Slow growing mycobacterial species	Disease caused
M.kansaii	Infection of previously damaged lungs or infection in HIV patients
M.malmoense	Infection of previously damaged lungs and cervical adenitis
M.marinum	Fish-tank granuloma and swimming pool granuloma Resistant to INH and PZA
M.ulcerans	Progressive ulcerating skin lesions
M.gordonae	Resistant to INH and PZA
Rapid growing mycobacterial species	
M.fortuitum (saprophytes)	Soil organism that causes prosthetic joint abscesses, injection site abscess, and secondary pulmonary infection
M.chelonei (saprophyte)	Wound infections
M.flavescens	Rarely pathogenic
M.smegmatis-phlei	Found in urine and smegma but have no clinical significance

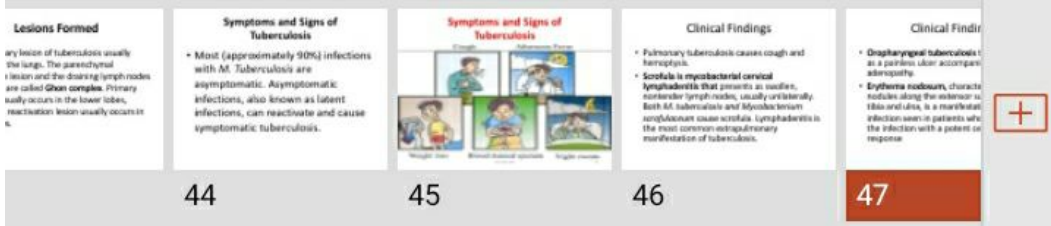
Differences Between Primary and Secondary TB

Primary tuberculosis	Secondary tuberculosis
Lesion in lower and middle lung lobes (base of lung)	Lesion in apex of lung lobes
Involvement of regional lymph nodes with caseation	Less marked regional lymphadenopathy
Cavitation rare	Cavitation prominent
Immune reaction not prompt	Prompt immune reaction is mounted
Occurs in persons with normal immunity	Occurs in patients with waning immunity

Clinical Findings

- **Oropharyngeal tuberculosis** typically presents as a painless ulcer accompanied by local adenopathy.
- **Erythema nodosum,** characterized by tender nodules along the extensor surfaces of the tibia and ulna, is a manifestation of primary infection seen in patients who are controlling the infection with a potent cell-mediated response

Notes Comments



Lesions Formed

- The primary lesion of tuberculosis usually occurs in the lungs. The parenchymal exudative lesion and the draining lymph nodes together are called **Ghon complex**. Primary lesions usually occurs in the lower lobes, where as reactivation lesion usually occurs in the apices.

imp Question

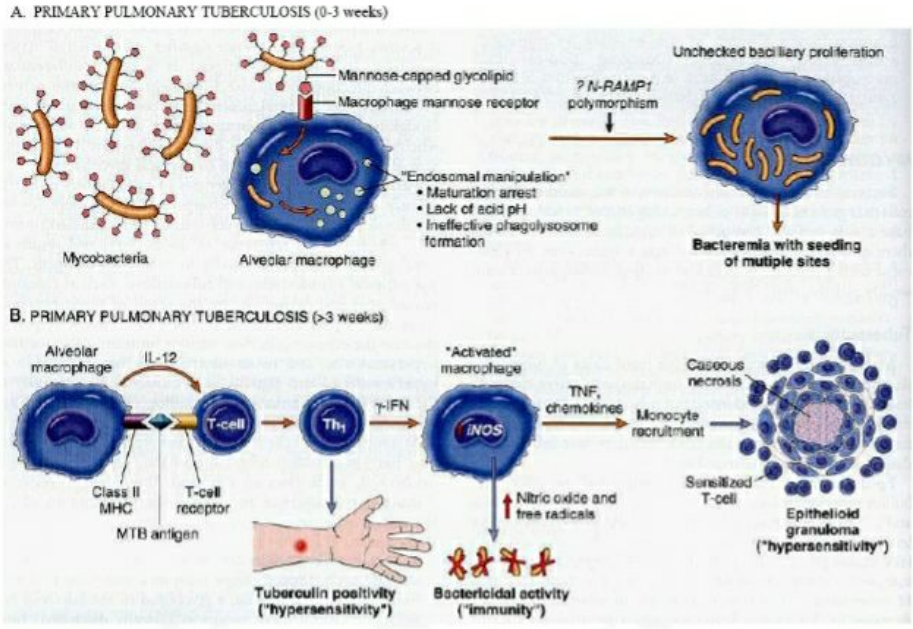
Types of tuberculosis

- **Primary tuberculosis**: is a form of disease that develops in a previously unexposed and therefore unsensitized person.
- **Secondary tuberculosis**: is the pattern of disease that arises in previously sensitized or infected host.

SEQ

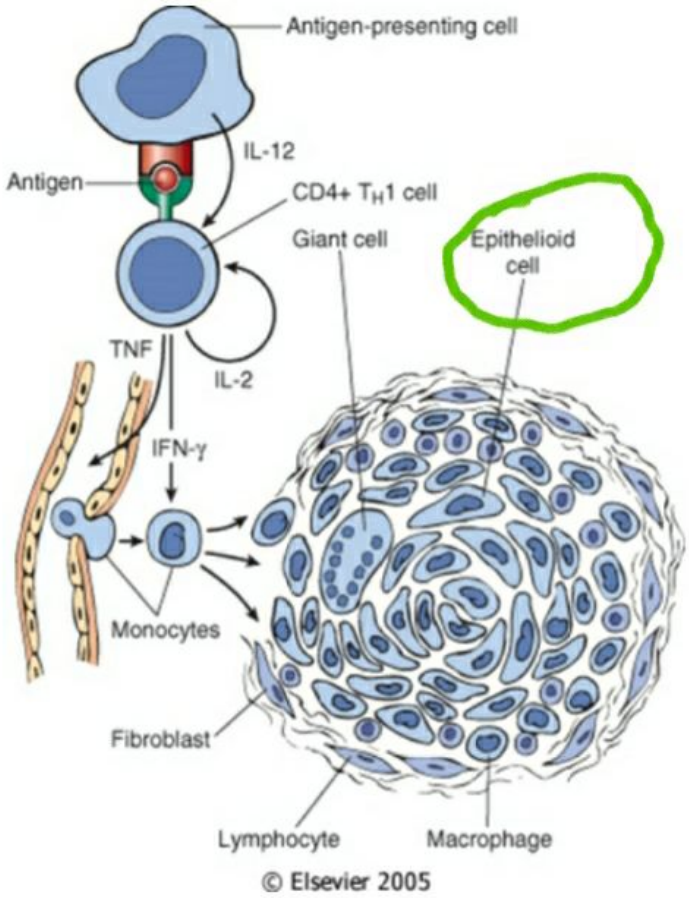
5 marks

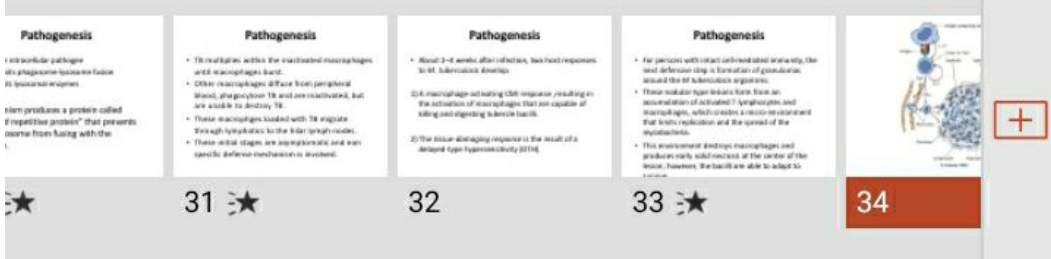
Pathogenesis



TB

Notes Comments





TB

SEQ

Pathogenesis

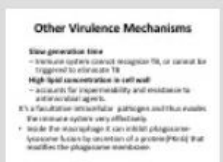
- **facultative intracellular pathogen**
  - **inhibits phagosome-lysosome fusion**
  - **resists lysosomal enzymes**

- The organism produces a protein called "exported repetitive protein" that prevents the phagosome from fusing with the lysosome.

Notes Comments

27

28



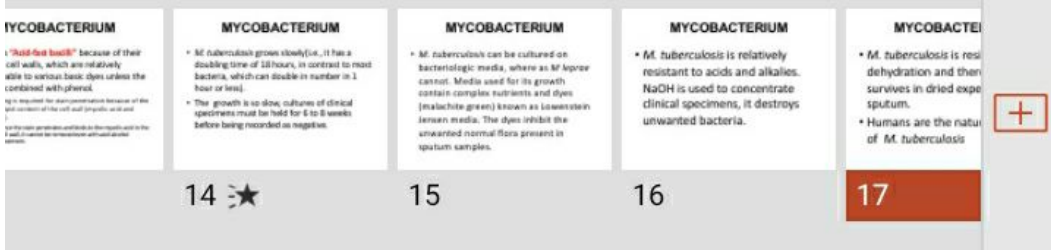
29 ★

30 ★

MYCOBACTERIUM

- *M. tuberculosis* is resistant to dehydration and therefore survives in dried expectorated sputum.
- Humans are the natural reservoir of *M. tuberculosis*

Notes Comments



safe and hygienic.

- **Specimens should not be collected from bed pans.**
- Vomitus not advised.

31

Enrichment Medium

- Enrichment of the fecal specimens are done on Alkaline peptone water
- Venkataraman Ramakrishan Meidum is simple medium can be used as transport medium

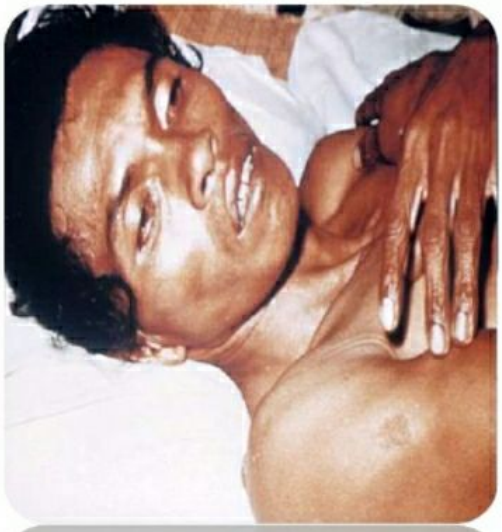
32

Selective Medium - TCBS

- V.cholrae grows well on Thiosulphate citrate bile sucrose (TCBS) agar, on which it produces yellow colonies that are readily visible against the dark green background of the agar.

33

- Diarrhea occurs as much as 20 – 30 Liters/Day fluids are lost.
- Results in dehydration
- Shock
- Acidosis
- Can lead to death.
- About 60% of infections are caused with classic V.cholrae and are asymptomatic, about 75% of infections are caused by El Tor biotype



Clinical features

- The incubation period is 1 – 4 days for person who develop symptoms, depends on the size of the inoculums ingested
- Manifest with

  Nausea , vomiting,

  profuse diarrhea, and abdominal cramps

  Rice water stool characteristic of cholera

  loss of fluid leads to profound dehydration

  Circulatory collapse and anuria.

Clinical Findings

- Watery diarrhea in large volumes is the hallmark of cholera. There are no red blood cells or white blood cells in the stool. **Rice-water stool is the term often applied to the** non-bloody effluent. There is no abdominal pain, and subsequent symptoms are referable

colonization, is related to secretion of the bacterial enzyme mucinase, which dissolves the protective glycoprotein coating over the intestinal cells.

16

Pathogenesis

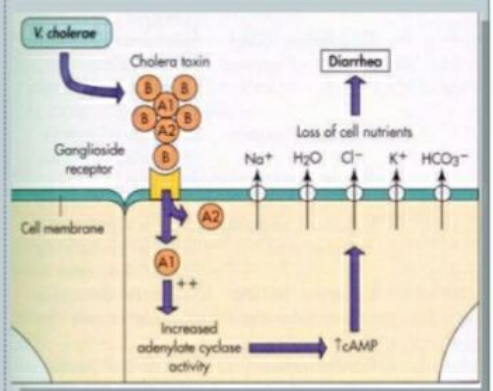
- After adhering, the organism multiplies and secretes an **enterotoxin called choleragen (cholera toxin). This exotoxin** can reproduce the symptoms of cholera even in the absence of the *Vibrio organisms.*

17

Pathogenesis

Vibrio Cholerae

- Vibrio Cholerae enterotoxin activates the stimulatory Gs protein via ADP-ribosylation. This stimulates secretion of chloride ions and water from enterocytes into the small intestines, and causing watery diarrhea.



18

3

Pathogenesis

- *V. cholerae is transmitted by* ***fecal contamination of water*** and food, primarily from human sources. Human carriers are frequently asymptomatic and include individuals who are either in the incubation period or convalescing. The main animal reservoirs are marine shellfish, such as shrimp and oysters. Ingestion of these without adequate cooking can transmit the disease.

4

Pathogenesis

- The pathogenesis of cholera is dependent on colonization of the small intestine by the organism and secretion of enterotoxin. For colonization to occur, large numbers of bacteria must be ingested because the organism is particularly sensitive [illegible] acid. Persons with little or no sto[illegible] ac[illegible] such as those taking antacids or those who

epidemic disease, where as non-O1 organisms either cause sporadic disease or are nonpathogens.

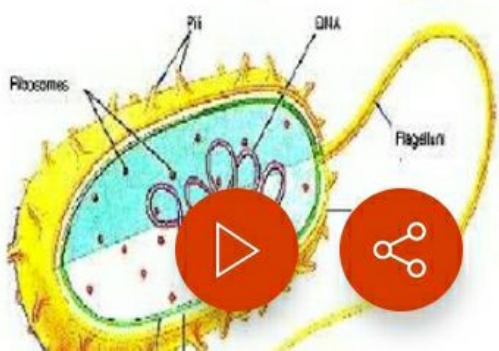
Important Properties

- The O1 organisms have two biotypes, called El Tor and Classic, and three serotypes, called Ogawa, Inaba, and Hikojima. (Biotypes are based on differences in biochemical reactions, whereas serotypes are based on antigenic differences). Sero-group O139 organisms, which caused a major epidemic in 1992, are identified by their reaction to antisera to the O139 polysaccharide antigens

V.cholrae - typing

- V.cholrae 01 has determinants that make possible futher typing
- Serotypes are Ogawa, Inaba and Hikojima.

Epidemic V.cholerae is



Serological diagnosis

- *Salmonella* isolate can be identified and grouped by the slide agglutination test into serogroup A, B, C, D based on its O antigen.

- Diagnosis can be made serologically by detecting a rise in antibody titer in the paired patient's serum (Widal test).

mcq

- "Fish-eye" growth (lactose non-fermenter with sulfur reduction) on DCA agar

Typhoid

Laboratory Diagnosis

- **Samples**

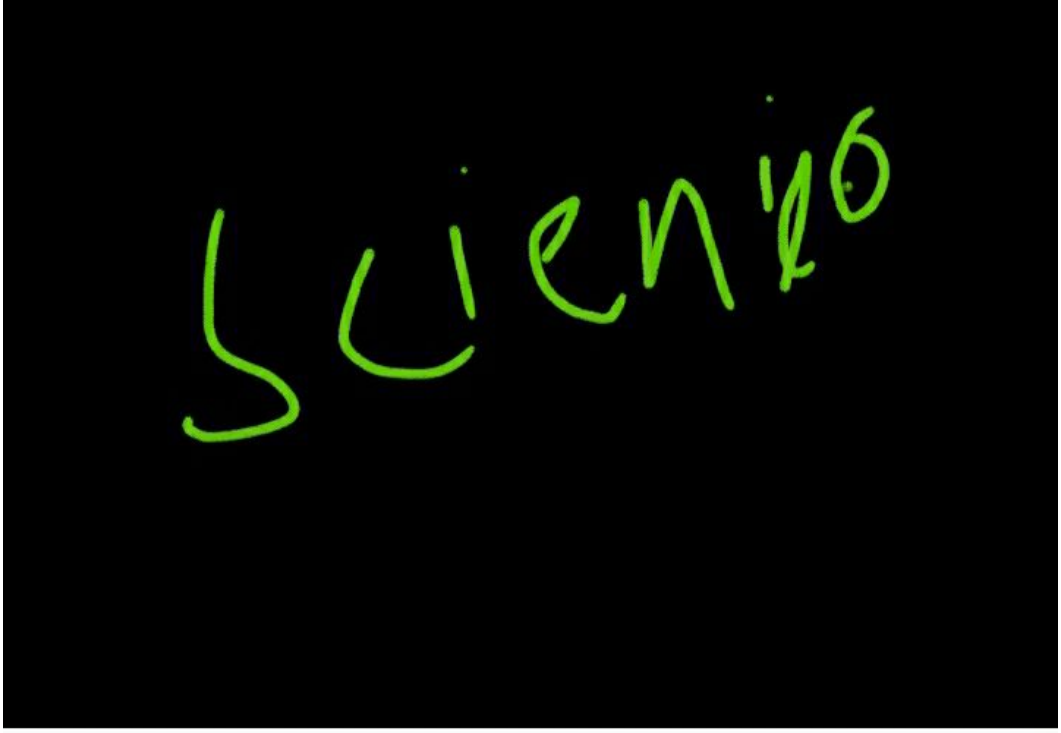
- 1. Enterocolitis ------- stool
- 2. Typhoid fever------- first week -------- blood
- second week------stool
- third week -------- urine
- chronic carriers---stool

Thyphoid marry?

How is it spread?

- Ingestion of food and water contaminated by human and animal wastes.
- *S. typhi*, the cause of typhoid fever, is transmitted only by humans, but all other species have a significant animal as well as human reservoir.
- The most frequent animal source is poultry and eggs, but meat products that are inadequately cooked are also the cause.

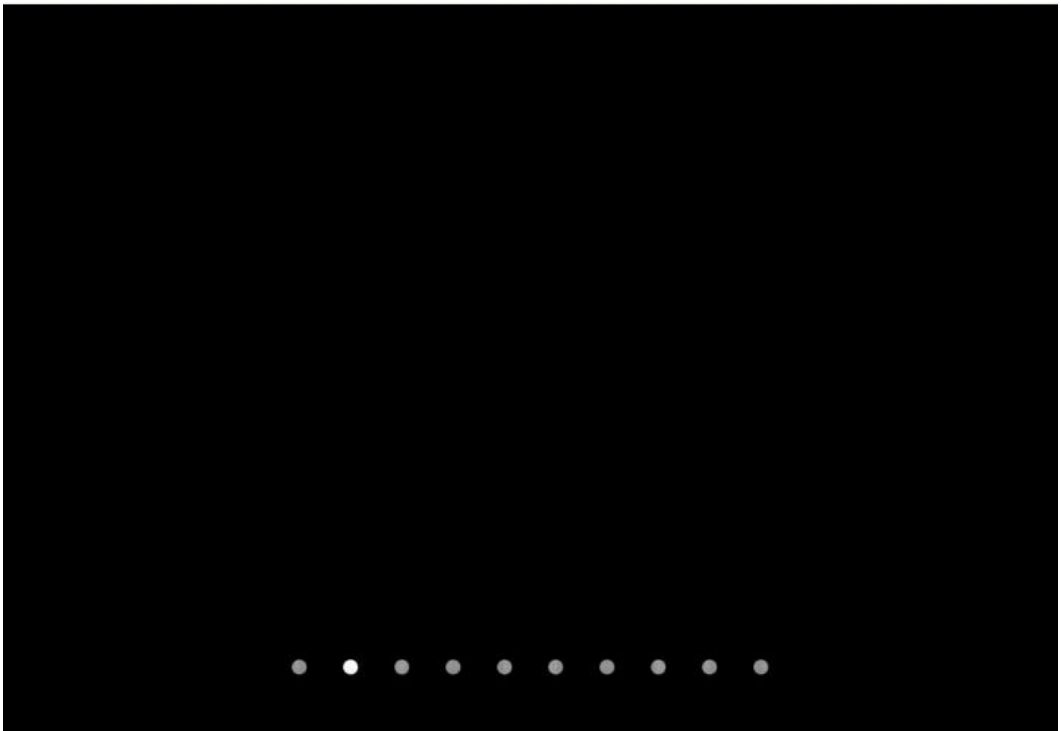
Virus Ques



4) Enterohemorrhagic *E. coli* (EHEC)

- Represented by a single strain (**serotype O157:H7**) produces shiga like toxin.

- Copious bloody discharge (hemorrhagic colitis), intense inflammatory response, may be complicated by hemolytic uremic syndrome.



Introduction

- *E. coli* is a most abundant facultative anaerobe in colon and feces.
- It is the most common cause of urinary tract infection.
- It is most important cause of neonatal meningitis.
- The agent most frequently associated with "travelers diarrhea"
- Some strains cause bloody diarrhea.

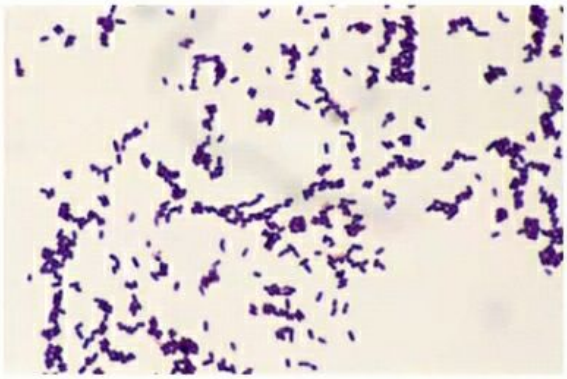
REC

21. corynebacterium & listeria - Microsoft PowerPoint

View EndNote X7

Laboratory diagnosis

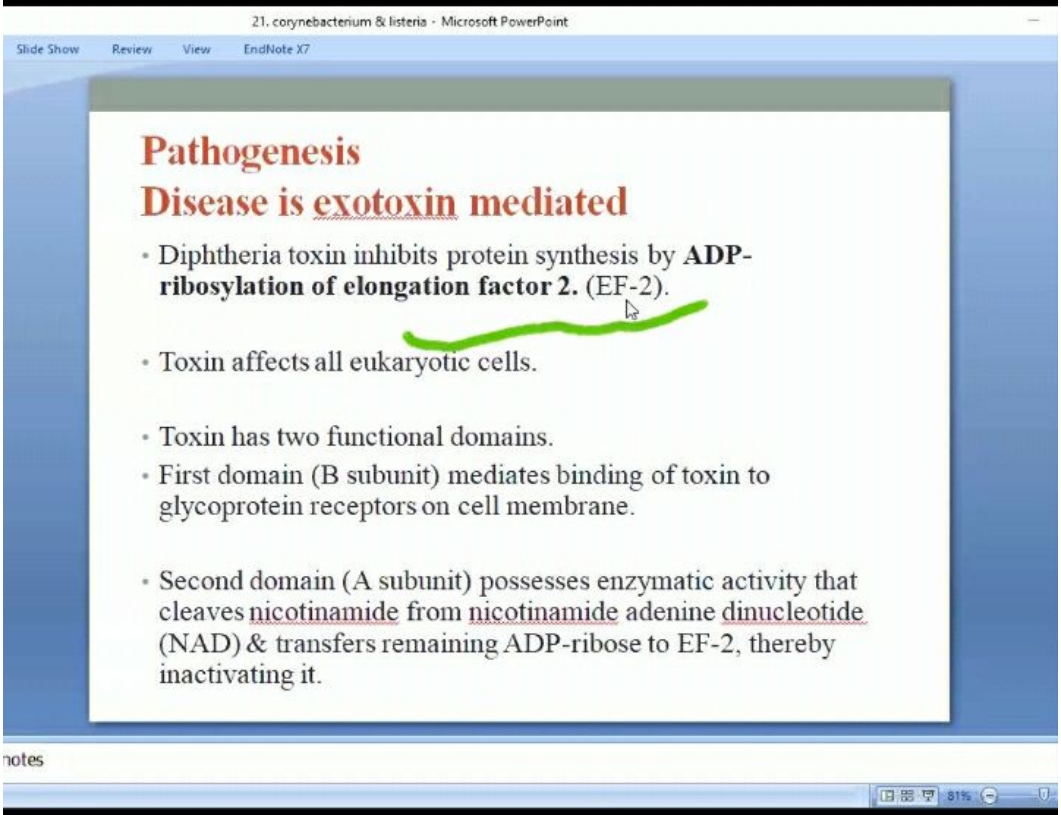
- **Gram stain:** Small **Gram-positive rods** arranged in V- or L-shaped forms similar to *Corynebacteria* & diphtheroids.



- **Motility Test: Tumbling** movement distinguishes it from *Corynebacteria* (non-motile).

Prof Dr Mulazim Hussain Bukhari Community Medicine / Medi...


REC

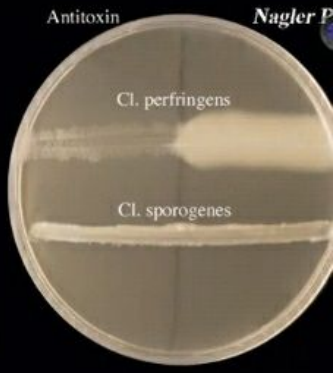

21. corynebacterium & listeria - Microsoft PowerPoint
Slide Show
Review
View
EndNote X7
Pathogenesis
Disease is exotoxin mediated
• Diphtheria toxin inhibits protein synthesis by ADP-ribosylation of elongation factor 2. (EF-2).
• Toxin affects all eukaryotic cells.
• Toxin has two functional domains.
• First domain (B subunit) mediates binding of toxin to glycoprotein receptors on cell membrane.
• Second domain (A subunit) possesses enzymatic activity that cleaves nicotinamide from nicotinamide adenine dinucleotide (NAD) & transfers remaining ADP-ribose to EF-2, thereby inactivating it.
notes
81%

REC

ajpe

Nagler's Reaction:

- Egg yolk agar used to demonstrate the presence of lecithinase.



- **Nagler's reaction:**
- **C. perfringens produces an opacity in medium containing lecithin due to lecithinase C activity (alpha toxin).**
- **This opacity inhibited by applying specific antitoxic serum to medium which inactivate s lecithinase.**
- **Technique referred as Nagler reaction**

REC

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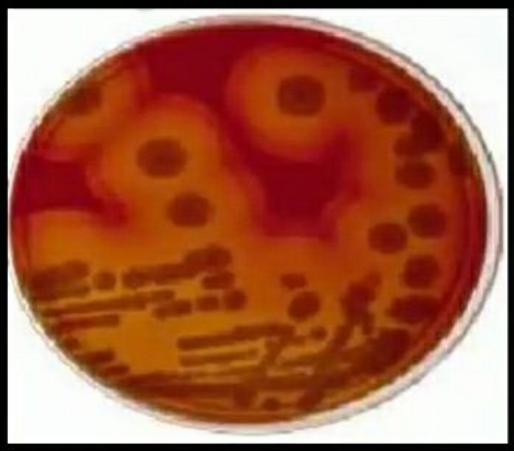
Culture & Sensitivity:

- Blood agar: Large beta-haemolytic colonies produced (most food-poisoning strains are non-haemolytic).
- Some strains produce a double zone of haemolysis.



REC

Open MCQ

Clostridium perfringens: cause

Gas gangrene & Food poisoning

1. **Gas Gangrene: (myonecrosis, necrotizing fasciitis)**
   - Associated with war wounds, automobile, motorcycle accidents & septic abortions (endometritis).

2. Food Poisoning: Spores located in **soil,** contaminate **food.** The heat-resistant spores survive cooking & germinate.

viva

Special forms

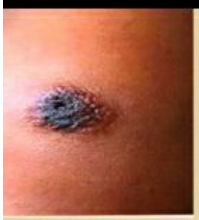
- **Wound botulism:**
- Spores contaminate wound, germinate & produce toxin at the site. Wound botulism associated with drug abuse (skin-popping with black tar heroin).
- **Infant botulism:**
- Organisms grow in gut & produce toxin there.
- Ingestion of honey containing organism implicated in transmission of infant botulism.
- Affected infants develop weakness or paralysis & need respiratory support.

From Ali Ihtashaam F17-136 to Everyone

F17-136

Clinical findings

- Descending weakness & paralysis (flaccid paralysis), including diplopia, dysphagia, and respiratory muscle failure, are seen.
- No fever is present.
- In contrast, Guillain-Barré syndrome is an ascending paralysis



Clinical Findings

- **Cutaneous anthrax:** Painless ulcer with a black eschar (crust, scab), local edema (**malignant pustule).** Untreated cases progress to bacteremia and death.
- **Pulmonary anthrax** (woolsorter's disease): influenza like symptoms, dry cough & substernal pressure, progressing to hemorrhagic mediastinitis, bloody pleural effusions, septic shock & death.
- **Gastrointestinal anthrax: V**omiting, abdominal pain & bloody diarrhea.

Pathogenesis

Bacillus anthracis has two exotoxins

Edema factor | **lethal factor**

- Each consist of two proteins having A–B subunits.
- B (binding subunit) in each of two exotoxins: **Protective antigen:** forms pores in human cell membrane, allows edema factor and lethal factor to enter cell.
- A (active subunit): enzymatic activity.

Adenylate cyclase (Increases intracellular concentration of cyclic AMP, causing outpouring of fluid from cell into extracellular space causing edema.

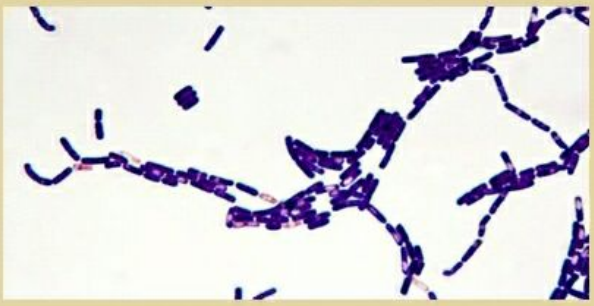
Protease (cleaves phosphokinase that activates MAPK signal transduction pathway, controls growth of human cells.

REC

mcq

Important Properties

- Large Gram-positive rod with square ends, frequently found in chains.
- Anti-phagocytic capsule (**D-glutamate).**
- Non-motile.



other capsule is made up of peptides

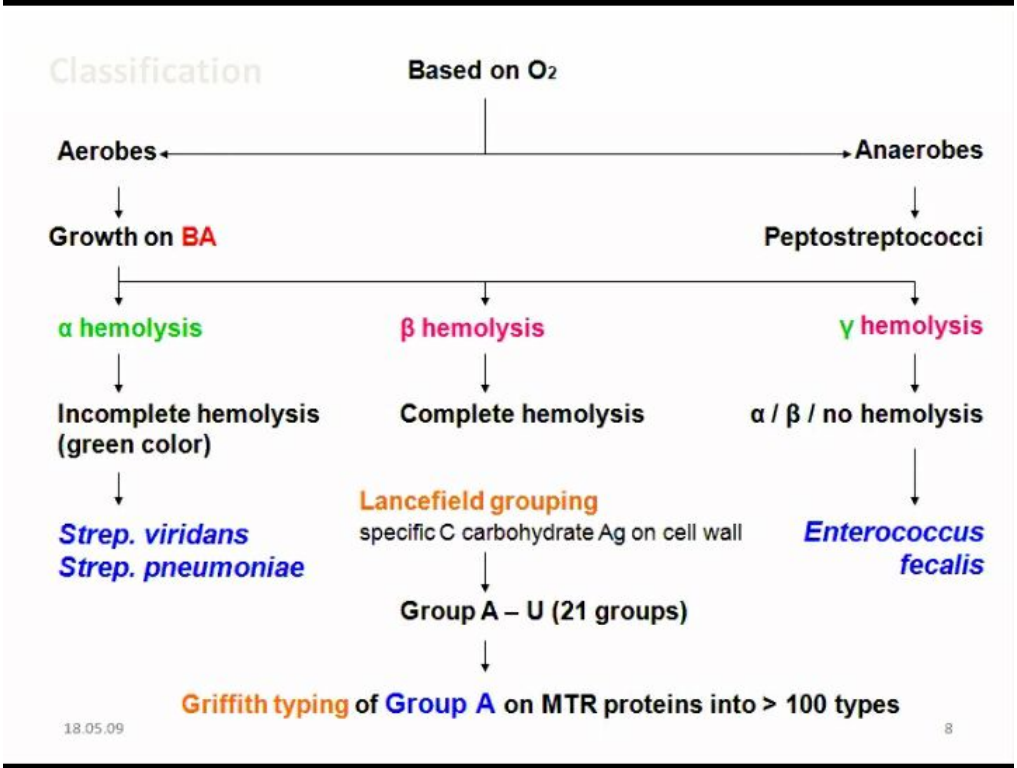
REC

Biological weapon

1.Bacillus anthracis cause Anthrax

- Primarily a disease of herbivores (goat, sheep, cattle, horses).
- Humans infected incidentally by contact with infected animals, their products.
- **Bioterrorism In 2001**: outbreak of both inhalational & cutaneous anthrax in United States.
- Caused by sending spores of organism through mail.
- 18 cases, **5 died.**

mcq 1



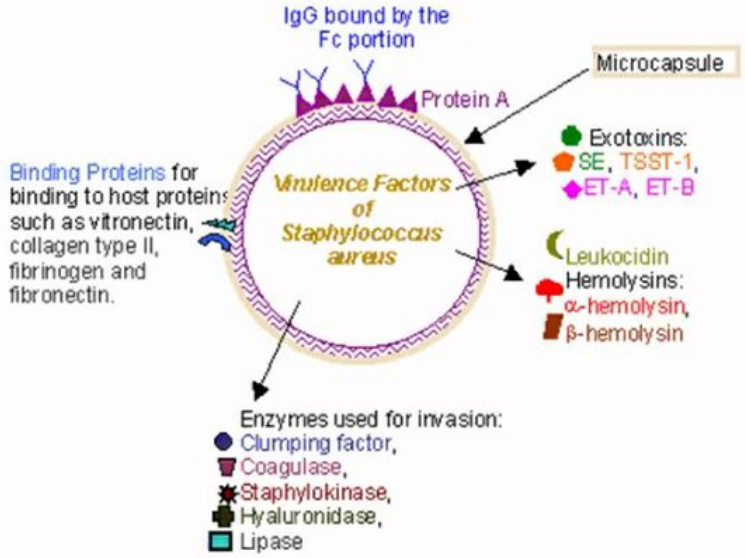
Classification of Streptococci Based on Hemolysis on Blood Agar

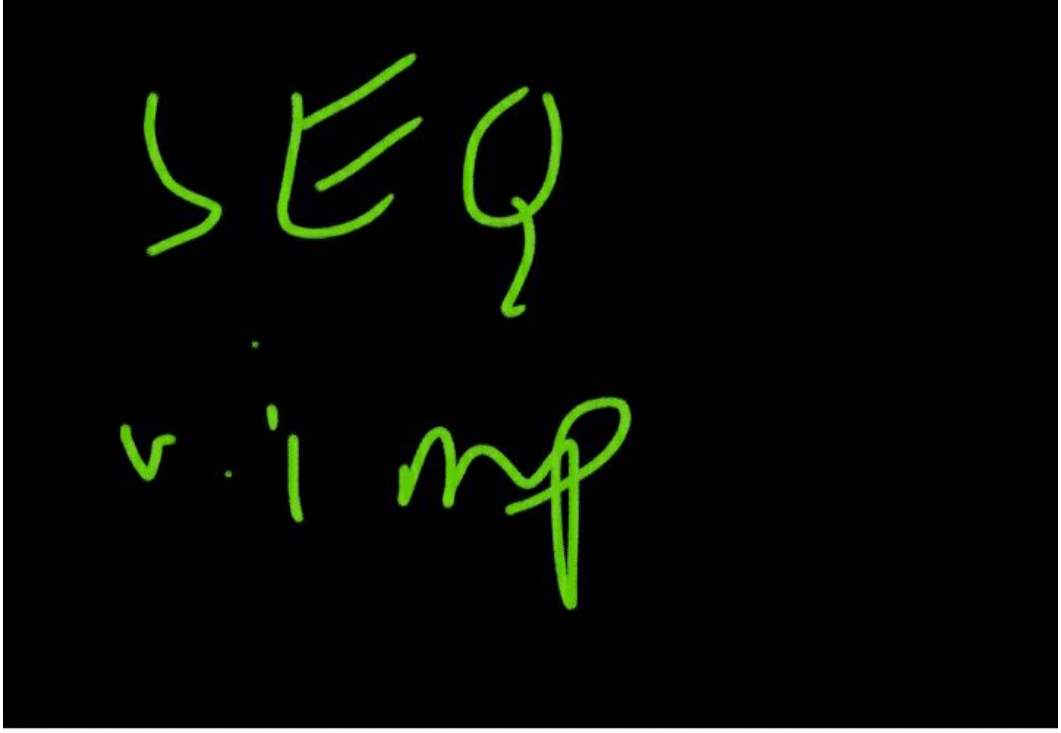
- Hemolysis on BA
  - α-hemolysis
    - Partial hemolysis
    - Green discoloration around the colonies
    - e.g. non-groupable streptococci (*S. pneumoniae* & *S. viridans*)
  - β-hemolysis
    - Complete hemolysis
    - Clear zone of hemolysis around the colonies
    - e.g. Group A & B (*S. pyogenes* & *S. agalactiae*)
  - γ-hemolysis
    - No lysis
    - e.g. Group D (*Enterococcus spp*)

Virulence Factors: Extracellular TOXINS

- Several important toxins are produced by *S. aureus.*
- The three clinically important are enterotoxin, toxic shock syndrome toxin and exfoliatin.

Virulence factors of Staphylococcus aureus





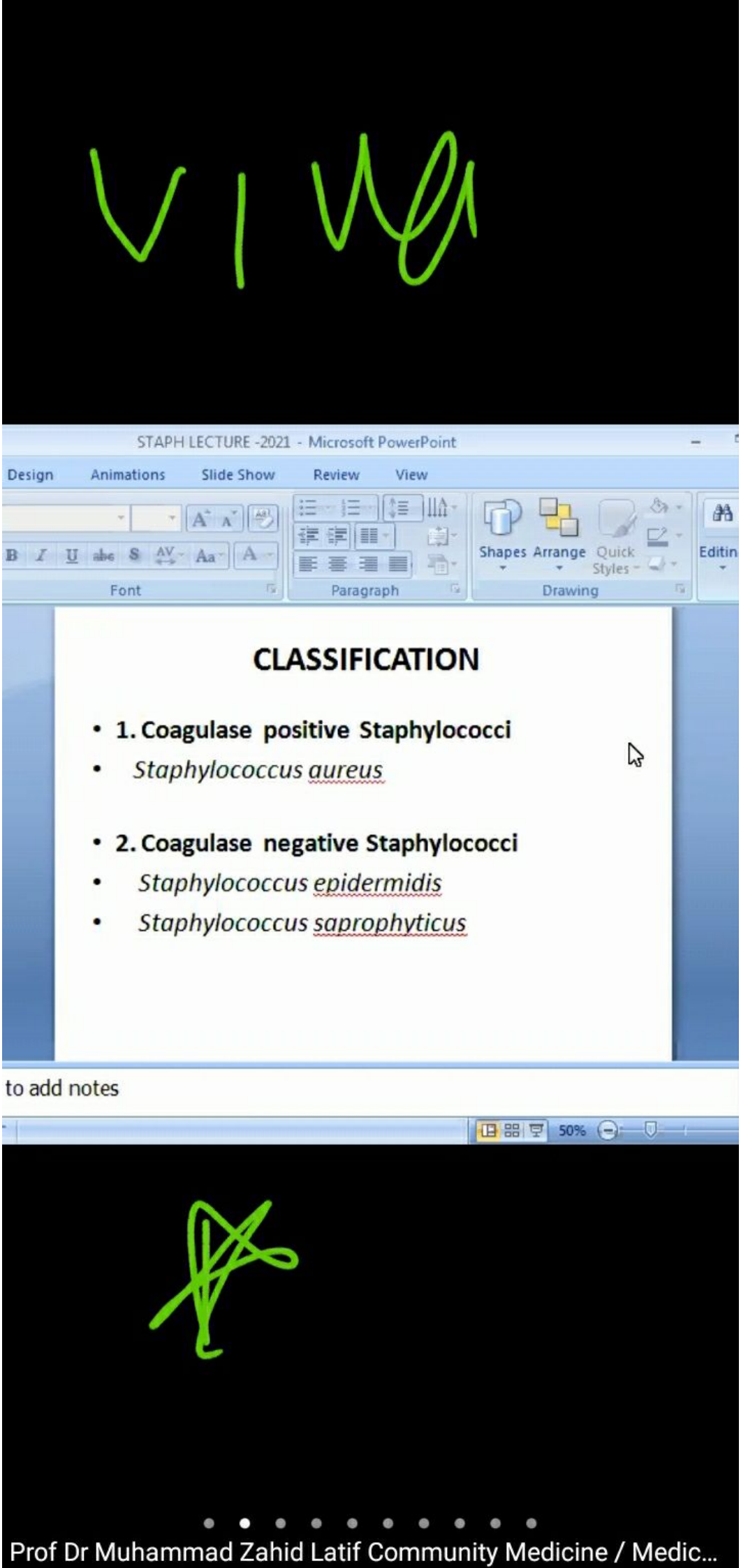
Virulence factors:

These include

A- Cell wall associated factors

B- Extracellular factors

- Enzymes
- Toxins


STAPH LECTURE -2021 - Microsoft PowerPoint
Design
Animations
Slide Show
Review
View
Font
Paragraph
Shapes
Arrange
Quick Styles
Drawing
CLASSIFICATION
1. Coagulase positive Staphylococci
Staphylococcus aureus
2. Coagulase negative Staphylococci
Staphylococcus epidermidis
Staphylococcus saprophyticus
to add notes
50%
Prof Dr Muhammad Zahid Latif Community Medicine / Medic...

STAPH LECTURE -2021 - Microsoft PowerPoint

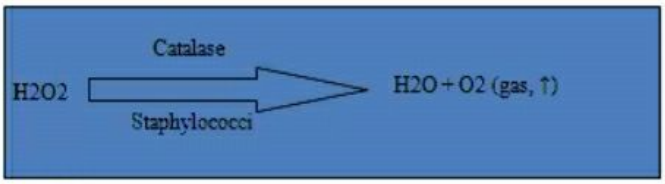
Design Animations Slide Show Review View

Font Paragraph Drawing

Shapes Arrange Quick Styles

Catalase test

- The catalase test is use to distinguish Streptococci from Staphylococci.



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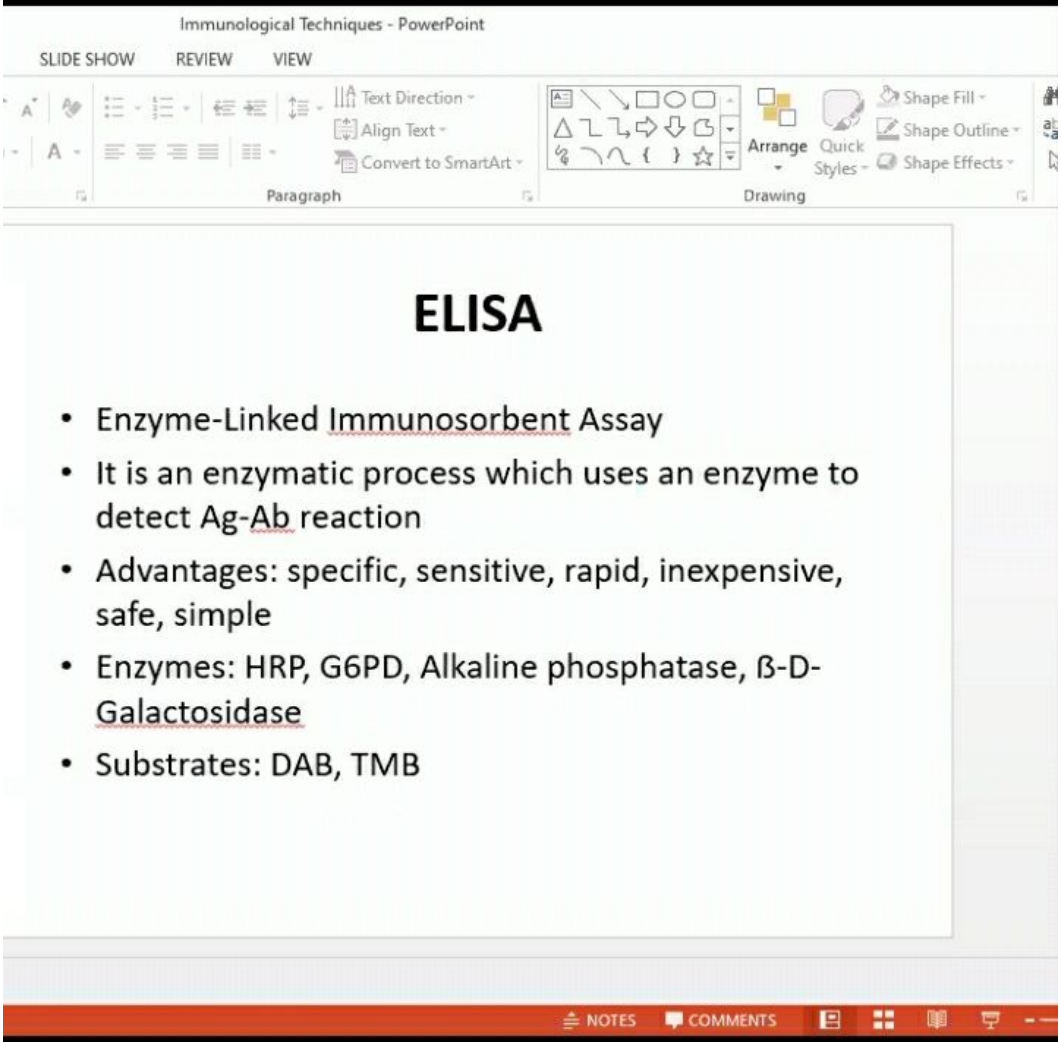
Nomenclature of Cytokines

- Monokines – produced by mononuclear phagocytes.
- Lymphokines – produced by activated T cells, primarily helper T cell.
- Interleukins - cytokines made by one leukocyte and acting on other leukocytes.
- Chemokines- cytokines with chemotactic activities.
- Interferons - involved in antiviral responses.

Ospe


Immunological Techniques - PowerPoint
SLIDE SHOW
REVIEW
VIEW
Text Direction
Align Text
Convert to SmartArt
Paragraph
Arrange
Quick Styles
Shape Fill
Shape Outline
Shape Effects
Drawing
ELISA
• Enzyme-Linked Immunosorbent Assay
• It is an enzymatic process which uses an enzyme to detect Ag-Ab reaction
• Advantages: specific, sensitive, rapid, inexpensive, safe, simple
• Enzymes: HRP, G6PD, Alkaline phosphatase, ß-D-Galactosidase
• Substrates: DAB, TMB
NOTES
COMMENTS

Tolerance and Autoimmunity - PowerPoint

IMATIONS SLIDE SHOW REVIEW VIEW

Text Direction
Align Text
Convert to SmartArt
Paragraph
Arrange
Quick Styles
Shape Fill
Shape Outline
Shape Effects
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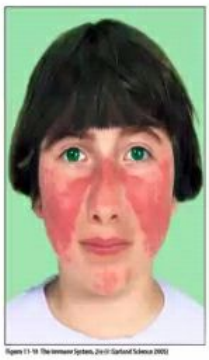
Editing

SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)

- Chronic, multi-system inflammatory disease with protean manifestations and remitting course
- Clinical manifestations
  - Musculoskeletal (joint and muscle pain)
  - Dermatological (malar rash)
  - Renal (glomerulonephritis)
- Female to male ratio of 9:1
- Etiology is unknown
  - Genetics, race, hormones, environment



NOTES COMMENTS