Name: Amarachi Ngozi Joy
Level: 200L
Dept: Medical laboratory science
Matric No: 18/mhs06/016

MCB202 assignment

1) Explain (step-by-step) at least (10) biochemical reactions of bacteria.

Answer

Bacteria vary in their metabolic & enzymatic action used in identification of different genera & species of bacteria. Biochemical reactions are done on bacteria grown in pure culture.

Biochemical reactions

1) Sugar fermentation - Sugar
2) Oxidase test
3) catalase test
4) Coagulase test
5) API test,

1) Sugar fermentation - sugar media are composed of: peptone water, 1% test sugar, Andrade's indicator, A small inverted tube (Durham's tube) - Sugar fermentation can be indicated by change colour of ~~the~~ the medium from yellow to red.

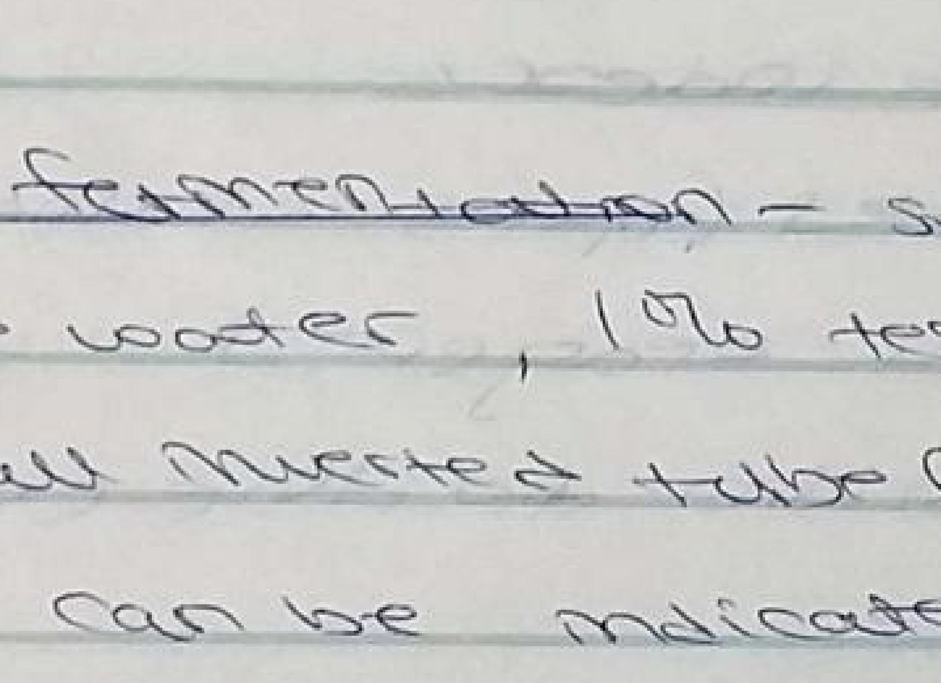
2) Catalase Test

Principle:

$$H_2O_2 \xrightarrow{\text{Catalase enzyme}} H_2O + O_2 \uparrow\uparrow$$

Air bubbles

Procedure:



Results: positive test: rapid appearance of gas bubb

3) Coagulase test

Principle:

Fibrinogen plasma $\xrightarrow{\text{Coagulase enzyme}}$ Fibrin visible clot

procedure:

12

11

1ml rabbit plasma

3 place at 37°c observe for formation of visible clot for upto 40 hrs.

4) Oxidase test:

Reagent: Tetramethyl p-phenylene diamine hydrochloride (oxidase reagent)

Colourless

↓ Cytochrome oxidase enzyme

Indophenol (purple colour)

within 1-2 min

5) API (Analytical Profile Index:

- Plastic strips with cupules (opens at the top)
- Inside cupules: media + reagent)
- Addition of test organism to the cupules

2) Explain the identification (Staining techniques of fungi:

a) Gram staining - It is a key staining point to identify microbial species. The main differentiates membrane structures between gram-positive and gram-negative microorganisms.

b) Giemsa staining - A variety of "Romanowsky-type" stains with mixtures of methylene blue and azure eosin compounds have been used successfully for many years on diverse fungi with various procedure and modifications.

c) Wright staining - The wright stain is an alcoholic

solution of methylene blue, Azure, A, thionin and con
1. methyl gours are activated and react with
charged components of the cell to produce colour.
It is used to detect blood parasites, viral and
chlamydial inclusion bodies, yeast cells, and species
of pneumocystis.

d) Acridine Orange staining - it is a fluorochromatic
dye that binds to nucleic acids of fungi. Under
UV light, acridine orange stains DNA and single-stranded
appears green - At neutral pH, fungi and cellular
materials stain reddish orange. At acid pH, fungi remain
reddish orange but background material stains greenish
yellow.

e) Gridley staining - is used to identify fungi based
on Bower Chromic acid leucofuchsin stain with
the addition of Gomori's aldehyde fuchsin stain
and metanil yellow as counterstains.