MICROORGANISMS: NORMAL FLORA AND PATHOGENS

BELL WORK- DEFINE THE FOLLOWING TERMS USING THE RED DHO BOOK. CHAPTER 14

MICROORGANISM  BACTERIA  PROTOZOA  FUNGI  RICKETTSIAE   VIRUS
PATHOGEN  NON-PATHOGEN
15) CORRELATE THE FUNCTION OF NORMAL FLORA WITH HOMEOSTASIS AND RELATE DEVIATION TO DISEASE STATES. EVALUATE SPECIFIC MEASURES TO PREVENT DEVIATION THAT ARE ALIGNED WITH ACCEPTED STANDARDS OF CARE.
OBJECTIVES:

AT THE CONCLUSION OF CLASS TODAY I CAN:

• DIFFERENTIATE BETWEEN NORMAL FLORA AND PATHOGENS

• CORRELATE THE FUNCTION OF NORMAL FLORA AND HOMEOSTASIS BY POSITIVE AND NEGATIVE FEEDBACK.

• EXPLAIN THE DEVIATION OF THE BODY’S HOMEOSTASIS TO AN ASSIGNED PATHOGEN BY CREATING “A MOST WANTED PATHOGEN” POSTER
NORMAL FLORA AND PATHOGENS

• A **MICROORGANISM** is an extremely tiny organism seen only by using a microscope.

• Microorganisms that cause disease are called **PATHOGENS**.

• Not all microorganisms cause disease or are “pathogenic”.

• Harmless microorganisms on and in our body are called “**NON-PATHOGENS**” microorganisms.

• The microorganisms that naturally live on or in our body are collectively called the body’s **NORMAL FLORA**.
NORMAL FLORA AND PATHOGENS

IN FACT NORMAL FLORA ACTUALLY FIGHTS OFF THE BAD PATHOGENS THAT TRY TO ENTER OUR BODIES.

Normal Flora is also called the body’s MICROBIOME.

Let’s check out the video!
FIST to FIVE Check

1. I completely understand
2. I mostly understand
3. I understand pretty well
4. I could use more practice
5. I need help
6. I don't understand at all
NORMAL FLORA AND PATHOGENS

• IF OUR “GOOD” MICROORGANISMS MOVE TO A DIFFERENT PART OF OUR BODY OTHER THAN WHERE THEY NORMALLY RESIDE, THEY MAY BECOME PATHOGENIC. EXAMPLE: THE BACTERIUM CALLED ESCHERICHIA COLI. E COLI IS PART OF THE NORMAL FLORA OF THE LARGE INTESTINE. IF E COLI ENTERS THE URINARY SYSTEM, THEN IT CAUSES AN INFECTION KNOWN AS A UTI.

• THIS IS THEN CONSIDERED A DEVIATION OF THE BODY’S NORMAL STATE OF HOMEOSTASIS.

• WHAT IS HOMEOSTASIS?
• NOW WITH YOUR TABLE PARTNER COMPLETE YOU AMOEBA SISTERS WORKSHEET.

• YOU WILL HAVE 15 MINUTES TO COMPLETE. THEN WE WILL DISCUSS YOUR ANSWERS.
PATHOGENS

• REQUIRE NUTRIENTS, MOISTURE, WARMTH, AND NEUTRAL PH TO GROW AND THRIVE

• AEROBIC PATHOGENS REQUIRE OXYGEN TO SURVIVE

• ANAEROBIC PATHOGENS REQUIRE OXYGEN-FREE ENVIRONMENT TO SURVIVE
TYPES OF PATHOGENS

• FIVE MAIN TYPES OF PATHOGENS:
  • VIRUS
  • BACTERIA
  • FUNGI
  • RICKETTSIAE
  • PROTOZOA
VIRUS

- **VIRUSES**
- **SMALLEST** TYPE OF MICROORGANISM. THEY ARE MADE UP OF ONLY A FEW MOLECULES.
- **VIRUSES** INVADE THE CELLS OF A LIVING ORGANISM WHERE THEY REPRODUCE MORE VIRUSES.
- **MORE THAN 400 TYPES**
- **VIRAL INFECTIONS/DISEASES**- COMMON COLD, FLU, RHINOVIRUS, NOROVIRUS, CHICKEN POX, MEASLES, HERPES, HEPATITIS B AND C, HIV, AND AIDS
- **BASED ON WHAT YOU HAVE LEARNED FROM PREVIOUS CLASSES, WOULD A DOCTOR PRESCRIBE ANTIBIOTICS TO FIGHT A VIRAL INFECTION?**
BACTERIA

- **BACTERIA**
- **ONE-CELLED MICROORGANISMS CLASSIFIED BY SHAPE.**
- **THREE TYPES:**
  - **COCCI**—ROUND SHAPE
  - **BACILLI**—ROD SHAPE
  - **SPIRILLA**—SPIRAL SHAPE
- **SPORES** are thick-walled cells created by bacteria to aid in reproduction and to make the bacteria resistant to harsh environments. SPORES can result in serious illness.
- **BACTERIAL INFECTIONS** - STAPH INFECTIONS, STREP THROAT, PNEUMONIA, CHOLERA, AND GONORRHEA
On your guided notes draw one example of each type of bacteria for reference. You do not have to know all of the names in each category.
FUNGUS

• **FUNGI** - PLANT-LIKE MICROORGANISMS THAT CAN BE FOUND IN THE AIR, IN SOIL, ON PLANTS, OR IN WATER.

• YEAST, MOLD, AND MUSHROOM

• MANY PRESENT IN BODY’S NORMAL FLORA

• MANY DO NOT CAUSE DISEASE

• FUNGAL INFECTIONS - ATHLETE’S FOOT, RINGWORM, THRUSH, AND YEAST INFECTIONS
And....what is this?
Why does it have this name?
RICKETTSIAE (PARASITES)

• **PARASITE** - CAN INFECT EYES, NOSE, BRAIN, INTESTINES
• DERIVE A BENEFIT FROM THEIR HOST WITHOUT GIVING ANYTHING BACK

2 TYPES

1. **ECTOPARASITES** (OUTSIDE): FLEAS, MICE, MOSQUITOS, TICKS
   PASS ON DISEASES LIKE MALARIA, ROCKY MOUNTAIN SPOTTED FEVER, AND TYPHUS

2. **ENDOPARASITES** (WITHIN): TAPE WORMS, ROUND WORMS
   EATING UNDERCOOKED MEAT AND DRINKING CONTAMINATED WATER.
PROTOZOA

• PROTOZOA— THE SIMPLEST ORGANISMS IN THE ANIMAL KINGDOM. SINGLE-CELL

• LIVE MAINLY IN SOIL

• SPREAD THROUGH FECAL–ORAL ROUTE BY INGESTED CONTAMINATED FOOD OR WATER

• SOME SPREAD BY MOSQUITOES OR OTHER INSECTS

• MOST PROTOZOA NEED MOISTURE TO SURVIVE, SO THEY ARE OFTEN FOUND IN WATERY ENVIRONMENTS.

• DISEASES – MALARIA, DYSENTERY, AND AFRICAN SLEEPING SICKNESS
Mosquitos (an Ectoparasite) transmit Malaria by sharing an endoparasite, plasmodium.
PROJECT: PATHOGEN WANTED POSTERS

- RESEARCH PATHOGEN AND PRODUCE A “WANTED POSTER”
- MUST SIGN UP FOR YOUR PATHOGEN.
- THIS WILL BE DUE FRIDAY 9/13/19.
TAKE OUT A BLANK PIECE OF PAPER
WHAT DID YOU LEARN?

1. WHAT ARE THE HARMLESS MICROORGANISMS ON AND IN OUR BODY ARE CALLED?

2. DEFINE HOMEOSTASIS AND GIVE ONE EXAMPLE OF POSITIVE FEEDBACK AND ONE EXAMPLE OF NEGATIVE FEEDBACK.

3. WHAT ARE THE MICROORGANISMS CALLED THAT CARRY HARMFUL DISEASES?

4. CAN “GOOD” MICROORGANISMS BECOME “BAD”? EXPLAIN.

5. WHAT IS THE DIFFERENCE BETWEEN VIRUS AND BACTERIA? HOW IS THE TREATMENT DIFFERENT? LIST ONE EXAMPLE OF EACH.
EXIT TICKET

• CREATE A #HASHTAG THAT SUMMARIZES TODAY’S LESSON
(Circle) Something that is still going around in your head

(Triangle) Something pointed that stood out in your mind

(Square) Something that "squared" or agreed with your thinking
INDIVIDUAL EXTENDED LEARNING:
THE BENEFIT OF PROBIOTICS

• GO TO THE CLASS WEBSITE AND SELECT THE TAB ON PROBIOTICS, READ AND THEN ANSWER THESE QUESTIONS:

• DESCRIBE WHAT PROBIOTICS ARE AND GIVE A FEW EXAMPLES OF FOODS THEY ARE FOUND IN.

• WHAT ARE PREBIOTICS? (YOU MAY NEED TO CLICK THE TERM WITHIN THE ARTICLE TO THE LINK CONCERNING PREBIOTICS)

• LIST THE COMMON FORMS AND A BRIEF DESCRIPTION OF EACH.

• DESCRIBE THE OVERALL BENEFITS OF PROBIOTICS IN 5 QUALITY SENTENCES.

• FINALLY, ARE THERE ANY CAUTIONS TO TAKE CONCERNING PROBIOTICS?