Biochemical Tests for the Identification of Bacteria (Enterobacteriaceae)
Carbohydrate Fermentation

UC    No Ferm    Ferm    Ferm+Gas
Triple Sugar Iron
• From left to right:

A. Uninoculated control
B. Red slant and red butt, no black color = no fermentation of glucose, sucrose or lactose. No Hydrogen sulfide produced
C. Red slant and black butt = no lactose or sucrose fermentation, \( \text{H}_2\text{S} \) has been produced
D. Red slant with yellow butt = no lactose or sucrose fermentation, glucose is fermented, no \( \text{H}_2\text{S} \) has been produced
E. Yellow slant, yellow butt and black coloration = Lactose, sucrose and glucose fermented, and \( \text{H}_2\text{S} \) has been produced
F. Yellow slant, yellow butt and lifting and/or cracking of media, no black coloration = Lactose, sucrose and glucose fermented, \( \text{H}_2\text{S} \) has not been produced but gas has been produced
G. Yellow slant, yellow butt and no lifting and/or cracking of media, no black coloration = Lactose, sucrose and glucose fermented, \( \text{H}_2\text{S} \) has not been produced nor has gas been produced
Indole

Add Kovac’s Reagent

Positive     Negative
Sulfide Indole Motility (SIM)

1. S (-)  
   I (-)  
   M(-)

2. S (-)  
   I (+)  
   M(-)

3. S (-)  
   I (-)  
   M(+)

4. S (+)  
   I (-)  
   M(+)

1  2  3  4
Simmon’s Citrate

Negative    Positive
Urease

Pos  Neg  UC
Phenylalanine Deaminase (PAD)

Add Ferric Chloride

Positive

Negative
Lysine Decarboxylase

Non-Enteric  Positive  Negative
Motility Indole Ornithine (MIO)

Add Kovac’s Reagent

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MR-VP

Add Methyl Red

Add Alpha-naphthol and KOH
Starch Hydrolysis

Add Iodine

Negative Positive

E. coli
Gelatinase

Positive

Negative
DNAse
Photo Credits

- web.fccj.edu/~lnorman/unknowns.htm?index=2
- inst.bact.wisc.edu/inst/index.php?module=Book
- http://www.austincc.edu/microbugz/gelatinase_test.php