



Microbiology

Subject :

Lec no : 10

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وَقَالَ رَبِّ زِدْنِي عِلْمًا

تجدون في guidance مادة المايكرو على موقع النادي :

The screenshot shows the website medclubhu.weebly.com with the following content:

- Navigation: كتاب المادة, كورسات المايكرو, الفريق العلمي, مصادر المادة, مكتبة المادة
- التقارير: BARJES NOTES-VEIN, ATHAR NOTES
- شرح المادة: SCIENTIFIC TEAM - MICRO, SCIENTIFIC TEAM - VIROLOGY
- Footer: powered by weebly
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- شرح دكتور اشرف ثارة الفيروسات: VIROLOGY
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- osmosis
- مصادر مجانية تلمذ بوتيوب: DR. SALEH BAHAJ
- الدكتورة نوى شرحها تمام شرح وكثرة هناك شرح: DR. NOHA MADROULY

قاريغ برجس جدا!!!!!! قوية ، سفا!!!!!!حة

شرح للفريق العلمي

للوصول الى guidance المايكرو و تفاريغ
المادة كاملة :



كل اعمال الفريق العلمي تنشر على قناة
التليغرام



بتلاقو هون ملف سكتشي ، بدل
ما تحضروا الفيديوهات بتلاقوها
هون كتابة

8- Gram Negative Cocci

Neisseria

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Objectives

- Understand the morphology, epidemiology, pathogenesis, and laboratory diagnosis of *Neisseria gonorrhoeae*
- Understand the morphology, epidemiology, pathogenesis, and laboratory diagnosis of *Neisseria meningitides*

Introduction

Gram -ve cocci

- *Neisseria gonorrhoeae*
- *Neisseria meningitidis*
- *Moraxella catarrhalis* Less common
- Other *Neisseria* species (non-pathogenic)
N. cineria, *N. lactamica*, *N. polysaccharea*, *N. subflava*,
N. sicca, *N. mucosa*, *N. flavescens*

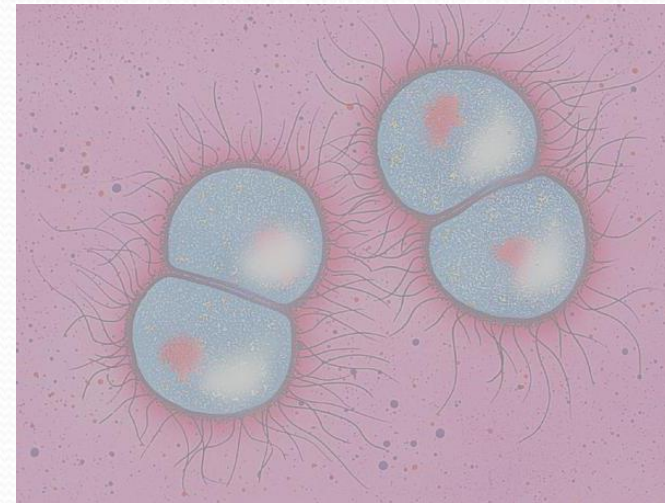
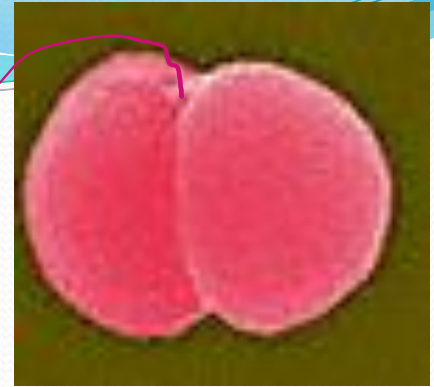
رح نحكي عن هذول بالتفصيل



Neisseria gonorrhoeae
(gonococcus)

General Characteristics

- Gram-negative cocci often arranged in pairs (diplococci) with adjacent sides flattened
- **Oxidase positive**
- **Most catalase positive**
- **Non-motile, non spore forming**
- Sensitive, aerobic but grow better with low CO₂ and susceptible to cool temperatures, drying and fatty acids



هناك عوامل كثير بتأثر عليها فدنا
نكون حذرين في اخذ العينة

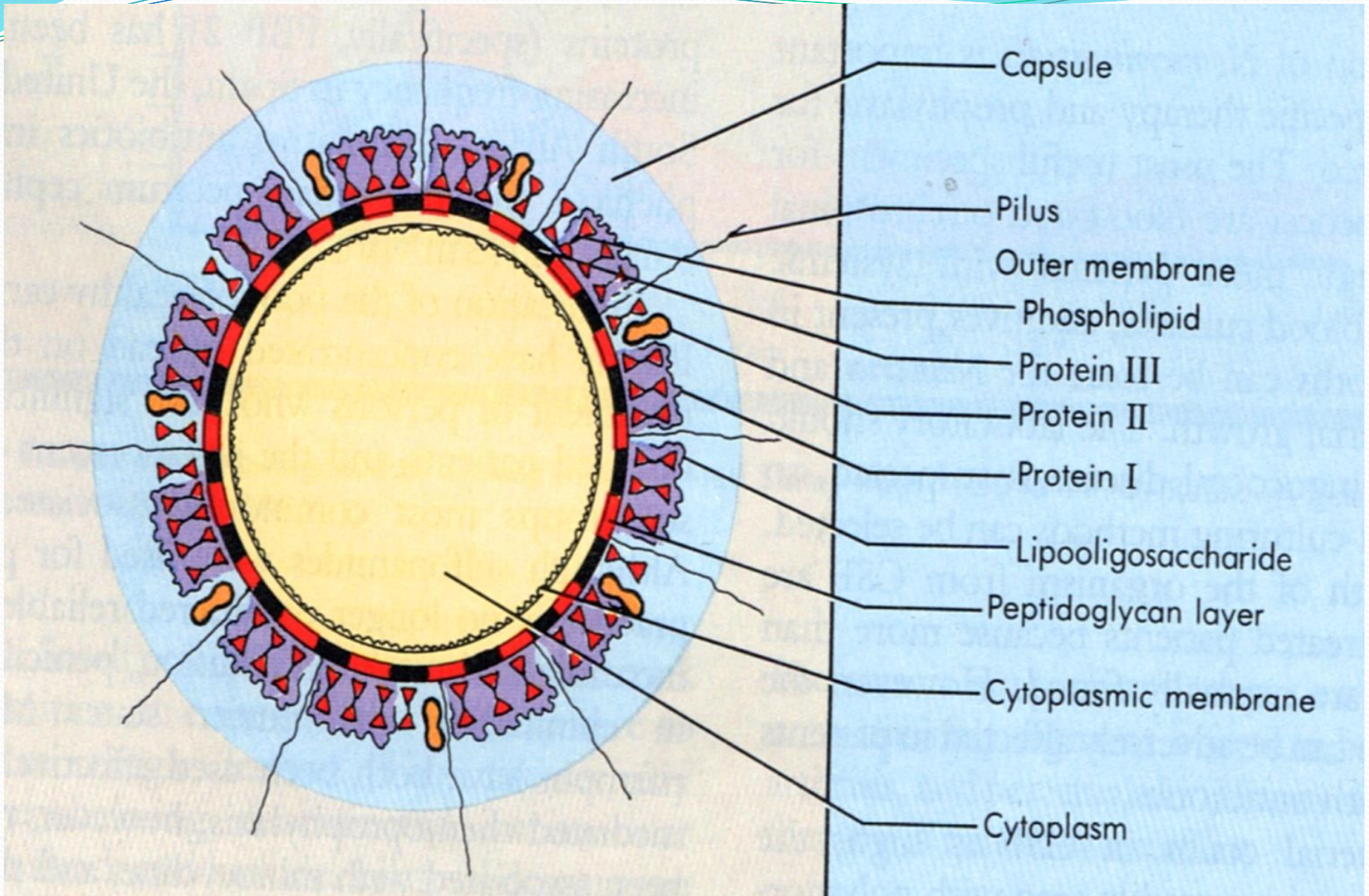
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Structure

للالتصاق مش الحركة

- Pili (N-methylphenylalanine)
- Outer membrane:
 1. Phospholipids
 2. Proteins: Outer membrane proteins (OMP I, OMP II, Opa)
Endotoxin
 3. Lipopolysaccharide (LPS) mainly as lipooligosaccharide (LOS)
- Antigenic variation: Pili, OMPs, LOS



Epidemiology

- *Neisseria gonorrhoeae* is a **common** source of infection in humans
- **Not part of normal human flora**, only found in mucous membranes of genitalia, anorectal area, oropharynx or conjunctiva during infection
- Transmission primarily by **sexual contact** or from infected **mother during birth**
- Asymptomatic carriage **is a major reservoir**
- Lack of protective immunity and therefore reinfection, partly due to **antigenic diversity of strains**

وين ما وجدت بكون الها infection حتى لوقاي اعراض

يكون مصاب بس ما عليه اعراض

ضد ما قابليه
صناعة الجسم

Pathogenesis

كيف يحدث؟

1. Attachment and invasion: pili and outer membrane protein help the bacteria to attach to intact mucus membrane epithelium. ^{تعلقوا / دخلوا} Invasion of submucosal eipthelial cells through parasite-directed endocytosis
2. Survival and multiplication in the submucosa, establish infection in the sub-epithelial layer
3. Spread and dissemination: The bacteria cause local cell injury and inflammatory response. Local spread to adjacent structures or systemic dissemination through blood (bacteremia)
- Most common sites of inoculation:
 - Cervix (cervicitis) or vagina in the female
 - Urethra (urethritis) or penis in the male

Virulence Factors

عوامل الضراية

جهاز المناعة ييفرز antibody من نوع IgA يكون موجود بال mucus membrane هاي البكتيريا عندها انزيم بتكسرو

- *N. gonorrhoea* secretes **IgA protease** that inhibit IgA antibodies function
- **Outer membrane proteins:**
 1. Prevents phagolysosome and promotes intracellular survival
 2. Mediates firm attachment to epithelial cells and subsequent invasion into cells
 3. Protects other surface antigens from bactericidal antibodies
- Lipooligosaccharide (LOS) (Lipid A) has **endotoxin** activity
- Acquisition of antibiotic resistance:
 1. Plasmid-encoded beta-lactamase production Resistant مجموعة كبيرة من ال antibiotic
 2. Chromosomally-mediated changes in cellular permeability inhibit entry of antibiotics تكون الجينات المسؤولة عن ال antibiotic Resistant بالاكروموسوم بدل البلازميد

Clinical Presentation

- **In Men:**

Urethritis: Most infections among men are acute and symptomatic with purulent discharge & dysuria (painful urination) after 2-5 day incubation period

يعني الاعراض بتبين بعد 2/5 من حضانه الباكثيريا

- **In women:**

Cervicitis: mild pain, discharge, dysurea but mostly asymptomatic

حمل خارج الرحم

Pelvic Inflammatory Disease: **ectopic pregnancy** and **infertility** (العقم)

Disseminated Gonococcal Infection: **bacteremia**

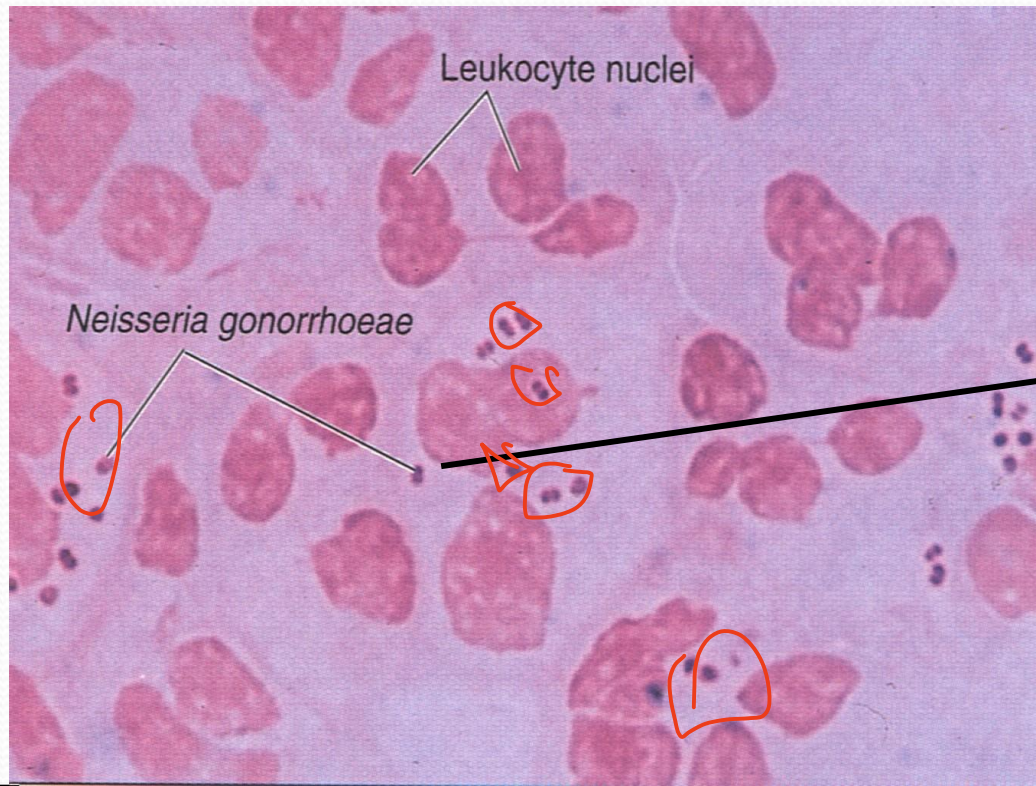
Laboratory Diagnosis

Specimen collection and transportation

- Specimens: **urethral discharge**, cervical swab, blood
- Should be processed immediately (**no more than 6 hours**)
↳ بعد 6 ساعات
- Do not expose to high temperature or dry conditions
- **Cotton swab** should include charcoal? **to inhibit fatty acid formation**
- Transport in media with **increased CO₂ using special packaged system** that contain CO₂ generation system

1. Gram Stain

- Gram -ve diplococci inside polymorphonuclear leukocytes
- **Gram stain: 95%** specific and sensitive in men, **50% - 70%** in women



2. Culture

Media:

- Thayer Marten Media (TM): Enriched chocolate agar with antimicrobial colistin (to inhibit G- bacilli) nystatin (to inhibit yeast) and vancomycin (to inhibit G+ bacteria) دم مغليا
 - Modified Thayer Marten Media (MTM): as above plus trimethoprim (to inhibit *proteus*) نفس ال media الي فوق بس اضافة trimethoprim
 - Martin Lewis medium (ML): same as above except that anisomycin is substituted for nystatin and vancomycin concentration is increased زاد تركيزه بدلها
- ٦٦٦

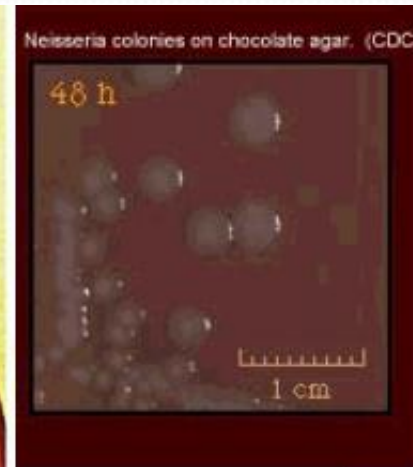
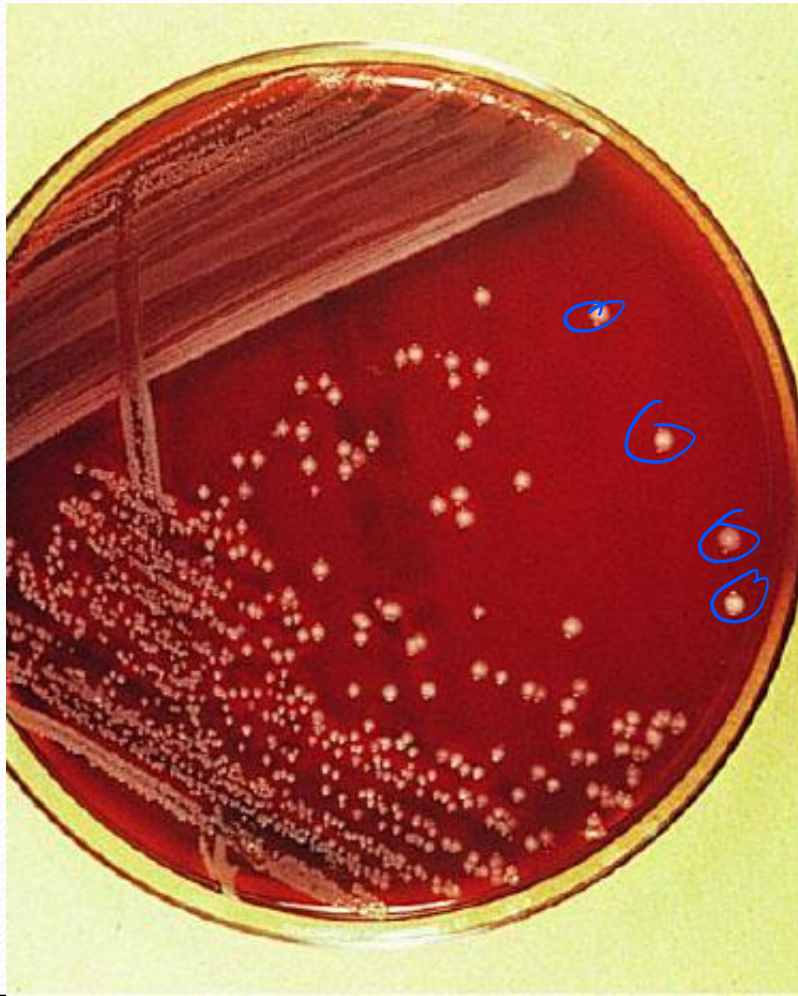
Incubation conditions:

- Prewarm the media
- Incubate at 35-37 °C for 73 hours
- CO₂ enriched ex candle jar (5-7%)
- Humid atmosphere ex sterile gauze pad soaked with sterile water in the bottom of candle jar

ما قبله
اللاب
dryness

Colonial appearance:

Small, grayish white, convex, translucent, shiny,
with smooth or irregular margins



3. Biochemical Tests

- Oxidase positive ✓
- Glucose fermentation positive (while maltose and lactose fermentation is negative)
- Nitrite reduction negative



4. Immunological Tests

- Commercially available particle agglutination tests using specific monoclonal antibodies are available and used mainly for confirmation of colony growth
- Immunological assays is less useful due to antigenic variations

5. Antimicrobial Susceptibility

Tests

- Resistance to penicillin is quite common due to production of beta-lactemase
- Resistance to ceftriaxone is not described هذا ال antibiotic قوي
- Treatment with ceftraxone is effective and does not require routine susceptibility testing



Thank you....