

Medical Bacteriology- Lecture 11

Spirochaetaceae

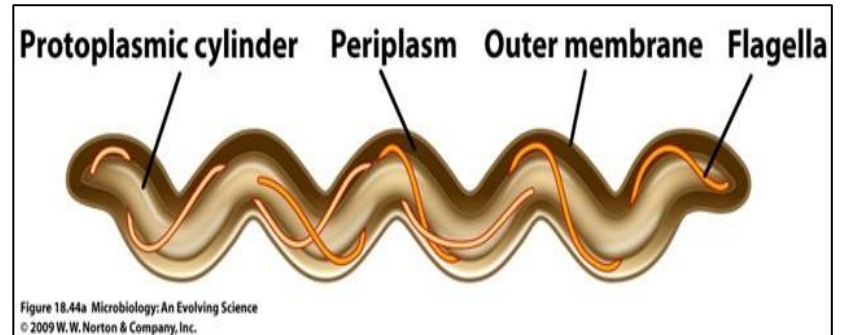
Treponema

Borrelia



Spirochaetaceae

- **Characteristics**
- Gram negative rods
- **spiral cells (cork-screw-shaped)**
- aerobic to strict anaerobic, free or strict parasites.
- **Motile**
- **axial filament or endoflagella (preiplasmic flagella)** between the cell wall and outer membrane



Medically important species

- **1- Treponema**

- *T. pallidum*----- Syphilis
- *T. peritum*----- Yaws
- *T. carateum*----- Pinta

- **2- Borellia**

- *B. recurrentis*-----
relapsing fever
- *B. hermsii* -----
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- **3- Leptospira**

- *L. interrogans*----- Leptospirosis
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Treponema pallidum

- **Cause syphilis (sexually disease)**
- **Too thin to be seen with light microscopy in specimens stained with Gram stain**
- **Not cultured in artificial media,**
- **Actively motile, rotating steadily around their endoflagella**
- **Route of Transmission**
 - **Sexually contact**
 - **congenitally from mother to fetus**

Pathogenesis of *T. pallidum*

First few years

No signs or symptoms are observed

Primary stage

- Painless **Chancre** in genital tract (highly contagious)
- Chancre heals without treatment, but organism has disseminated

Secondary stage

- widely disseminated mucous membranes lesions
- Skin rash, reddish- brown spots on hands & button of feet.
- highly contagious
- Lesions heals without treatment

Latent stage

- Symptoms may disappear 1-10 years
- Specific Anti- treponemal antibodies

Tertiary stage

- **Gummas**
- Damage internal organs, nerve system, cardiac, blood vessels
- No treatment
- Death cases

Congenital syphilis

- **Treponema cross the placenta during gestation**
- **Outcome:**
 - **Damage mental development**
 - **keratitis**
 - **Deafness**
 - **Generalized syphilis**
 - **stillbirth**

Virulence factors

- **Outer membrane proteins promote adherence**
- **Hyaluronidase**
- **Molecular mimicry (resistant host defences)**

Syphilis Diagnosis

- **Direct:** Motile in dark field microscope
 - Immunofluorescence stain
- **Indirect:** Serological tests for syphilis
 - **A- Non-treponemal antigen test (detect antibodies to nonspecific antigen)**
e.g:
 - Complement fixation test
 - **B- Treponemal antigen tests (detect antibodies against specific *T. palladium* antigens).** e.g:
 - *T. pallidum* immobilizing test (TPI)
- **Treatment:** Penicillin- Tetracycline- Erythromycin

Borellia

- Highly flexible irregular spiral organism
- move by rotation and twisting
- **Arthropod transmitted spirochetes**
- Cultured in complex serum-rich artificial media and embryonated eggs.
- Famous in **antigenic variation (virulence factor)**
- **Causes relapsing fever (Borelliosis) - two types:**
- *Borellia recurrentis*
- *Borellia hermsii*

Relapsing fever

	<i>B. recurrentis</i>	<i>B. hermsii</i>
Transmitted	lice	ticks
Relapses	One time	Three times
Causes	Epidemic (more severe)	Endemic (sporadic cases)

Treatment: Tetracyclin or erythromycin