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c) A few bacteria experienced random mutations in their DNA, which allowed some of them to grow even though antibiotics were present

d) The bacteria mutated as a survival response to the presence of antibiotics, enabling the bacteria to become resistant to the antibiotics

c) A few bacteria experienced random mutations in their DNA, which allowed some of them to grow even though antibiotics were present

Which of the following contributes the LEAST to the problem of antibiotic resistance?

a) stopping taking the antibiotics as soon as you feel better, thereby decreasing the exposure of the bacteria to the antibiotics

b) taking antibiotics for all infections, including viral infections

c) taking the entire course of antibiotics as prescribed by the doctor

d) using high doses of antibiotics in animal feed, so that we are not exposed to the bacteria

c) taking the entire course of antibiotics as prescribed by the doctor

A particular antibiotic kills 99% of a bacterial population. What will be the result of the continued application of this antibiotic?

a) Over time, the antibiotic will become less effective at killing the bacteria

b) Over time, the antibiotic will cause mutations in the bacteria

c) Every time the antibiotic is given, it will kill 99% of the bacterial population

d) Eventually, all of the bacterial population will be wiped out

a) Over time, the antibiotic will become less effective at killing the bacteria

e) It catalyzes the formation of DNA from an RNA template

We have an expert-written solution to this problem!

What is the source of a viral envelope?

- a) host cell DNA
- b) prophages
- c) provirus
- d) host cell membrane
- e) viral glycoproteins
- d) host cell membrane

We have an expert-written solution to this problem!

which of these is reverse transcriptase

- a) a *glycoproteins: outer part-- looks like a plunger*
- b) b *lipid bilayer envelope: outermost part of the virus*
- c) c * reverse transcriptase: 2 yellow circles in the center of the virus*
- d) d *core proteins: purple beads encasing where genetic material is held*
- e) e *generic material- viral RNA- coated with proteins: looks like thick squiggle pieces*
- c) c

which of these is the viral genome

- a) a *glycoproteins: outer part-- looks like a plunger*
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- e) e

Which of the following has no organelles, ribosomes, or cytoplasm?

- a) virus
- b) cyanobacterium
- c) bacterium
- d) alga
- e) plant
- a) virus

Antibiotics can be effective only against a

- a) prion
- b) virus
- c) bacterium
- d) viroid
- c) bacterium

Bovine spongiform encephalopathy, or mad cow disease, is caused by a

- a) bacterium
- b) prion
- c) virus
- d) viroid
- e) fungus
- b) prion

Which is the correct sequence of viral replication?

- a) Penetration - genetic material replication - transcription - protein synthesis - assembly

Many environmental bacteria are able to produce stable dormant, or resting, forms as a branch of their life cycle to enhance their survival under adverse conditions

sporulation (interruption (dormant) of cell life cycle

endospores are created by what cell life cycle

sporulation

is cyanobacteria an example of an endospore?

yes (specifically a heterocyst)

The ability to form endospores is found among bacteria in a number of genera, predominantly gram-
_____ groups

positive

Bacillus is what shape? it is anaerobic or aerobic

rod and aerobic

clostridium is what shape? it is anaerobic or aerobic

rod and anaerobic

T/F:

The formation of a spore occurs in response to nutritional deprivation

T

is part of the healthy intestinal microbiota. However, overgrowth of the bacteria due to prolonged intake of antibiotics (such as fluoroquinolones, clindamycin, and penicillin) disrupts the balance of colon microbiota, causing pseudomembranous colitis.

C. difficile

endospores cause four significant types of botulism syndrome according to the mode of infection ex: Foodborne botulism is caused by contamination of food with bacterial endotoxin and spores

C. botulinum

bacterial infection caused by contamination of open wounds (contaminated puncture wounds, infected foot ulcers, surgical wounds, and animal bites)

C. tetani

What are some of the factors that an endospore forming bacteria tolerate and resistant to chemical agents, e.g., triphenylmethane dyes, and can even protect the bacterial cells against ultraviolet radiation, extreme pH gradients, drought, and nutrition depletion

Endospores germinate back into vegetative cells (an active bacterial cell that undergoes metabolism) when surrounding environmental conditions (do not favor/favor) bacterial growth and reproduction.
favor

Dr. Nemo just got a cut from a piece of sharp tool in his 200 years old citadel. What should Dr. Nemo be aware of getting himself exposed to

tetanus

Botox and Honey and Endospores have something in common! What was it that we discussed in class

botulism

We have an expert-written solution to this problem!

T/F:

A biofilm structure when formed give bacteria the protection it needs to survive under various stress conditions (ranging from antibiotic resistance to ultraviolet radiation)

T

(biofilm= community of bacterial species that help each other thrive via releasing signals and attracts other microbial communities so it can layer itself and withstand antibiotics, heavy metal toxicity, UV, etc.)

What is Quorum Sensing and how is it related to biofilm

Quorum sensing=Chemical signals sent by bacteria to other microbial communities to increase biofilm density

A biofilm can be defined as a community of microbes that:

- a) Has a physical structure or architecture, like a city
- b) Includes many different species interacting together - like a jungle ecosystem
- c) Both of the above
- c) Both of the above

In natural environments, most microbes live:

- a) By themselves, as individual cells
- b) Within biofilm communities, alongside many other cells
- c) Microbes don't live outside of the laboratory
- b) Within biofilm communities, alongside many other cells

T/F:

Viruses have ribosomes

F

(viruses do not have ribosomes and cannot make proteins)

T/F:

viruses do not have a cytoplasm

T

T/F:

Viruses have no ability to synthesize organic molecules

T

T/F:

viruses can extract and use energy stored in organic molecules

F

(Viruses have no capacity to extract and use the energy stored in organic molecules)

T/F:

viruses can have both RNA and DNA

F

(can't have both rna AND dna)

T/F:

viruses can evolve but ONLY if they are successful in attaching to a host

T

Several bacteriophages attack the surface of a bacteria via transduction

T/F:

Bacteriophages mediate horizontal gene transfer through a mechanism known as transduction.

T

Can bacteria become antibiotic resistant because of a phage

Bacteria can develop resistance to phages, as they do to antibiotics. But because millions of genetically different phages can attack a specific bacterium, it's possible to create phage "cocktails" to prevent resistance, an approach similar to the use of antiviral drugs to treat HIV

T/F:

Many disease-causing bacteria become resistant to antibiotics, but phages remain effective because they evolved faster

T

Dr. Nemo found an interesting bacteriophage that carried a gene that could lead to de-activate antibiotic. He accidentally spilled the bacteriophage on to a bacterial culture of harmless E.coli!

1) What could happen to E.coli, could it become antibiotic resistance

2) How could it be possible that E.coli acquire that resistant gene from the bacteriophage?

1) If it is specific--- it will be Infected by the virus and will integrate genome via transduction and e coli will become antibiotic resistant

2) transduction

Can virus inject beneficial genes in humans

yes