Name: KEY

**Microbiology Chapter 1**

**Review Outline 18-19**

1. Fill in the table below regarding scientists. Make sure to include details of their work. The more thorough you are the more benefit you will see on test day.

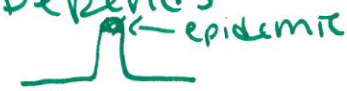
| Scientist | Discovery/Famous for | Definitions<br>Details |
|---|---|---|
| Pasteur (3) | Disproving spontaneous generation and replacing this theory with biogenesis.<br>- Pasteur designed the gooseneck flask which allowed air into the flask while keeping microbes out.<br> <br> | Spontaneous Generation - life comes from nonliving matter.<br><br>Pasteurization - Heating food substances to a safe temperature to kill microbial life.<br>Fermentation - converting sugar to alcohol to make beverages / fuel. |
| Jenner (4) | Created the first vaccine against smallpox by using cowpox to protect people against smallpox.<br><br>• vaccine = killed, inactive, or attenuated microbes designed to induce artificial immunity. | Immunity - the body's resistance against a pathogen.<br>• Active - you make antibodies post disease/vaccine.<br>• Passive - you are given antibodies (short term protection: breast milk, placenta).<br>• Natural - you make the antibodies (you had the disease).<br>• Artificial - you are given antibodies (shot/nose spray). |

| | | |
|---|---|---|
| Lister (1) | Performed the first aseptic surgery (using alcohol) | • Examples of Aseptic Technique<br>• Lysol tables, wash/hand-sanitize, autoclave |
| Fleming (1) | Discovered the first antibiotic (penicillin) | • Penicillin - 1st antibacterial agent. |
| Koch (5) | Purpose of Postulates: to prove that a specific microbe is responsible for causing a specific disease.<br>Explain these postulates through the lens of Lab 41.<br>• Postulate 1 - Is the same pathogen present in all of the diseased oranges?<br>• Postulate 2 Can we isolate the pathogen causing the sickness in the oranges?<br>• Postulate 3 Can we use the isolated pathogen to infect a healthy orange?<br>• Postulate 4 Can we reisolate the pathogen from the new host? Is it the same pathogen initially present? | Diseases Studied<br>• Anthrax - cattle<br>• TB - humans<br><br>Exceptions<br>(1) Too fastidious<br>- Leprosy<br>- Syphilis<br>(2) One disease is caused by a # of microbes.<br>- Diarrhea<br>- pneumonia<br>- UTI<br>(3) Some microbes can cause various diseases<br>- Group A Strep<br>- Mycobacterium tuberculosis<br>- E-coli<br>(4) Ethical issues<br>- HIV<br>- smallpox<br>- polio |

2. Understand and be able to identify the following terms related to disease transmission in scenarios.

| Term | Definition | Example |
|---|---|---|
| Vector(2) | An arthropod/insect that carries a pathogen between hosts but does NOT get the disease. | Lyme → Tick<br>Malaria → Mosquito |
| Reservoir (1) | A site where infection/disease is continuously present. | Rabies → Bats + Skunks<br>Tetanus → Soil<br>Cholera → Water |
| Host | An infected organism showing signs of disease/infection. | Lyme → Humans |

3. Understand and be able to identify the following terms related to diseases occurring in the population.

| Term | Definition | Example |
|---|---|---|
| Remerging (3) | Diseases that were once a problem, then they declined dramatically, but are again becoming health problems. | · TB<br>· schistosomiasis |
| Emerging (1) | "New"/ Relatively new diseases among humans. | · AIDS<br>· Lyme Disease<br>· CJD<br>· Legionnaire |
| Epidemic (2) | A disease that increases suddenly in a population | Depends   |
| Pandemic (2) | A worldwide epidemic | influenza (1918-1919) |
| Endemic (1) | A disease that is constantly present in a geographic area (never significantly declines). | · pneumonia<br>· polio<br>· plaque<br>· strep<br>· guinea worm |

4. Describe the relationship between pathogenicity and virulence (2).

The ability of a microbe to evade the defenses of a host.

- ↑ pathogenicity / virulence = very contagious and deadly (evade the immune system and are easily spread).

5. Fill in the table for Genus and Species classification (2).

| | Genus (Circle which apply) | Species (Circle which apply) |
|---|---|---|
| | Capitalized or Not | Capitalized or Not |
| | Underlined or Not | Underlined or Not |
| Examples: | Entamoeba | coli |

6. Fill in the table below regarding various designations of microbial life.

| Organism Category | Unique/Classifying Criteria | Examples | (If applicable) How to Inherit/Transmit | (If applicable) How to Treat |
|---|---|---|---|---|
| **Virus (4)**<br><br>*How do virus's reproduce?<br>use host cell machines. | -non-living<br>· not a cell<br>· can't reproduce without a host<br>- made of:<br>① protein coat<br>② nucleic acid genome<br>* DNA or<br>* RNA | · HPV<br>· HIV<br>· flu<br>· common cold | · contact with an infected person<br>-bodily fluid contact<br>-inhalation | · Time (NO antibiotics)<br>· manage symptoms<br>-including tumors<br>*oncogenic |
| **Bacteria Types (9)**<br>*How do bacteria reproduce?<br>· binary fission (asexual)<br>· sexual<br>1. Prokaryote Bacteria | • uni-cellular<br>• no nucleus<br>• no membrane bound organelles<br>• various shapes<br>• peptidoglycan cell wall. | Ecoli | contact/ ingestion of contaminated food/water.<br>* containing intestinal matter/fecal matter<br>-beef, spinach, unpasteurized beverages | Antibiotics<br>* sometimes<br><br>Time<br>- manage symptoms<br>- prevention<br>-cook meat thoroughly<br>-wash produce. |
| 2. Prokaryote Archea Bacteria | • uni-cellular<br>• no nucleus<br>• no membrane bound organelles<br>• NO cell walls<br>-membranes made of pseudomurein | 1). Methanogens<br>-produce $CH_4$<br>2). Halophiles<br>- salt lovers<br>3) Thermophiles<br>- temp. lovers use sulfur. | | |
| **Eukaryotic Fungi Types (11)**<br>*What is the study of fungi?<br>Mycology | | | | |
| 1. Uni-Cellular | • Chitin cell walls<br>• Heterotrophs<br>• Reproduce sexually & asexually<br>o pportunistic - infect when normal flora are destroyed. | • yeast<br>-thrush<br>-vaginitis<br>-diarrhea | Destruction of normal flora | Reintroduce normal flora<br>-yogurt. |

| Organism Category | Unique/Classifying Criteria | Examples | (If applicable) How to Inherit/Transmit | (If applicable) How to Treat |
|---|---|---|---|---|
| **Eukaryotic Fungi Types Continued**<br><br>2. Multicellular | • chitin cell walls<br>• Heterotrophs.<br>• Reproduces sexually and asexually. | • molds<br>• mushrooms | | |
| **Helminths (2)**<br>Eukaryotes | • parasitic<br>• complex life-cycle<br>• multicellular animal | • Tapeworm<br>• Heartworm (Filarial)<br>• Pinworms<br>• Whipworms | • consuming contaminated food/water. | Hard to treat (since these are animals, their cells are very similar to our cells). |
| **Prions (6)** | Infectious proteins<br>- folding structure has been altered. | Mad Cow | Eat beef or feed contaminated with spinal cord material or brain matter.<br>* can't cook prions out | NO treatment<br>- prevention |
| | | Creutzfedlt Jacobs | • random mutations<br>• genetic history<br>• unclean/contaminated surgical equipment | NO treatment |
| **Protozoa (2)**<br>Eukaryotes | • Uni cellular<br>• NO cell wall<br>• Reproduce sexually and asexually<br>• move | Giardia<br>Amoeba<br>Malaria | contact with contaminated water<br>passed by insect vector | Hard to treat<br>- very similar to our cells. |