Final-Term Assignment (Spring-2020) (BS-MLT 2nd Sec-A & Sec-B)

Course Title: Basic Microbiology **Instructor: Mr. Fazli Zahir Mian**

Time: 6 Hours

Q1: Fill in the Blanks.

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

2.Foods containing the combination of probiotics and prebiotics are referred to as *symbiotics*.

When a chemical substance inhibits

3.bacterial growth and proliferation is known as *Antibiotics.*

4.Microbes that are always present are called *Bacteria.*

5.The symbiotic relation in which one organism benefits, the other is neither helped nor harmed is known as *Commensalism.*

6. ***Conjugation*** is the direct transfer of DNA from one bacterium to another.

7.A genetic structure in a cell that can replicate independently of the chromosomes is known as ***plasmid.***

8.The population of microorganisms that live on the skin and mucous membranes of health normal person from birth until death is called ***Normal flora OR microbial flora***.

9.The expression of a gene into a protein occurs by ***transcription*** *and* ***translation.***

Q2: What is normal flora, advantages and disadvantages of normal flora?

Q3: Write in detail different stages of Pathogenesis.

Q4: How the Gene Transfer for one bacterium to another.

Q5: Write short notes on the following:

1. Symbiotic relationship
2. Antimicrobial drug
3. Antimicrobial resistance
4. Probiotics
5. Prebiotic

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Q No:1(Normal flora)
Answer:
Normal flora are the microorganisms that live on another living organisms human or animal or inanimate with causing diseases. Normal flora are present in the human body from birth until death. This normal flora helps to prevent us becoming colonised with more dangerous bacteria which might lead to infection.

- ***Advantages***
- *They constitute a protective host defense mechanism by occurring ecological niches.*
- *They produced vitamin B and vitamin k.*

- *The oral flora contribute to immunity by inducing low levels of circulating and secretary antibodies that may cross react with pathogens.*
- *Prevent colonization by competing for attachment sites.*
- *Prevent colonization by competing for essential nutrients.*
- ***Disadvantages***
- *They can cause disease in the following*

A. *When individual become immunocompromised.*
B. *When they change their usual anatomic location.*

- *Potential for spread in to sterile part of body.*
- *Intestine may perforat.*
- *Skin broken*
- *Extraction of tooth*
- *Perinatal skin flora enters urinary tract.*

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Q No:2(stages of pathogenesis)

Answer

- *Transmission from the source of infection in to the portal of entry.*
- *Evasion of primary host defense*
- *Adherence to mucus membrane*
- *Colonization by growth of the bacteria at the site of Adherence*
- *Disease symptoms caused by bacterial toxin or invasion*
- *Host immune response during steps 3,4,5*
- *Progressive or resolution of the disease*
- *Adhesion of microorganisms to host cells*
- *Propagation of organisms*
- *Damage to host cells by toxin or inflammatory response*
- *Evasion of host secondary defense's*

- *Host responses caused by toxin production or invasion accompanied by inflammation*
- *Host responses, both nonspecific and specific (immunity)*
- *Most bacterial infections are acquired from an external source, and for those the stage of infection*
- *Some bacterial infections are caused by members of the normal flora and as such as are not transmitted directly prior to the onset of infection*
- *Transmission from an external source into the portal of entry.*

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Q No:4 (how the gen transfer from one bacterium to another)

Answer : 3 steps

1. ***(conjugation)***

Conjugation is the transfer of circular DNA called plasmids through cell to cell contact. Transformation is the uptake of free DNA from the environment .

2. (transformation)

Horizontal gene transfer is the movement of genetic material between unicellular and multicellular organisms other than by the Transmission of DNA from parent to offspring. HGT is an important factor in the evolution of many organisms.
Horizontal gene transfer is the primary mechanism for the spread of antibiotics resistance in bacteria, and play an important role in the evolution of bacteria that can degrade novel compounds such as human- created pesticides and in the evolution, maintenance, and transmission of violence.

It often involves temperat bacteriophag and plasmids.

3. (transduction)

Transduction involves the transfer of a DNA fragment from one to another by a bacteriophag. Two form of transduction: generalized transduction and specialized transduction.

- *A bacteriophag absorbs to a susceptible bacterium*
- *The bacteriophag genome enters the bacterium. The genome directs the bacterium metabolic machinery to manufacture bacteriophag components and enzymes.*
- *Occasionally, a bacteriophag capsid mistakly assembled around either a fragment of the donor bacterium chromosomes or around a plasmids instead of around phage genome .*

- *The bacteriophag are released as the bacterium is lysed .*
- *The bacteriophag carrying the donor bacterium DNA absorbs to a recipient bacterium*
- *The bacteriophag enters the donor bacterium DNA it is carrying in to recipient bacterium*
- *Homologous recombination occurs and the donor bacterium DNA is exchanged for some of the recipient DNA.*

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Q No:5 (symbiotic relationship)

1. *Symbiosis refers to relationship between organisms of different species that show an intimate association with each other.*

Symbiotic relationship provides at least one of the participating species with a nutritional advantage.

2. (Antimicrobial drugs)

- *Amoxicillin*
- *Ampicilline*
- *Cephalexin*
- *Penicillin*
- *Erythromycin*
- *Doxycycline*
- *Tetracycline*
- *Ciprofloxacin*
- *Ofloxacin*

3rd.(Antimicrobial resistance)

Antimicrobial resistance happens when microorganisms (such as bacteria,fungi, virus, and parasites) changes when they are exposed to Antimicrobial drugs (such as antibiotics, antifungal, antiviral, antimalarial and anthelmintic).microorganisms that develop Antimicrobial resistance are sometimes referred to as " superbug ".

4. (probiotics)

Probiotics are a combination of live beneficial bacteria and or yeast that naturally live in your body. Bacteria is usually viewed in a negative light as something that makes you sick. Probiotic are good bacteria is to maintain a healthy balance in your body in neutral. Think of it as keeping your body in neutral. When you are sick bad bacteria enters your body and increase in number.

5. (prebiotics)

Prebiotics are compounds in food that induce the growth or activity of beneficial microorganisms such as bacteria and fungi. The most common example is in the gastrointestinal tract, where prebiotics can alter the composition of organisms in the gut microbiome.

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