Immunology: Innate Immunity



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The Immune System is the Third Line of Defense Against Infection

Nonspecific del	SPECIFIC DEFENSE MECHANISMS (IMMUNE SYSTEM)	
First line of defense	Second line of defense	Third line of defense
Skin Mucous membranes Secretions of skin and mucous membranes	Phagocytic white blood cells Antimicrobial proteins The inflammatory response	Lymphocytes Antibodies

Immunity

Non specific \ Innate\ Non adaptive \natural immunity

- 1. First and some times second line of defense.
- 2. Immunity an organism is born with.
- 3. Genetically determined.
- 4. No enhancement by repetition

Acquired\ Adaptive \ Specific Immunity

- 1. Third and some times second line of defense.
- 2. Immunity that an organism develops during lifetime.
- 3. Not genetically determined.
- 4. May be acquired naturally or artificially
- 5. Get enhanced by repetition

Innate Immunity

Operates through Five main factors:

1.Physical and mechanical barriers.

2. Biochemical barriers

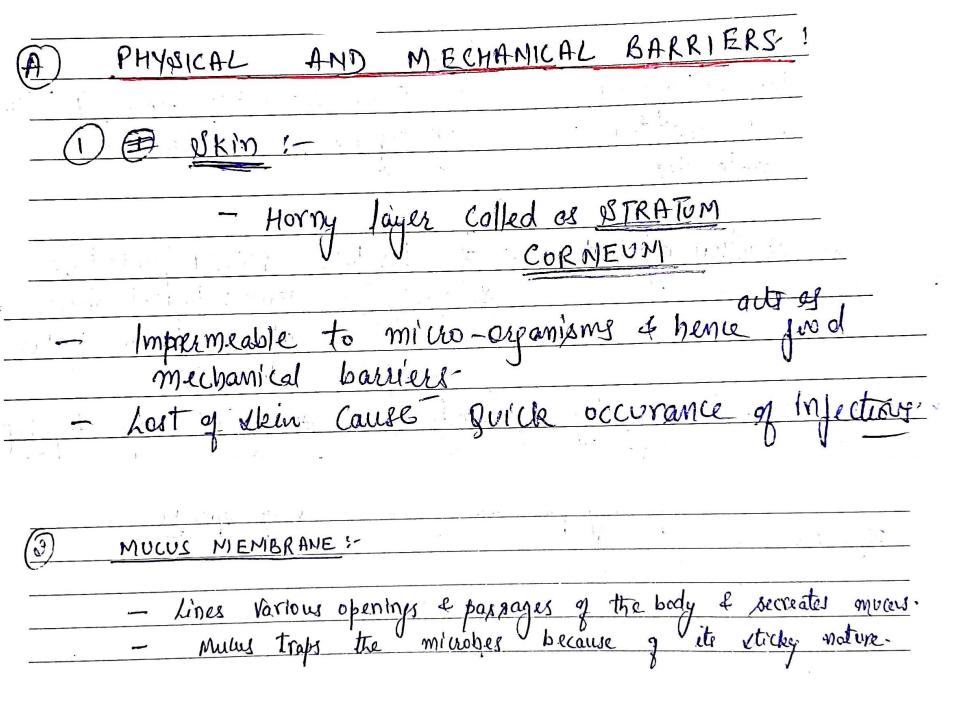
3. Cellular factors

4. Genetic factors

5. Other factors

1. Physical and mechanical barriers.

- ✓ SKIN
- ✓ MUCUS MEMBRANE
- ✓ CILIA
- ✓ COUGHING AND SNEEZING
- ✓ WASHING ACTION OF Saliva AND URINE



3 CILIA:
-> Epilhitial Cells of respiratory participal DAY

ore lined with cilia

-> Microbe's trapped in mucus of respiratory

-- passage are swept away by these cilia:

(W) (COUGHING AND SNEEZING:-
F	produce the form to the state of
	-> These help to drive out the foreign particles that enter the
	These help to drive out the foreign particles that enter the digestive tract 4 respiratory tract.
(5.)	WASHING ACTION OF SALIVA TEAR & URINE:
, '' 1 () -	The lackamine decreation namely teams cause the plushing action of
	The lackamine decreotion nomely tears cause the flushing action of the foreign particles in the conjunction of the eye.
	· Solivary action cause swallowing of the particles that enter the
	mouth.
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in the first	

2. Biochemical barriers

- ✓ SKIN SECREATIONS
- ✓ DIGESTIVE TRACTSECREATIONS
- ✓ HUMAN MILK
- ✓ LYSOZYME
- ✓ NASAL SECREATIONS AND SALIVA
- ✓ INTERFERONS
- ✓ COMPLEMENT
- ✓ SEMAEN
- ✓ SECREATIONS OF BACTERIAL FLORA

OKIN SECREATIONS: secreations of rebaceous & sweat glands acts as antiseptics as they contain lactic acid & otes jumpicidal à bactericidal activities **Notes** The low PH (5-5) of sweat microbicidal activity

-> Certain allas of the body namely
soles q the feet are déficient of
sebacions glands & theirfoir there arears are
sometimes referred to as ALKALINE GARS
(2) DIGESTIVE TRACT SECREATIONS:
- High acidity of stomach (PH-2.0) has microbicidal activity. This is
Thigh acidity of stomach (PH-2.0) has microbicidal activity. This is due to the activity of HCl Which is secreted by the DXYNCTIC CELLS, lining the stomach.
DXYNCTIC CELLS lining the stemach.
3) HUMAH MILK.
Rich in antimicrobial substancy namely latte fessitin and numic
aid: These fight against E. Coli & estaphylococci.

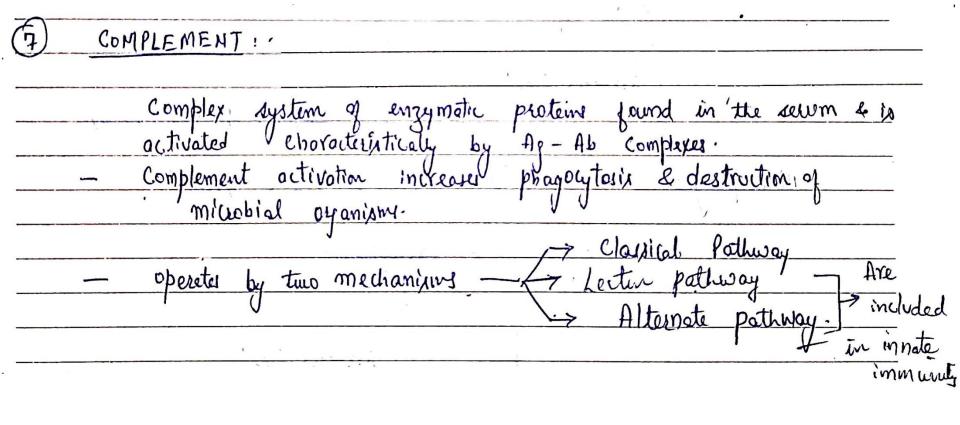
4) Lysozyme !
Tears, Soliva polymorphonulear lencated human milk & most
Tears, soliva, polymorphonulear lencates human milk & most tipsue fluids (except (crebro spinol fluid, sweet & urine) contains a mucolytic enzyme called N-Acetylmuramidase, Known as LysozyME
mucolytic enzyme called N-Acetylmuramidase Known as LysozyME
Sunday 19 -> Discovered by flamming in 1922.
Sunday 19 -> Dis covered by flamming in 1922. -> LON mol. Wit. proteins.
Helps in hypix of many G+Ve bacteria by splitting of the sugars from the shapeptide of the cell Wall.
supars from the glycopeptide of the cell Wall.

B) NASAL SECREATION AND SECREATIONS:
-> contains mucopolysaccharides which inactivates cutain Viruses.

INTERF	ERONS (Ifn)						e e e e e e e e e e e e e e e e e e e
·-	simall.	82. 9	soluble	, മത	toxi'c	14 a protein	produced	in
	Small	amain	nts by	actuate	d T-c	1111	1	-

Antiviral agents Inhibits introcellular Viral replications in the alls injection with Viruses.

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8) d'EMEN:- Contains bactericidal components viz

(9) SECREATION OF BACTERIAL FLORA

- Bacterial flora of skin produces antimicrobial substances like Bacterio cins & Acids:
- Baiterial part flora. of human gut live as Commensals. They secretes colicins And Acids Which do not allow entry of other microbes into the body.
- Voginal Wall has Loctobacillé which produce antibacterial

3. Cellular factors

- ✓ NEUTROPHILES
- ✓ BASOPHILES
- ✓ EOSINOPHILES
- **✓** MONOICYTES
- ✓ MACROPHAGES
- ✓ NK CELLS

(C)	CELLULAR FACT	oRS:-	1	
X	PHAGOCY TOSIS! -	Process of	cell eating	
			V	
	cells of Phagory	tosix!	3	
(A)	mocrophages:			lear leucogtes
1	· / / * - *	me (ne	utrophili base	phila & eosinophila)
	(-1.3.)			
(B)	Macrophages !-	cells of mone	muclear phagos	ytic system
	, V	1		V
	Maria Maria	mocytes ->	Macrophages.	
		<i>U</i>	1.0	
		2) 7		
	•	free	Alveola	difixed.
		eg. Alveo	lar peritoned.	Ruppfer Celly Note
	•	tree mallop	hafes in	estecolates (Bones)
		lymph & of	ter tipus	1
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				of lymphoid Tissued.

TWIFS Process of phagocytosia! JANUARY
1 2 3 4 7 8 9 10 11 WEDNESDAY
14 15 16 17 18 Chemotaxia - Attachment - Injection - Intracellulae 28 129 30 31
Killing.
Diges tron
(a) We will be some where the some some some some some some some som
MK cell :- Non specifically kills virus injected & tumor celly.
- (1 V = (1) (1) (1) (1) (1) (1) (1)

4. Genetic factors

- ✓ SPECIES IMMUNITY
- ✓ RACIAL IMMUNITY
- ✓ INDIVIDUAL IMMUNITY

D) Genetic Effect / Factors :-
their by it differs at the level of species vaces & individuals.
1) April 1 mmunity !- Refers to the resistance to pathogens exhibite by all the members of a species.
ej. @ Rati are insusceptible to diptheria while juinea pigs & human beings are highly susceptible to the same. (b) Human beings are highly susceptible to the common wide but dogs are not
but does are not
De Raciel Immunity: Within a species, different races may show differences in susceptibility to injections which is known as racial immunity.
et. In U.S.A Negroes au susceptible to T.B. than Whites.

Individual Immunity: The differences in innate immunity in Shown by different individuals of same race in known as Individual immunity.

5. Other factors

- ✓ TEMPERATURE
- ✓ INFLAMATION
- ✓ FEVER

(É) OTHER FACTORS!-
@ Temperature! - Important in determining invate immunity.
ex Tubercule bacilli are potherenic to mammals (worm blooded)
but will not inject the cold blooded animals
Hens (body temperature 4°C) are naturally immune to anthrax. But can be uperted of body temp is long.
SWITT THE THE THE THE THE THE THE THE THE T
(B) INFLAMATION:
- Injury to tissues and irritation caused by
the entry of pathopens leads to the cellular & Vascular changes
known as inflammation
- Characterized by four important features!
@ heat (b) Pain (c) Redness & (d) Wwelling.

- A rise in body temperature (Pysexia) following injection.

- Natural defence mechanism.

- Rise in body temp belps to accelerate the physiological process & may also destroy the patteren itself.