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**QNO1:Fill in The Blanks.**

**Answer:**

**1)Probiotics.**

**2) Sybiotics.**

**3)Bacteriostatic**

**4)Resident Flora**

**5)Commensalism**

**6)Transduction**

**7)Plasmid**

**8)Normal flora**

**9)Transcription and translation**

**QNO1:What is Normal flora, advantages and disadvantages of Normal flora?**

**Answer:** The organisms that grow in or on the body without producing obvious harmful effect on the host makes up Normal flora.

* Normal flora is the mixture of micro organisms(bacteria and fungi) that are regularly found at any anatomical site of Human body.
* Normal Flora are also referred as commensals i.e they drive benefit from host but do not damage it.
* Viruses and parasites are usually not included in this category.

**Advantages of Normal Flora:**

* They prevent colonization by pathogens by competing for attachment and Nutrients.
* Some synthesize Vitamins that are absorbed as nutrients by host eg Vitamin K and B13
* Some produce substances that inhibits pathogenic species.
* They stimulate the development of certain tissues e.g Colon and lymphatic Tissues gastrointestinal tract

**Disadvantages of Normal flora.**

* They can causes disease in following

a)When individuals become immunocompromised

b)when they change their usual anatomic location.

 > body odour originates from skin.

**QNo2: Write in detail the different stages of Pathogenesis?**

**Answer:**

The manner of development of diseases is called Pathogenesis.

**Stages of Pathogenesis:**

**1)Transmission**

 > In order to begin infection and eventually cause diseases ,pathogens must find a transmission route.

* Transmission of an infectious agent can occur in many ways but it is typically through exposed skin (eg a cut, puncture or wound) or mucus membrane (eg gastrointestinal tract , respiratory tract.

**2)Adherence:**

 > Once the pathogen has gained access the body it must have some means of attaching itself to the host’s tissues.

 > This attachment is called adherence and is a necessary step in pathogenicity.

 > Microbes contain ligands which are projections that attach host receptors or surface proteins.

 > if a micro organism cannot adhere to a host cell membrane ,diseases will not occur.

**3)Invasion:**

  **>** At this stage microbes begins to invade the host and produce a bacteremia or viremia.

 > Some bacteria are able to cause disease while remaining on the epithelial barriers while many need to penetrate that barrier.

 > Once this barrier has been penetrated these pathogens can multiply without competition.

**4)Colonization:**

 >Colonization is the multiplication of pathogenic organisms where toxins are produced and normal flora are overcome.

 >During this stage pathogens complete with normal flora for space and nutrients.

 > Pathogens are usually colonize host tissues that are in contact with external environment.

**5)Evasion of Host defenses:**

* After colonization,Pathogens circumvent the host’s innate and adopted defenses by phagocytosis.
* Multiple mechanisms are used by pathogens to evade a host’s immune system.
* Pathogens must also avoid adapted defenses.
* In addition, pathogens can mimic host molecules which can cause diseases related damage.

**6)Cause damage or diseases to Host:**

 > Damage can occur through direct or indirect pathways.

 > Three types of toxins are produce to cause damage.

 **Exotoxins:** Proteins secreted by pathogens that cause damage to the host.

 **Endotoxins:**Toxic substances that are released when a cell is killed(Lipoly saccharides).

 **Exoenzymes:** Enzyme that function outside the host cell or tissues.

**7)Exiting the Host:**

 > A pathogen must exit the Host.

 > This occurs through various routes.

 >Examples including sneezing, Coughing ,pus , blood or insects bites.

**8)Survival outside the Host:**

 >Finally a pathogen must be able to survive in the environment long enough to be transmitted to another host.

 >Some are hardy and can survive for several weeks before a new is host is found.

 >There are others that survive in animal reservoir or require to direct contact because they fargile.

**QNo4:How the Gene transfer from one bacterium to another?**

**Answer:Methods of Gene transfer:**

Bacteria can acquire DNA( i.e new genes) in basic three ways l.

**1)Transformation:**

Uptake and retention of external DNA molecules.

Under this right condition bacteria can take in external DNA fragments or plasmids by transformation.

* DNA binding proteins transfer external DNA across the cell envelope.
* Homologous recombination can then occur.
* Bacterial cells capable of transformation are referred to as component.

**2)Conjugation:**

Direct transfer of DNA from one bacterium to another.

* Requires F factor plasmid.
* Have all the conjugation genes.
* Directs formation sex pilus.
* Single DNA strand produce by DNA replication is transferred to F-cell through sex pilus , recipient produce 2nd strand.

**3) Transduction:**

The transfer of DNA between bacteria by a virus.

* A virus( phage) particle can transfer DNA fragments from one host cell to another followed by recombination.
* Requires a virus to be packed with bacterial DNA by mistake.

**QNO5: Short Notes on the following**

**1)Symbiotic relationship**

**2)Antimicrobial drug**

**3)Anti microbial Resistance**

**4)Probiotics**

**5)Prebiotic**

**Answer:**

**1)Symbiotic relationship:**

Symbiotic relationship are special type of interaction between species. Sometime beneficial and sometime harmful.These relations are essential to many organisms and ecosystem.

**Commensalism:**

One get benefits and one is unharmed.

Eg:Barnacles on a scallop.

**Mutualism:**

 Both species get Benefits.

Eg:Clown fish.

**Parasitism:**

One specie get benefit and one is harmed

Eg:Mosquito on human skin.

**2)Antimicrobial drug:**

 A drugs that are used to treat infections with micro organisms are known as anti microbial drugs.

A drug used to treat a microbial infection. "Antimicrobial" is a general term that refers to a group of drugs that includes antibiotics, antifungals, antiprotozoals, and antivirals.

**3)Antimicrobial Resistance:**

 Antimicrobial resistance is the ability of microbes to resist the effects of drugs in same dosage. When the drug loose the ability to either kill or inhibit the growth of microbes and the microbes gain the ability to survive in the presence of drug to which they were previously susceptible this is called resistance.

 **4)Probiotics**

 We usually think of bacteria as something that causes diseases. But the body is full of bacteria, both good and bad.

Probiotics are often called "good" or "helpful" bacteria because they help keep your gut healthy.

Probiotics are live bacteria and yeasts that are good for and have beneficial effects on the host by improving its intestinal microbial balance.

 **5)Prebiotic:**

 Non-digestible food ingredients that beneficially affect the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon, and thus improve host health”.

Prebiotic first identified in 1995.

Typically oligosaccharides:

Found in Breastmilk, chicory root, leek.

**The End.**