

***Sheet no. : 23***

***Refer to slide no. : 15***

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**#Chlamydia**

We have 3 types which cause diseases :

1. C.Trachomatis
* This may cause inflammation in the eye with trachoma which lead to blindess (very serious)
* Sexual transmitted disease
* Genital infection
* Pneumonia
1. C.pneumoniae
* Which cause upper respiratory tract infection and pneumonia
1. C.psittaci
* Which cause “psittacosis” disease , its affect people who care of parrots.
* Transmitted by birds feces and cause pneumonia .

**Chlamydia** are odd and different from all other bacteria, in fact they **are obligate intracellular parasites** , can’t live outside the cells or outside animals .

At beginning they thought its viruses but they are prober bacteria ( have DNA,RNA … )

* Related to Gram negative bacteria , but don’t have peptidoglycan layers
* 2 membranes ( outer and inner )
* Unable to produce their own ATP, they called “Energy parasites” so it should be inside the cells to utilize energy from host cells .
* We have 2 morphologies of Chlamydia :
1. **The Elementary body** when infection occur through inert form **,** doesn’t do any metabolism at all ,rigid but it’s the mean by which its transmitted to other cells . it’s the infectious form .
2. **The** **Reticulate body ,** the active form , inside the cell (can’t exist outside the cell) non-infectious , but it’s the pathogenic variety , not killed by phagylosome (because it inhibit the fusion of the endosome with the lysosome ) .

# So bacteria( **elementary body**) stick to side of the cell (coronary / epithelial cells mainly)

# Enter the cell by endocytosis.

# Change its morphology to become **reticulate body** which causes the disease.

# Replicating and multiplying within the infected cell.

#Then these change to elementary bodies .

# Now the cell either:

1. Burst (infected cell) which will release the elementary bodies and infect other cells , they get out once a time .

OR

1. The elementary bodies removed by reverse endocytosis (exocytosis) , they removed one by one .

**C.Trachomatis diseases :**

* The main disease of Chlamydia is ocular disease **(Trachoma)**

It doesn’t affect the cornea directly , it infect the eyelid then form scar tissue and the eyelid turn inside , now your eyelid go against cornea so every time you blink , you actually scraping your cornea with your eyelashes , it lead to ulceration of cornea , secondary infection then you get blindness (due to corneal opacities )

Be careful the eyelid which infected by bacteria **not** cornea .

Its transmitted either by touching or by flies (ذبان) :P

* **Lymphogranuloma venerium (LGV)** : disease which is present mainly in tropical areas specially in Africa .

Sexual transmitted disease , usually having ulcer in genital area then swelling of guinal draining lymph nodes (like syphilis)

* **Conjunctivitis .**
* **Urethritis**, sexual transmitted disease ,( **Non-gonococcal** urithrites)

**#Remember :**

Usually urithrites caused by

 - **gonococcal** urithrites , which I can isolate the gonococcus from pussy discharge.

but there is another variety which is:

- **Non-gonococcal** urithrites , you can’t isolate gonococcus , caused by : Chlymida(mainly) ,Mycoplasma genitalium and ureaplasma .

* **Cervicitis** sexual transmitted disease.

**#mycoplasma And Ureaplasma**

They are really the same, except that ureaplasma is very tiny small colonies produce ureas , so almost they are the same .

-So **Mycoplasma** is the smallest free living bacteria , you can culture them .

Chlamydia and rickettsia are also small but **not** free living they are intracellular living and you can’t culture them in the lab .

-Mycoplasma don’t have cell wall or peptidoglycan , just one plasma membrane .

-they don’t respond to gram staining ,therefore , cannot be determined as either gram positive or gram negative .

Because of that they have multiple/funny shapes, may have filamentous shape

 But the lack of cell wall is compensating with steroids in the wall (plasma membrane) as in mammalian cells .

So when you grow them, you need a lot of nutrients including steroids.

- Is the only bacteria that have steroids in their plasma membrane .

 - The mycoplasma grow **slowly** ,take long time to grow, up to 3 weeks.

- They grow like “fried egg” appearance(appear under microscope) .

-They range from 0.2 - 0.8 micrometers and thus can pass through some filters (usually their size > 0.5 micrometer ) used to remove bacteria, so you can filter most other bacteria but not mycoplasma and because of that, the cell growth culture may be a problem

-Require sterols for growth and for membrane synthesis. The three species can be differentiated by their ability to metabolize **glucose** (*M. pneumoniae* ), arginine (*M. hominis*) or **urea** (*U. urealyticum*). The fourth species *M. genitalium* is extremely difficult to culture.

**We have 4 types of mycoplams :**

1.Mycoplasma pneumonia 2.Mycoplasma hominis

3. Mycoplasma genitalium 4.Ureaplasma urealyticum

* **Mycoplasma pneumonia** , cause **Atypical** pneumonia described as “walking pneumonia” ,the patient has pneumonia , his lungs has lots of infiltration it appear on x-ray **but** he isn’t ill as we thought not severe , he still can sit , walk , move …. Etc .

* **Mycoplasma hominis** , cause pelvic infection mainly or postpartum fever (حمى النفاس ) .
* **Mycoplasma genitalium** , cause **non-gonococcal urethritis** .
	+ **Ureaplasma urealyticum** are very small called t-strains (tiny strains) cause **non-gonococcal urethritis .**

**# RICKETTSIA**

-Are **“energy parasites**” , small obligate intracellular parasites , were once thought to be viruses but it’s definitely bacteria .

-there wide collection of these , produce many of **diseases and fevers** especially present in America like rocky mountain spotted fever .

-the fevers usually accompany with rashes .

-the main disease it cause is **typhus ( not typhoid )**

-transmittion usually by **insects** (tick ,mite ,louse,flea) ; need vector .

-gram negative ,poorly staining .

-there is alot varieties of Ricketisia, the one we should memories ***R. tsutsugamushi*.**

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