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QNO1 :: FILL IN THE BLANKS

ANSWERS::

- I. Probiotics**
- II. Synbiotic**
- III. bacteriostatic**
- IV. Normal flora**
- V. Commensalism**
- VI. Conjunction**
- VII. Plasmid**
- VIII. Normal microbial flora**
- IX. Transcription and translation.**

QNO2 : What us normal flora, advantages and disadvantages of normal flora?

ANSWER :: Normal flora ::

- ❖ **The normal flora is a bacteria found in or on one's bodies on a temporary basis without causing disease.**
- ❖ **It is a term used to describe the various bacteria and fungi that are permanent residents of certain body sites, especially skin, oropharynx and colon.**
- ❖ **Viruses and parasites like portozoa and helminths, which are the major groups of microorganisms, are usually not considered members of normal flora, although they can be present in asymptomatic individuals.**
- ❖ **The normal flora organisms are often referred to as Commensals. Commensals are organism that derive benefits from another host but do not damage that hist.**
- ❖ **The term human microbiome is often used to describe the normal flora.**
- ❖ **The members of the normal flora vary in both numbers and kind from one site to another. Although the normal flora extensively populates many areas of the body, the internal organs usually are sterile.**
- ❖ **Areas such as the central nervous system, blood, lower bronchi and alveoli, liver, spleen, kidney, and bladder are free.**

Advantages and Disadvantages of normal flora ::

Advantages::

- ❖ **They prevent colonization by pathogens by competing attachments and nutrients.**
- ❖ **Some synthesize vitamins that are absorbed as nutrients by the host. Examples are K and B12.**

- ❖ Some produce substances that inhibit pathogenic species.
- ❖ They help digest foods as they break down food stuffs that are normally indigestible by the host into forms that are easily digestible by the host.
- ❖ The normal flora protect the host against infection by pathogenic organisms.

DISADVANTAGES ::

- ❖ They can cause disease in the following :
- ❖ When individuals become immunocompromised.
- ❖ When they change their usual anatomic location.
- ❖ They can act as opportunistic pathogens.
- ❖ They can gain access to Axenic tissues.
- ❖ They can share nutrients and drug resistance with pathogens.
- ❖ They may be a source of infection to other individuals.

QNO3:: Write in detail different stages of pathogenesis?

ANSWER :: The pathogenesis of a disease is the biological mechanism that leads to a disease state. The term can also be described the origin and development of the disease, and whether it is acute, chronic or recurrent.

STAGES OF PATHOGENESIS :: Following are the stages.

1: TRANSMISSION :

- ❖ In order to begin infection and eventually cause disease, pathogens must find a transmission route.
- ❖ Transmission of an infectious agent can occur in many ways, but it is typically through exposed skin e. g, (a cut, abrasion, puncture, or wound) or mucous membrane e. g (Gastrointestinal tract, respiratory tract or urogenital tract).

2:ADHERENCE ::

- ❖ Once the pathogen has gained access to the body it must have some means of attaching itself to the host tissue.
- ❖ This attachment is called adherence and is a necessary step in pathogenicity.
- ❖ Microbes contain ligands, which are projection that attached host receptor or surface proteins.
- ❖ If a microorganism cannot adhere to a host cell membrane, disease will not occur.

3:Invasion::

- ❖ At this point, microbe begin to invade the host produce a bacteremia (i. e presence of bacteria in the blood stream) or viremia (presence of a virus in the blood stream).
- ❖ Some bacteria are able to cause disease while remaining on the epithelial barrier, while many need to penetrate that barrier.
- ❖ Once this barrier has been penetrate, these pathogens can multiply without competition.

4:COLONIZATION ::

- ❖ Colonization is the multiplication of pathogenic organisms where toxins are produced and the normal flora are overcome.
- ❖ During this stage, pathogens compete with normal flora for space and nutrients.
- ❖ Pathogens usually colonize host tissue that are in contact with the external environment.

5: Evasion of Host Defenses::

- ❖ After colonization, pathogens circumvent the host's innate and adapted defense by phagocytosis.
- ❖ Multiple mechanisms are used by pathogens to evade a host's immune system.
- ❖ Pathogens must also avoid adapted defenses.
- ❖ They can also utilize antigenic variations to alter the antigen structure.
- ❖ In addition, pathogens can mimic host molecules, which can cause disease related damage.

6: Cause Damage or Disease to Host ::

- ❖ Damage can occur through direct or indirect pathway.
- ❖ Direct methods produce toxins, which are poisonous substances that produce toxemia within a host.
- ❖ Three types of toxins are produced to cause damage.
- ❖ EXOTOXINS:: protein secreted by pathogens that causes damage to the host like botulinum toxin etc.
- ❖ ENDOTOXINS:: Toxin substances that are released when a cell is killed.
- ❖ EXOENZYMES:: Enzymes that function outside the host cell or tissues.

7: Exiting the Host ::

- ❖ A pathogen must exit the body.
- ❖ This occurs through various routes.
- ❖ Examples include sneezing, coughing, diarrhea, coitus, pus, blood or insect 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 host is found.
- ❖ There are others that survive in animal reservoirs or require direct contact because they are fragile.

QNO4::HOW the gene transfer for one bacterium to another.

ANSWER :: Methods of gene transfer :

1: transformation

2: Conjugation

3: Transduction.

1: Transformation ::

- ❖ Under the right conditions, bacteria can take in external DNA fragments or Plasmids by transformation.
- ❖ DNA binding proteins transfer external DNA across cell envelope.
- ❖ Homologous recombination can then occur.
- ❖ Bacterial cells capable of transformation are referred to as competent.

2: Bacterial Conjugation ::

- ❖ It requires an F factor Plasmid.
- ❖ It has all conjugation genes.
- ❖ It has a directs formation of sex pilus.
- ❖ In this method single strand produced by DNA replication is transferred to F cell through the sex pilus, recipient produces 2nd strand.
- ❖ When an F factor a Plasmid is transferred from a donor (F⁺) to a recipient (F⁻), the F cell is converted into an F cell.

3: Transduction ::

- ❖ A virus (phage) particle can transfer DNA fragments from one host cell to another followed by recombination.
- ❖ This method requires a virus to be packaged with Bacterial DNA “by mistake”.

QNO5:WRITE short notes on the following.

ANSWER ::

A: Antimicrobial drugs::

- ❖ A drugs 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.

B: Antimicrobial resistance ::

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

C: Probiotics::

- ❖ We usually think of bacteria as something that causes diseases. But the body is full of bacteria, both good or bad.
- ❖ Probiotics are often called good or helpful bacteria because they help keep your gut healthy.
- ❖ Probiotics are live bacteria and yeast that are good for and have beneficial effects on the host by improving its intestinal microbial balance.

D: 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 healthy.

- ❖ First identified in 1995.
- ❖ Typically oligosaccharides.
- ❖ Found in Breastmilk, chicory root, leeks, onions, garlic, whole grain, beans, banana etc.
- ❖ It should increase the number and or activity of bifidobacteria and lactic acid bacteria.

D: Symbiotic relationship::

- ❖ Symbiotic is any type of a close and long term biological interaction between two different biological organisms, but it mutualistic, commensalistic, or parasitic.
- ❖ The organisms, each termed a symbiont, may be of the same or of different species.

THANK YOU

THE END.