In which of these environments would you normally find prokaryotes?

a) A single drop of seawater

b) An animal's intestinal tract

c) A spoonful of soil

d) Human skin

e) All of the above

e) All of the above

In terms of abundance, which of the following is Earth's predominant form of life?

a) prokaryotes

b) plants

c) reptiles

d) archaea

e) animals

a) prokaryotes

What is a major difference between the domains, Bacteria and Archaea?

a) the use of RNA polymerase for RNA synthesis

b) the presence of a plasma membrane

c) the use of ribosomes in protein synthesis

d) DNA as the genetic material

e) peptidoglycan in the cell wall of bacteria but not the archaea

e) peptidoglycan in the cell wall of bacteria but not the archaea

(Peptidoglycan is a polysaccharide that strengthens the cell wall of bacteria and is not found in archaea)

The rapid and inexpensive routine laboratory procedure used to classify the bacterial world into two major groups is called the _____.

a) Gram stain

b) use of electrophoresis to distinguish unique proteins

c) DNA sequencing

d) centrifugation

e) microscopy

a) gram stain

Which of the following genera contains spherically shaped bacteria?

a) Bacillus

b) Micrococcus

c) Treponema

d) Escherichia

e) Borrelia

b) Micrococcus

Life as we know it cannot flourish on the moon but it might be possible for it to survive. What life form on Earth might survive on the moon?

a) archaea

b) bacterial endospores

c) reptiles

d) spherical bacteria

d) protists

b) bacterial endospores

(Dormant endospores can survive even extreme environmental condition)

Which of the following statements best describes the end result of bacterial conjugation?

a) One cell has lost a plasmid, while the other cell has gained one

b) The two cells have had an equal exchange of plasmids

c) One cell has given a copy of a plasmid to another cell and kept one copy for itself

d) One cell has lost a chromosome, while the other has gained one.

c) One cell has given a copy of a plasmid to another cell and kept one copy for itself

From which cell does the sex pilus originate during bacterial conjugation?

a) The donor cell

b) The recipient cell

c) Both the donor cell and the recipient cell

a) The donor cell

We have an expert-written solution to this problem!

T/F: During bacterial conjugation, the recipient cell receives a single stranded loop of DNA

T

(One strand of the plasmid enters the recipient cell; this strand must be replicated in the recipient cell to produce a double stranded plasmid that can replicate independently of the bacterial chromosome)

We have an expert-written solution to this problem!

Which structure helps bacteria to attach within the tissues that they will infect?

a) Nucleoid

b) Capsule

c) Cell wall

d) Flagella

b) capsule

(The gelatinous capsule that covers some bacteria helps them attach to the tissues that they will infect)

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

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

d) Genetic material replication - penetration - transcription - assembly - protein synthesis

e) Transcription - penetration - genetic material replication - assembly - protein synthesis

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

We have an expert-written solution to this problem!

hat is a major role of the Centers for Disease Control and Prevention?

a) Clean, cook, and chill food for consumption

b) Monitor and report the state of the health of the U.S. citizenry

c) Test and otherwise monitor the drinking water supply in the United States

d) Monitor and investigate bioterrorism in the United States

e) Control health issues for all states within the United States.

b) Monitor and report the state of the health of the U.S. citizenry

What is the major difference between a virus and a viroid?

a) Viruses only infect humans, while viroids infect all animals

b) Viruses can replicate in cells, but viroids cannot

3) archaea

4) archaea (only in some-- bacteria has 0)

5) bacteria (archaea has several)

6) archaea

7) bacteria

what is a Phylogenetic tree?

a graphic representation of the evolutionary relationships of species, and the phylogenetic distances among the species reflect the closeness of evolutionary relationships

Dr. Nemo is trying to create a phylogenetic tree to compare between three bacterial species that he found in a soil sample. What data does he need to collect to help him construct a meaningful phylogenetic tree

16s DNA, gram test, habitat information, cell morphology, protein samples (amino acid sequences)

E.coli and Salmonella and Listeria can be commonly found in which kind of food source? List the food sources out

raw fruits/ vegetables, raw milk, raw/light cooked sprouts (beans, alfalfa, other sprouts)

(eggs= salmonella only

oysters= vibrio only)

Dr. Nemo had some raw oysters for lunch and then complained of stomach ache! Which bacteria is commonly found in raw oysters that could lead to food poisoning

vibrio

While handling raw eggs, which bacteria should we be careful about getting infection from?

salmonella

positive

(thick peptidoglycan layer)

Cell walls of _____ consist of thin layers of peptidoglycan and arabinogalactan, and a thick layer of mycolic acids

mycobacteria

double layer of porins and lipopolysaccharide

gram negative

(lipopolysaccharides)

mycolic acid= gram _____

negative

which gram stain is purple

positive

T/F:

The use of Gram stain facilitates the rapid use of appropriate antibiotics. However, genetic sequences and molecular techniques are more specific than classic gram stain.

T

What color does a gram negative bacteria appear under light microscope

red

(Gram-negative bacteria (left) have an outer membrane coated with lipopolysaccharides (green) and an inner cytoplasmic membrane separated by a thin peptidoglycan layer, which is bound to the

How do some bacteria detoxify Hydrogen peroxide

by using a catalyst to mediate the breakdown of hydrogen peroxide into oxygen and water (usually seen via bubbles)

How do some bacteria lyse RBC

hemolysin

(Hemolysin is one of the important virulence factors for S. aureus and causes the typical β-hemolytic phenotype)

what are the example bacteria that use catalyst to detoxify hydrogen peroxide?

Staphylococci, Listeria

what bacteria uses hemolysin to lyse RBC

S. aureus

Dr. Nemo got a flesh wound. He applied over the counter Hydrogen peroxide solution to disinfect the wounded area. However, he noticed it was not effective as it caused severe inflammation and pus formation looking like a bacterial infection. Why do you think hydrogen peroxide did not work

here was a catalyst that detoxified the hydrogen peroxide

We have an expert-written solution to this problem!

T/F:

all strains of bacteria can produce hemolysin toxin

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

C) Scientists are still uncertain exactly what happens to a person because of the foods that he/she eat

D) All of the above

B) Only a few microbial workers are required to break down the food (causing a less diverse gut microbial ecosystem)

_____ enzyme is important to catalyze and aid in fixation of nitrogen from the atmosphere into soil

Nitrogenase

The reduction of atmospheric nitrogen is a complex process that requires a large input of energy to proceed

The Nitrogen Fixation Process

T/F:

Rhizobium and Bradyrhizobia are important for fixing nitrogen fixation in soil

T

(fyI= both are gram negative)

Rhizobium and Bradyrhizobia are found in _____ plant root nodules

nitrogen fixed nodules of vigna angularis

P. aeruginosa NRRL B-5472 was created with help of gene transfer mechanism to harbor plasmids to degrade camphor, octane and salicylate and naphthalene some component found in crude oil ! By looking at the graph how can one tell this is happening?

a. The P. putida NRRL B-5473 was derived from Pseudomonas

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

Why should we be careful about eating meat contaminated with prion

consuming infected cow CAN cause protein misfolding and dementia

(fyI= if no misfolding occurs then humans have no symptoms)

T/F:

viroids can infect animals

F

_____ are infectious particles that lack a protein coat and consist of nothing more than short, circular strands of R N A

viroids

T/F:

Viroids can enter the nucleus of a host cell and direct the synthesis of new viroids

T

T/F:

Viral polymerases are more error prone than cellular polymerases

T

The only RNA viruses know to encode for a proofreading are the _____

coronaviridae

T/F: