating media such as MacConkey Agar, Bismuth Sulphite Agar, or Desoxycholate Citrate Agar, etc.

Principles and uses:

Members of the *Enterobacteriaceae* include *Escherichia coli, Proteus mirabilis, Salmonella typhimurium and Shigella flexneri. Enterobacteriaceae* are Gram-negative, straight rods that do not sporulate. Except for *Tatumella, Shigella,* and *Klebsiella* species, which are non-motile, some genera are motile via peritrichous flagella. Enterococci can grow and survive in harsh conditions, they can be found in the gastrointestinal tract of humans and animals, plants, soil, water, environment and fermented products[1].

Technique

Smear the surface of a Kligler Iron Agar slope and stab the butt with a colony picked off one of the solid media.
There are three reactions to record when interpreting a KIA tube:

1. **Carbohydrate utilization:**

(i) slant reaction	(ii) butt reaction
acidity: yellow colour	acidity: yellow colour
alkalinity: red colour	alkalinity: red colour

2. **Gas production:**

aerogenic	an aerogenic
bubbles or splitting of agar	no gas production

3. **H_2S production:**

blackening in whole or part of butt: -
Record the slant reaction/the butt reaction/gas production/H2S production; in that order
Red slant/yellow butt - glucose only fermented
Yellow slant/yellow butt - glucose + lactose fermented
Red slant/red butt - neither glucose nor lactose fermented

Reactions after 18 - 24 hours at 35°C:

Organism	Slope	Butt	Gas	H_2S
Shigella sonnei	Red	Yellow	-	-
Shigella dysenteriae	Red	Yellow	-	-
Salmonella typhi	Red	Yellow	-	+
Salmonella species	Red	Yellow	+	+
Enterobacter species	Red	Yellow	+	-
Klebsiella species	Yellow	Yellow	+	-
Escherichia coli	Yellow	Yellow	+	-
Proteus mirabilis	Red	Yellow	-	+
Morganella species	Red	Yellow	V	-
Citrobacter freundii	Yellow	Yellow	+	+
Yersinia species	Red	Yellow	V	-

V = variable, + = positive, - = negative.

References

1. Kligler I. J. (1917) Am. J. Pub. Hlth 7. 1042-1044.
2. Kligler I. J. (1918) J. Exper. Med. 28. 319-322.
3. Bailey Sadie F. and Lacey G. R. (1927) J. Bact. 13. 182-189.
4. Russell F. F. (1911) J. Med. Res. 25. 217-229.

Composition g/L

'Lab-Lemco' (refined meat extract) powder	3.0 g/L
Yeast extract	3.0 g/L
Peptone	20.0 g/L
Sodium chloride	5.0 g/L
Lactose	10.0 g/L
Glucose	1.0 g/L
Iron (III) citrate	0.3 g/L
Sodium thiosulphate	0.3 g/L
Phenol red	0.05 g/L
Agar	12.0 g/L

Storage: 15-25°C
pH Range: 7.1 - 7.5
Appearance: Prepared medium: Red colored gel

Package contents: 20 Tubes
Exp. Date: Printed on label and on the item.
Required materials not supplied: Laboratory equipment as required.

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Version Number: 01

Warning and Precautions:

Warning and Precautions - For professional use only. Follow good microbiological lab practices while handling specimens and culture. Do not use Tubes if they show evidence of microbial contamination, discoloration, drying, cracking, or other signs of deterioration. Avoid freezing and overheating. The Tubes may be used / inoculated up to the expiration date and incubated for the recommended incubation times. After use and prior to discarding, specimen containers and all contaminated material, including the used culture media and contaminated culture containers, must be sterilized or incinerated by validated procedures. Since the nutritional requirements of organisms vary, some strains may be encountered that fail to grow or grow poorly on this medium.

Waste Disposal

After interpretation all items should be destroyed by standard incineration methods.

Performance Testing Results

MICROORGANISM	ATCC	Incubation Temp.(℃)	Incubation Cond.	Reaction 1	BUTT	GAS	H2S	SLANT
Escherichia coli	25922	33-37 ℃	Aerobic, 24 hours	Growth	A	+	-	A
Klebsiella pneumoniae	13883	33-37 ℃	Aerobic, 24 hours	Growth	A	+	-	A
Enterobacter aerogenes	13048	33-37 ℃	Aerobic, 24 hours	Growth	A	+	-	A
Proteus mirabilis	4630	33-37 ℃	Aerobic, 24 hours	Growth	A	-	+	K
Proteus vulgaris	33420	33-37 ℃	Aerobic, 24 hours	Growth	A	-	+	K
Salmonella typhimurium	14028	33-37 ℃	Aerobic, 24 hours	Growth	A	+	+	K
Shigella flexneri type 29	29903	33-37 ℃	Aerobic, 24 hours	Growth	A	-	-	K
Yersinia enterocolitica	9610	33-37 ℃	Aerobic, 24 hours	Growth	A	-	-	K

A = acid = yellow color

K = alkaline = pink red color

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