










Microbiology – Final








Bacteriology

URTI: upper respiratory tract infection

Gram positive bacteria					
Name & shape	spore	motility	respiration	notes	main disease
Staphylococcus Grape like cluster Aureus Epidermidis saprophyticus 	X	X	facultative	Catalase+ Coagulase+ Novobiocin sensitive Novobiocin resistant	-pyogenic infection -skin infection -food poisoning -TSST -prosthetic joint infection -endocarditis -Urinary tract infection
Streptococcus Chain shape or pairs Pyogenes Agalactiae Faecalis Bovis Viridans Pneumonia  	X	X	-	- Lancefield-A β-hemolysis Group -B β-hemolysis Group -D α or β or non D// α or non	- -pharyngitis -cellulitis -impetigo -TSST Neonatal sepsis & meningitis UTI & endocarditis Endocarditis -Endocarditis (major) -dental caries α hemolytic has vaccine -pneumonia -meningitis -bacteremia -URTI
Bacillus long & deeply stained rods anthracis cerus 	middle	X	Aerobic	- has vaccine heat stable spores	- Anthrax Food poisoning
Clostridium long & deeply stained rods tetani Botulinum Perfringens Difficile 	lateral tennis racket	-	Anaerobic	- Has toxoid vaccine Trivalent antitoxin A,B,E faecal-oral	- Tetanus Botulism Wound = gas gangrene Ingested = food poisoning Pseudomembranous colitis
Corynebacterium diphtheriae V-shaped rods 	X	X	Aerobic	-Toxoid vaccine -Black colony	Diphtheria

Listeria monocytogen V-shaped small rods 	X	Tumbling	Aerobic	β Hemolysi -intracellular -live in cold Tp.	-Sepsis & meningitis -gastroenteritis
Neither G+ nor G-					
Mycobacterium Rod shaped 	X	-	Aerobic	Acid fast + -intracellular -intracellular -intracellular	- Tuberculosis Leprosy Opportunistic infection
Gram negative bacteria					
Name and shape	spo	motility	Respiration	Notes	Main disease
Enterobacteriaceae rods 	X	-	Facultative	-common Ag Fecal contaminated infection	- -Diarrheal disease -UT & GI infection -neonatal meningitis
Salmonella				large inoculum required person-person infection -Fecal oral	-Typhoid & paratyphoid fever -GI infections
Shigella				Fecal oral	-Shigellosis (bloody stool, fever, diarrhea)
Klebsiella					-pneumonia & UTI
Proteus				Urease +	-wound infection
Yersinia				zoonotic	Plague طاعون
Spirochetes (STI) Long helically coiled 				Double membrane	
Treponema			Anaerobic	O ₂ sensitive	Syphilis
Borrelia				Hard tick → Soft tick →	Lyme disease Relapsing fever
Rickettsiaceae (STI) rods 			Aerobic	-intracellular -Giemsa stain	-Rocky mountain & spotted fever -Epidemic typhus
Bartonella (STI) rods 			facultative	intracellular	Cat scratch disease
Chlamydia (STI) 1st				intracellular	-blindness by trachoma -Urogenital infection
Neisseria (STI) 2nd Diplococci 			Aerobic	Oxidase + Catalase + Chocolate agar	
Gonorrhoeae					-Gonococemia -Gonorrhoeae
Meningitidis					-meningococcaemia -meningitis

Moraxella diplococci 			Aerobic	Oxidase+	Upper and lower respiratory tract infection
Pseudomonas (opportunistic) Pairs of slightly curved rods 		motile		-cytochrome oxidase -distinctive smell -pyocyanin (blue-green)	-pulmonary infection -skin & soft tissue inf. -UTI (catheters) -Eye & ear infection -endocarditis
Legionella Slender rods			Aerobic	-Intracellular -Yeast extract agar	-Pontiac fever -Legionnaires disease (pneumonia)
Bordetella pertussis Small cocci			Aerobic	Has vaccine	-Pertussis 'whooping cough' السعال الديكي
Hemophilus Small blood lovers Influenzae Aegyptius Ducreyi Nonencapsulated				Its media should have one of: 1)hemin (X) 2)NAD (V)	Has vaccine Meningitis , Epiglottitis pneumonia conjunctivitis (eye inf.) chancroids (STD) upper & lower airway infection
Campylobacter jejuni Small curved rods "grow at 42°" 		motile	microaerophilic	-Zoonotic -Oxidase + -Catalase +	-Gastroenteritis -Guillain barre syndrome -reactive arthritis
Helicobacter pylori spiral 		corkscrew	microaerophilic	-urease + -fecal-oral	-Gastritis -Peptic ulcer
Vibrio cholera rods, polar flagella (01 / 0139) 			Facultative anaerobes	-Fermentative -Oxidase +	Cholera (spread by contaminated water) (watery diarrhea)
Mycoplasma Smallest bacteria pneumonia Genitalium (genito-urenary)				-don't have cell wall -cell membrane has sterol	-Tracheobronchitis -pneumonia -Nongonococcal urethritis -pelvic inflammatory disease
Aggregatibacter Actenomyces comitans Aphrophilus		X	facultative		-Endocarditis of artificial heart valves -Periodontitis التهاب اللثة

Done by: Sohob Al-shabatat



Mycology

Superficial				
Causative agent	Characteristic	Disease	Location	Notes
Malassezia	-lipophilic yeast -round in shape	-pityriasis versicolor (tinea versicolor)	-skin -trunk -proximal limb	-thick septate hypha -cluster of budding yeast
Furfur		-Seborrheic dermatitis		
Cutaneous				
Dermatophytes -Microsporum -Trichophyton -Epidermophyton	-Filamentous -Molds	-Ring worm (tinea)	-Keratinized: Skin, hair, nail	-branching hypha
Subcutaneous				
Madurella mycetomata		-Mycetoma (Madura foot)	-lower limbs -hands	Septate hypha
Actinomycetes	filamentous aerobic bacteria	Actinomycetoma	-lower limbs -hands	Septate hypha
Opportunistic				
Candida albicans	-Oval yeast -Gram positive -Glucose & maltose fermenters	-Skin invasion -mouth infection -vulvovaginitis -Nails infection	-upper RT -GIT -Female GUT	Pseudo hypha
Cryptococcus neoformans	-yeast -Encapsulated	Cryptococcosis	-Lung -Brain	
Aspergillus fumigatus		-Aspergillosis -Bronchopulmonary allergy	-Lung -Brain	
Zygomycota -Rhizopus -Absidia -Mucor	-Molds -Saprophytic تتغذى على الأشياء الميتة	Zygomycosis	-Nose -Eye -Heart -Brain	
Pneumocystis jirovecii		Pneumonia	-Lung	Treated with TMP-SMX
Endemic				
Thermally dimorphic fungus	Types: -Coccidioidomycosis -Histoplasmosis -Blastomycosis -Paracoccidioidomycosis	Endemic mycosis	-Systemic -Lung	Each type is geographically restricted to specific areas of endemicity

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Parasitology

V: vector // i: infective stage // T: treatment

Habitat: Large intestine				
Name	Characteristics	Transmission	Disease	Notes
Entamoeba histolytica	Rhizopoda	Fecal- oral	-Amoebiasis -Amoebic dysentery T: metronidazole	-Mature cyst has 4 nucleus -Binary fission
Balantidium coli	-cilia		Balantidiasis (dysentery)	T:Metronidazole
Habitat: Duodenum & jejunum				
Giardia Lamblia	Flagella	Fecal contaminated water and food	Giardiasis T: Metronidazole	-binary fission -i: cyst & trophozoite
Habitat: intestine				
Cryptosporidium	-intracellular -sporozoan		-Cryptosporidiosis -i: sporulated cyst	-sexually multiply -Acid fast +
Cyclospora	-intracellular -sporozoan		Cyst need week to be infective	-Acid fast stain
Habitat: Urogenital				
Trichomonas		sexually	-Trichomoniasis vaginitis -vaginitis & vulvovaginitis	Doesn't have cyst
Habitat: Blood				
Trypanosoma Brucei Cruzi		V: tsetse fly V: Reduviid bug	Trypanosomiasis African American	Unilateral eyelid swelling
Leishmania Tropica & major Braziensis Donovani	-intracellular	V: F sand fly	Leishmaniasis Cutaneous Mucocutaneous Visceral	Flagella Shawn of the face
Plasmodium Falciparum Malaria Vivax & ovale	Sporozoan	F anopheles mosquito	Malaria Malignant tertian malaria Quaternary fever Benign tertian malaria	
Habitat: Tissue				
Toxoplasma gondii		V: cats		

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Helminth

Nematode			
Name	Habitat	Disease	Notes
Ascaris lumbricoids	-intestine -Lung	-Obstruction of bowel and bile duct -Pneumonitis	-Infect by eggs
Enterobius vermicularis	-intestine	-Perianal pruritis حكة	Fecal oral transmission
Trichuris trichura	-intestine (colon)		Whipworm دودة سوطية
Ancylostoma duodenale & Nectar Americans	-intestine	-Hook worm disease (anemia & iron deficiency)	Hookworm دودة خطافية
Strongyloides strecoralis	-intestine -tissue	دودة خيطية تلد بدون ذكر	-Thread worm -Parthenogenic
Trichinella spiralis	Intestine & tissue		
Wuchereria bancrofit & Brugia malayi	-tissue (lymph node)	-Elephantiasis	Mosquito
Onchcerca volvulus & Loa Loa	-tissue (lymph node)	-Eye worm disease	Flies
Trematode			
Fasciolodae		خنثى	Hermaphroditic
Clonorchis sinensis & Fasciola hepatica		Liver fluke	
Paragonimus westermani		Lung fluke	
Schistosoma		Blood fluke	Hermaphroditic
Mansoni	Intestinal vein (inferior mesenteric of L.intestine)		Eggs has lateral spine
Japonicum	Inferior & superior mesenteric vein of S.intestine		Eggs has curved spine
Haematobium	Veins of urinary bladder		Eggs has terminal spine
Cestode			
Tania Soginata			- Hermaphroditic -No mouth
Solium		Cysticercosis & Epilepsy	
Echinococcus granulos	-intestine -liver & lung	Hydatid cyst	- Hermaphroditic -No mouth
Diphyllobothrium latum	Intestine		-row fish -tapeworm -the longest (10 m)

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Virology

T: transmission I.P: incubation period

Name	Structure	I.P	Disease	Note
DNA single stranded				
Parvovirus	Two coat proteins	1-2 w	-Erythema infectiosum -Transient aplastic crisis -Pure red cell aplasia -Hydrops fetalis	-B19 is the most common -Erythroid infection T: respiratory route
DNA double stranded				
Adenovirus	-Naked -Icosahedral		-Ocular infection -Respiratory, Urinary tract ,Gastrointestinal infection	-T: respiratory or fecal-oral -Live vaccine
Polyomavirus JC, BK	-circular DNA -Icosahedral -Capsid -5 proteins		-Upper respiratory tract infection -Cystitis (BK) -Leukoencephalopathies (JC) -Markle cell carcinoma (MCP)	-MCP type causes cancer -T: respiratory & body fluids
Papillomavirus	-circular DNA -Naked -Icosahedral		-Cervical cancer -Anal cancer -Oropharyngeal cancer -Warts الثآليل	-T: sexually -Planter warts caused by B9 HPV -has vaccine
Poxviridae (Smallpox virus)	-Enveloped -Large -Brik shaped		Mulloscum contagiosum caused by <u>Variola</u> type which is self-limited	-T: respiratory -The only DNA virus replicate in cytoplasm -1 st disease eradicated -1 st disease has vaccine
Hepatitis B virus (Hepadnaviridae)	-circular DNA -Capsid		-Acute & <u>chronic</u> hepatitis	T: percutaneous & sexual & MTCT من الأم -has vaccine
RNA single stranded				
Hepatitis D virus (<u>Delta</u> virus)	-Circular RNA -Capsid		Acute & chronic hepatitis	-Require help from HBV -coated with HBsAg -T: close personal contact
Hepatitis A virus (Picornavirus)	+ sense -Naked -spherical	10-50 day 25-30 in avg	-Fever, abdominal pain, vomiting, jaundice -Encephalopathy & coma	-T: fecal-oral -stable at low PH -inactivated vaccine
Hepatitis E virus (Hepevirus)	+ sense -Naked	2w-2m	-Acute hepatitis	-T: fecal-oral -heat stable
Hepatitis C virus (Hepacivirus)	+ sense -Enveloped		-Acute & chronic hepatitis	T: contaminated blood & sexual & vertical
Retrovirus HIV-1	-diploid -icosahedral -Enveloped		-Leukaemia & lymphoma -Tropical spastic paraparesis -AIDS	T: vertical Sexual Blood products

Picornaviridae (Enterovirus)	-Not segmented -Naked -Icosahedral		-Acute aseptic meningitis	-T: fecal-oral or respiratory droplet -Acid stable
Poliovirus		1-2 w	-Mild febrile -Permanent paralysis	-Spread along axons of PNS to reach CNS -Has vaccine
Coxsackievirus			-Respiratory & acute febrile illness -Group A: Herpangina, hand foot mouth disease, hemorrhagic conjunctivitis	Disease cont.. -Group B: myocarditis, pleurodynia, pericarditis
Echovirus			-Encephalitis, common cold, Ocular disease, febrile	
Rhinovirus		2-4 d	-Common cold	
Orthomyxovirus	- sense Segmented enveloped		-Influenza (A+B) → -common cold (C) →	8 segments 7 segments -Has vaccine T: aerosol spread
Paramyxovirus	- sense Non-segmented -Enveloped			
Measles (Morbillivirus)			-Rubeola (koplik spots) -Pneumonia & encephalitis -Encephalomyelitis	-T: respiratory droplet -Has vaccine (live attenuated)
Mumps (Rubulavirus)			-Enlarged salivary gland -Meningitis & orchitis	-T: respiratory droplet -Live attenuated vaccine
Parainfluenza PIV (1-4)			-Common cold -Laryngotracheobronchitis (type 1+2) ((croup)) -Primary infection: rhinitis, Pharyngitis	Disease cont.. Primary infection with 1-2-3: croup, pneumonia, bronchiolitis -Otitis media
Respiratory syncytial virus RSV			-Pneumonia -bronchiolitis -Otitis media	-In infant -Lower RT
Toga virus Alphavirus (arbovirus)	-Enveloped (+ sense)		-Acute encephalitis -Acute arthropathy (chikungunya virus)	-Arthropod born virus -T: mosquitoes
Rubivirus (rubella virus)	-Enveloped (+ sense)		-Rubella -congenital rubella syndrome →	-Mildest viral Exanthems -In pregnant -Has vaccine
Metapneumovirus			-respiratory tract infection -Same as RSV	-Children & elders

Coronaviridae	+ sense -Enveloped		-Common cold	-Found in bats -network reservoirs
SARS coronavirus		2-11 d	-severe acute respiratory syndrome	-Fatal virus -Cat reservoir
MERS coronavirus		2-13 d	-middle east respiratory syndrome	-Fatal virus -Camel reservoir
Norovirus (caliciviridae)	+ sense -Naked		-Viral gastroenteritis -Watery diarrhoea	-door handle vector -T: oral rehydration
Rotavirus (Reoviridae)	<u>Ds-RNA</u> -segmented		-Viral infantile gastroenteritis -Malabsorption & fat in stool	-mostly in winter -T: oral rehydration -live-attenuated vaccine (orally)
Astrovirus	-star shaped		-Gastroenteritis	
Arboviruses				-Vertebrate host -Blood sucking vector Isn't transmitted by human
Flaviviridae				
-Yellow fever virus			-Yellow fever	
-Dengue virus			-Dengue fever	
-West Nile virus			-West Nile fever -(meningitis, encephalitis)	Mosquito-born virus
Zika virus			-Zika fever	-Transmitted by mosquito, Vertical & sexual
Togaviridae	+ sense		-Encephalitis & arthritis	-we talk about it up!!
Ebola virus (Filoviridae)	filamentous shape		-fever, headache, sore throat, and myalgia followed by abdominal pain, vomiting, diarrhea, and rash, with both internal and external bleeding, often leading to shock and death.	T: respiratory droplets, body contact and Fomites -have the highest mortality rates of all the viral hemorrhagic fevers.
Rabies virus	- Sense -Enveloped	1-3 m 1w-1y	-Encephalitis -bizarre behaviour -hydrophobia	T: animal bite (dogs)
Prion diseases				
Prion protein			-Transmissible Spongiform Encephalopathies -Creutzfeldt–Jakob Disease	-100% mortality rate -resistant to formaldehyde, dry heat and boiling, proteases -sensitive to phenol

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