This Tournament Goes To Eleven III: Smell The Glove

Hosted by the University of Iowa, October 12-13, 2001

The Wager Round II (by Mike Witry [Iowa])

RULES: This round was inspired by watching many episodes of "Name That Tune. It may seem odd at first, but the rules will make sense.

This round will not have toss-ups and bonii like other rounds. Instead, each question will begin with me reading a topic for this question, such as "Members of NATO." Then each team will select one team member to play on this question. The team who did not score on the previous question will begin bidding on how many questions they can answer, as in "I can name four members of NATO." Their opponent can then either increase the bid or call. This continues until someone calls or someone claims they can name all members of the list.

Once this happens, the person with the last bid must, within 5 seconds and with no consultation, begin naming list members, as in "USA, Canada, UK, Germany." This ends when their bid is fulfilled, they get one wrong, or they pause for five seconds.

The player will receive 5 points for each list member they name, but if they get one wrong or pause for 5 seconds, their opponents receive _all_ the points they claimed they could get. In the case above, if the player claimed he could name 10 members of NATO, and named 9 successfully before getting one wrong, their opponents would receive 50 points, and the player's team would get none.

These questions are spread over a variety of categories, and there are 900 total points, just like other packets in this tournament.
Time to begin, if you have no questions.

1. The 10 longest reigning British monarchs since 1066. (10 total) (MOD: Prompt for numbers on everyone but Victoria)

Victoria, George III, Henry III, Edward III, Elizabeth II, Elizabeth I, Henry VI, Henry VIII, Charles II, Henry I

2. Planetary moons of the solar system that are larger than Earth's Moon. (4 total)

Ganymede, Titan, Callisto, Io

3. Astronauts who died when the _Challenger_ exploded. (7 total)

Gregory Jarvis, Sharon McAuliffe, Ronald McNair, Ellison Onizuka, Judith Reznik, Francis Scobee, Michael Smith

4. Breeds of dog with a population of over 50,000 in the U.S., according to American Kennel Club registries. (7 total)

Labrador Retriever, Rottweiler, German Shepherd or Alsatian, Golden Retriever, Poodle, Cocker Spaniel, Beagle

5. Louisa May Alcott's "Little Women," and their husbands. (7 total)

Amy, Jo, Meg, Beth, Professor Fritz, John Brooke, Laurie

6. European cities with populations of over 3,000,000, including suburbs. (13 total)

Moscow, London, Paris, Istanbul, Essen, Milan, Madrid, St. Petersburg, Barcelona, Manchester, Athens, Rome, Berlin

7. The top 10 highest selling singles (NOT ALBUMS - SINGLES) of the 1980s in the U.S. (10 total)

We Are the World, Physical, Endless Love, Eye of the Tiger, I Love Rock 'n' Roll, When Doves Cry, Celebration, Another One Bites The Dust, Wild Thing, Islands in the Stream

8. U.S. national park lands that cover over 1 million acres. (NOTE: This refers to all areas under the authority of the National Park Service, be they National Parks, National Historical Parks, National Recreation Areas, or what have you.) (6 total)

Death Valley National Park, Glacier National Park, Glen Canyon National Recreation Area, Grand Canyon National Park, Lake Mead National Recreation Area, Yellowstone National Park

9. Stories in James Joyce's "Dubliners". (15 total)

The Sisters, An Encounter, Araby, Eveline, After the Race, Two Gallants, The Boarding House, A Little Cloud, Counterparts, Clay, A Painful

Case, *Ivy Day in the Committee Room*, *A Mother*, *Grace*, *The Dead*

10. Food crops with an annual harvest of over 200 million tons worldwide. (6 total)

Sugar cane, Corn, Wheat, Rice, Potatoes, Sugar beets

11. Not counting the bones of the inner ear…Bones of the human skull. (13 total)

Parietal, Frontal, Lacrimal, Ethmoid, Temporal, Sphenoid, Vomer, Mandible, Maxilla, Zygomatic, Sphenoid, Nasal, Occipital

12. Countries in the world with more than 60 million Muslims. (5 total)

Indonesia, Pakistan, Bangladesh, India, Turkey

13. The biblical plagues of Egypt. (10 total) (Note to moderator: accept equivalents.)

Nile turns to blood, Frogs, Gnats or mosquitoes, Flies, Dead cattle, Boils, Hail, Locusts, Darkness, Dead firstborn

14. The nine Monopoly (TM) pieces, counting the new one. (9 total)

Hat or Tophat, Thimble, Shoe, Scottie dog, Iron, Horse and rider or Statue, Car, Wheelbarrow, Moneybag

15. United States presidents who did not attend college, a university, or a United States Military Academy. (10 total)

George Washington, Thomas Jefferson, Martin Van Buren, Zachary Taylor, Millard Fillmore, Abraham Lincoln, Andrew Johnson (Prompt on Johnson), Grover Cleveland, Harry Truman

16. Roommates on "Three's Company" - first names of characters, please. (5 total)

Cindy Snow, Terri Alden, Janet Wood, Jack Tripper, Chrissy Snow

17. The Fates, the Furies, and the Graces. (9 total)

Clotho, Lachesis, Atropos, Megaera, Tisiphone, Alecto, Aglaia, Thalia, Euphrosyne

18. Holst's "Planets". We need the full names of the works, not just the name of the planets. (Duh.) (7 total)

Mercury, The Winged Messenger, Venus, The Bringer of Peace, Mars, The Bringer of War, Jupiter, The Bringer of Jollity, Saturn, The Bringer of Old Age, Uranus, The Magician, Neptune, The Mystic

19. Nobel Prize winners in Literature, from 1990 to 1999 inclusive. (10 total)

Octavio Paz, Nadine Gordimer, Derek Walcott, Toni Morrison, Kenzaburo Oe, Seamus Heaney, Wislawa Szymborska, Dario Fo, Jose Saramago, Gunter Grass

20. Countries in Asia that are landlocked, not counting the Middle East. (11 total)

Afghanistan, Armenia, Bhutan, Kazakhstan, Kyrgyzstan, Laos, Mongolia, Nepal, Tajikistan, Turkmenistan, Uzbekistan

21. Musicals that have won the Pulitzer Prize for Drama. (6 total)

Of Thee I Sing, South Pacific, Fiorello, How To Succeed In Business Without Really Trying, A Chorus Line, Sunday In The Park With George, Rent

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Wee Science (by Frank Swoboda [Iowa])

1. Some call these organisms "extremophiles," referring to their proclivity to high temperature, high salt, or high/low pH environments. Others in the group are the CH4-producing methanogens. There are two major sublineages of these wacky organisms: Crenarchaeota (KREN-ar-key-ota), which are mostly hyperthermophilic, and Euryarchaeota (YU-ree-ar-key-ota). Another kingdom - Korarchaeota (CORE-ar-key-ota)- branches off at the root. It's only a 20-year-old concept and the newest "domain," along with Bacteria and Eukarya, but as the name suggests, FTP the microorganisms in this group might actually be the most ancient of all cellular forms.

Archaea

2. Supported by the experiments of Francesco Redi and John Needham, it was disproved in 1859 with the help of guncotton filters, an ether/alcohol mix, and a specially designed flask. By filtering air through the guncotton and then examining the results, it was proven that microbial cells exist in air; by placing nutrient solution inside the open but curve-necked flask, it was proven that the cells and not the air itself encouraged putrefaction. Thus Louis Pasteur debunked, FTP, this theory that bacteria arise unprompted from nonliving materials.

Spontaneous generation

3. Caused by a member of the genus *Orthopoxvirus*, there are two strains of it - variola major, with fatality between 30 and 40%, and variola minor, with fatality below 5%. Despite its high profile as the first virus to be studied in any detail, most of what is known about it is derived from its cousin vaccinia (va-KEE-nia) virus, which infects cattle to a larger degree than it does humans but with similar results - a brief infection, followed by immunity. By extending this principle, the virus causing FTP this disease was the first to receive a vaccine in 1798 and the first to be effectively eradicated in 1977.

Smallpox

4. One strain of the bacterium R. Rickettsia causes typhus; however, another strain contains 18 known species that cause this disease. The bacteria must grow inside a human host-cell, often invading the nucleus or cytoplasm of the cells lining the smaller blood vessels; constant reproduction and growth weaken the cell membrane, leading to blood leakage and a rash. Also characterized by muscle pains and high fever, about 800 people are infected each year with, FTP, this tick-borne, disease endemic throughout North America, and not just the Western U.S. region after which it is named.

Rocky Mountain spotted fever

5. One prerequisite for this process is the near-toxic level of present oxygen to convert to hydrolytic enzymes. Next, the cell converts from aerobic to anaerobic respiration, which allows for the production of lactic acid to lower internal pH and make the enzymes function more efficiently. The cell engulfs the pathogen, and its lysosomes fuse with the pathogen to create a phagolysosome in which the foreign microorganism is completely digested. This describes, FTP, what process of cellular digestion, part of maintaining immunity, whose name literally means "eating the cell."

Phagocytosis

6. Like brown and golden algae, they store food as a glucose polymer called laminarin or in the form of oil. Unlike brown and golden algae - or any other protists - they are unusually heavy; thus the special ion-regulating mechanism to maintain buoyancy in water. At the end of their life cycle, the organic matrix decomposes and the dense cell walls pull these organisms to the ocean floor, where their fossils form a silicate-rich sediment, valuable as a filter or an abrasive. FTP identify this type of algae, known for its glasslike external shell.

Diatoms or *bacillariophytes*

7. Earl Sutherland's 1971 work with this animal hormone led to the discovery that cell communication is actually a three-step process, after his tests showed that the hormone could only activate glycogen phosphorylase *within* a cell. The reason? It was only the "first messenger;" the second messenger being cyclic AMP, which induces the production of glucose as energy to support the famous "fight or flight" response. FTP identify this hormone, secreted in namesake glands sitting atop the kidneys.

Epinephrine or *adrenaline*

8. Her discovery won her a Nobel Prize in 1983 - over three decades after she had first postulated the existence of "controlling elements." Her initial papers, arguing that genetic elements were capable of changing places within the genome, were met with indifference, if not mockery, until the discovery of transposons backed up her explanation of why her Indian corn changed colors. FTP identify this American geneticist, whose experiments at Cold Spring Harbor first hinted at the possibility of "jumping genes."

Barbara *McClintock*

9. A number of gram-negative, polarly flagellated rods possess this interesting property. Most are marine, classified in the geni *Photobacterium* or *Vibrio*, and living in a symbiotic relationship with varities of fish. The phenomenon only occurs in the presence of O2; also required is the enzyme luciferase, activated when the bacteria colony reaches a critical mass. Luciferase is the medium through which the electrons from NADH pass before being converted into light energy. This is one example of FTP this phenomenon, especially helpful to deep-sea life, the production of light by living organisms.

Bioluminescence

10.Over 80% of the human population is infected with this virus type, most often found in a state of latency. Only when the virus is reactivated - for instance, Type 1 by stress or an unusually large intake of vitamin C - does it spread. Type 2 is more likely to reactivate spontaneously, triggered by specific genes which counteract host immune responses. Type 1, favoring the lip and facial areas, invades the trigeminal ganglion, while Type 2 attacks the axon in the sciatic nerve, allowing for it to migrate to the genital area. FTP name this virus type, causing canker sores and its own brand of STD.

Herpes simplex virus

11. The result of this process - which can occur once every twenty minutes if a particular prokaryote is especially speedy - will be two identical daughters; the only way anything changes is if the DNA is mis-transcribed, leaving one cell mutated. Normally, a bacteria's genetic material will copy itself, the copies move to opposite ends of the cell, and the parent cell splits. Thus takes place, FTP, this self-descriptive process of prokaryote reproduction.

Binary fission

12. Those in the field of nanotechnology study the structure and function of this proteinous subunit in order to apply to other fields the "molecular switching mechanism" by which bacteria activate either left-helixes or right-helixes, depending on whether a "running" or "tumbling" action is sought. Not to be confused with tubulin, the protein filaments in eukaryotes, FTP, this is the protein whose strands in groups of 11 form a bacterial flagellum.

Flagellin

13. Scalded skin syndrome, impetigo, toxic shock, food poisoning, and bedsores are all variants of this form of microbial infection. The bacterium often lives on the skin of healthy humans with no effect; however, once it enters the body through a cut, open wound, or bedsore, it can lead to an infection. Treatment is generally through the antibiotic methicillin, but some bacteria have developed a resistance to the antiobiotic and can wreak serious havoc, especially when an immune system is weakened from a prior illness. FTP identify this infection, prevalent in hospitals and caused by the bacteria Staphylococcus aureus.

Staph

14. A woman with a DNA macromolecule cluster writes in to Dear Abby to ask how to learn more about what she's got on her hands. Abby advises her to first separate the molecules out and give this procedure a try. Mixtures of nucleic acids or proteins are placed in wells near one end of a thin slab of a polymeric gel. The gel is supported by glass plates and bathed in an aqueous solution. A charge is applied, and the electric field causes the molecules to move towards the opposite charge. Rate of motion depends on size; thus, FTP, this lab test is invaluable in separating out DNA molecules for further analysis.

Gel electrophoresis

15. The name is the same. Edwin was born in Lansing, Iowa, in 1918, and went on to, along with Edmond Fischer, isolate the process of reversible protein phosphorylation and show its role in regulating cell behavior and growth, for which he won the 1992 Nobel in Medicine. Hans Adolf was born in Germany in 1900; like Edwin, he studied cellular metabolism and regulation, and like Edwin, he won the Nobel for Medicine, in 1953. However, Hans Adolf's discovery is the more well-known, being, FTP, this cellular cycle which produces NADH and CO2 by way of pyruvate, acetyl CoA, and citric acid.

Krebs

16. This organelle performs a function similar to that of lysosomes - breaking down and disposing unwanted substances - which is facilitated by its membrane self-enclosure. Unlike the lysosome, however, it can compose up to 90% of the cell's volume. This ratio is not constant, however, as the organelle contracts and expands as necessary to help maintain the correct internal pressure to support the rigid cell wall. Identify FTP this fluid-filled sac unique to the plant cell.

Vacuole

17. In 1878, a pure culture of this organism was isolated, the first time an isolation process was successful. The result of the study carried out by Joseph Lister was the demonstration of the process by which lactose is passed into glucose before being transformed to lactic acid - all mediated by this species of bacterium. FTP identify this microorganism, the chief protagonist in the fermentation of milk and dairy products.

Bacterium *lactis*

18. The CDC advises vaccination for this *Bacillus* species for persons who import animal hides or furs from areas where standards are insufficient to prevent exposure; persons who handle potentially infected animal products in high-incidence areas; and military personnel deployed to areas with high risk for exposure to the organism. 95% of cases are reported as a result of spores infecting the body through the skin; less common are cases caused by ingestion of undercooked meat or inhalation of microbes. FTP identify this microbiological infection, which has the government on alert due to the possibility of its use as a biological weapon.

Anthrax

19. Two theories exist explaining how they developed. One says that an ancestor's plasma membrane infolded to form the endomembrane system; another claims that self-supporting mitochondria and, later, chloroplasts entered an ancestral prokaryote through a process of serial endosymbiosis. Many now believe a combination of the two gave rise to such structures as the endoplasmic reticulum, the lysosome, the mitochondrion, and the nucleus, forming, FTP, this type of cell, featuring internal membranes and organelles.

Eukaryotes

20. Those who developed the technology, like Nan Unklesbay, object to the name by which it is best known, claiming that it misleads people into thinking it uses radioactive isotopes, when in fact it uses high-voltage electrons. The e-beam damages the DNA of microbes and makes them unable to reproduce, without doing any damage to the host substance; however, further handling can add new microbes to the treated food. FTP identify this process of wiping out food-borne microbes, also known as electric or cold pasteurization, which has angered many an EU protester in recent months.

Irradiation

Bonus Questions

1. Genes of related function are often located together, along with an operator and a promoter, on the chromosome, forming an operon. FFPE, name the two types of operon.

Repressible, Inducible

E. coli has an inducible operon that acts, in the presence of lactose, to allow for the synthesis of a metabolizing enzyme. FTP, name this operon.

Lac operon

For a final 10 points, the ensuing enzyme synthesis allows for lactose to be broken up into its two component monosaccharides. All or nothing, name both.

Glucose, galactose

2. "Retroviruses kick ass. They're sweet. You should definitely do a bonus on them." So said one budding microbiologist consulted for this packet, and so it shall be.

FFP: A retrovirus contains this type of nucleic acid as the carrier of its genetic information.

RNA

FFP: Retroviruses use this enzyme in replicating their RNA by means of a DNA intermediate.

Reverse transcriptase

Reverse transcriptase is also used by hepadnaviruses, which use an RNA intermediate in DNA replication. F15P, name the human disease caused by hepadnaviral infection.

Hepatitis B

Despite the diversity of genomal structure in viruses, it remains true that all genetic information flows from nucleic acid to protein. For a final 5, what name is given to this principle?

Central dogma of molecular biology

3. If you exhibit any of the symptoms in this bonus, seek a physician immediately.

5: It's now the most common STD in America; only recently were tests for the *C. trachomatis* bacterium developed, allowing for diagnosis and treatment. Marked by painful inflammation of the urethra and cervix, less-common effects can include swelling of the testicles, groinal lymph nodes, and rectum, as well as falliopian tube damage and possible blindness.

Chlamydia

10: Caused by the bacterium Treponema pallidum, incidence of this disease in the U.S. peaked at the time of WWII and has been falling steadily with the use of penicillin as a treatment. Effects include large lesions called chancres (shan-kruhs), out of which more of the cheeky buggers grow.

Syphilis

15: The human papillomavirus (HPV), while best known for causing cervical cancer, also can be transmitted sexually to infect basement epithelial cells of the sex organs. It induces the cells to proliferate locally and become keritanized, eventually forming a series of papillomae, the symptoms of this infection.

Genital warts

4. FTSNOP name these famous microbiologists.

10: He devised methods for identifying and studying bacteria and was instrumental in the fight against anthrax, cholera, malaria, and sleeping sickness, but his 1905 Nobel came for his use of tuberculin in testing for tuberculosis.

Robert *Koch* (coke)

These two men both devised vaccines against poliomyelitis; one, in 1955, used injections of the killed virus, while the other, in 1959, used living organisms taken orally to provide more immunity against infection. FFPE, name them.

Jonas *Salk* and Albert *Sabin*

Directly evaluating chemicals for their carcinogenic qualities is expensive and difficult, but his indirect test for the likelihood of a carcinogen to encourage mutation is much simpler and more accurate. Thanks to, FTP, this biologist's test, using bacteria strains and liver enzymes, many potential carcinogens have been identified.

Bruce *Ames*

5. Here's the procedure: Drop purple dye on a slide of fixed bacterial cells, then wash off after 30 secs., complex with iodine, and wash with alcohol. Rinse with water and add final pink stain. You have just performed, FFP, what common lab test?

Gram stain test

Following the gram-stain test, two types of cells become visible - one group, lacking an outer membrane, retains the purple dye, and the other, with an outer membrane, only appears pink. FFPE name these two groups of bacteria.

Gram positive cells, *gram negative* cells

The difference between the groups is in the amount of this structure in the cell wall. A thin sheet of sugar derivatives, three amino acids, and either lysine or diaminopimelic acid form the glycan tetrapeptide unit, which repeats to form this molecule. It can compose up to 90% of a gram-positive cell wall, but only about 10% of a gram-negative. F15P, name it.

Peptidoglycan

6. Viruses are tiny, but they're veritable giants compared to these funky protein particles, the smallest of pathogens, which replicate by inducing other proteins to fold abnormally. FTP, name them.

Prions

Prions are thought to have been the cause of this brain disease, which was spread among the Fore people of New Guinea by cannibalism and identified by American virologist Daniel Gajdusek (GID-shek). FTP, name it.

Kuru

Prions may also be at the root of the UK's own peculiar institution, mad-cow disease, or BSE. For a final ten, expand the acronym BSE.

Bovine spongifrom encephalopathy

7. It's like the song. Nitrogenous bases make the people come together, and nitrogenous bases make the bourgeoisie and the rebel. So get your nitrogenous-base freak on and name the four compounds found in DNA, 5 for 1, 10 for 2, 15 for 3, and 20 for all 4.

Adenine, Guanine, Cytosine, Thymine.

Now name the additional nitrogenous base, found only in RNA, and the DNA molecule it replaces, F5PE.

Uracil; replaces *thymine.*

8. Given a description of a disease transmitted via food, water, or fecal matter, name the organism that causes it FTSNOP.

5: The most common form of this bacteria, O157:H7, contains a potent toxin that can lead to hemorrhagic diarrhea and kidney failure - so keep that in mind next time you decide to undercook your hamburgers.

Escherichia coli

5: The most common cause of what is called "food poisoning," this pathogen type is carried largely in eggs, poultry, meat, and dairy products, grows in the intestine and can take days before triggering symptoms, which include vomiting, chills, headaches, and diarrhea.

Salmonella

10: This most severe type of food poisoning - and a possible cause of SIDS - is caused when bacterial spores of the genus *Clostridium* go untreated in food processing, reproduce, and produce a highly poisonous neurotoxin.

Botulism

10: Mild cases can be subclinical, but severe cases can result in jaundice. A picornavirus, spread through fecal contamination of foods, causes an inflammation of the liver by infecting host cells with its positive, single-strand RNA.

Hepatitis A

9. There are two phases in the cell cycle. FFP, name the shorter of the two, in which the cell replicates itself.

Mitosis

FTP, name the longer of the phases.

Interphase

These cells produce antibodies, which act to neutralize specific proteins the immune system recognizes as foreign.

B lymphocytes

These cells have specific antigen-binding sites, which allows the immune system to recognize antigens and, if necessary, build an immune response to them.

T lymphocytes

This type of T cell acts to shut down the immune response once levels of antigen begin to drop.

T-S cell or *suppressor* T cell

13. Answer the following regarding virus structure, FTSNOP.

A virus is composed of two parts - one, the genetic material. FTP, what name is given to the proteins that surround the viral genome?

Capsid

The virus can take one of two shapes, depending on how the nucleic acid interacts with the capsid protein. One is the result of the protein's adherence to the genome, in which the virus takes on, FFP, this shape of DNA, also a book by James Watson?

Double *helix*

For 15: The other option is for the protein to form this solid, 20-sided structure enclosing the genetic matter.

Icosahedron

14. In order to read this bonus, I had to take a breath of oxygen-rich air. FFP, what term did Pasteur give to organisms like myself that require oxygen for respiration?

Aerobes

We're all aerobes here; however, diversity should be not only tolerated, but celebrated, so, FFP, what term is given to our bacterial neighbors Streptococcus, Clostridium, and Enterobacteria, none of which require oxygen to respire?

Anaerobes

FTPE, name the two subcategories of anaerobic organisms - the first of which is poisoned in the presence of oxygen, and the second of which can exist in oxygenated environments.

Obligate, facultative anaerobes

15. Identify the sub-branch of microbiology FTSNOP.

5: It is the study of viruses and viral disease.

Virology

10: Scientists of this field concentrate on the life of and diseases caused by fungi.

Mycology

15: This branch is concerned with pollen and spores, both living and fossilized.

Palynology

16. Although this classification system is no longer used due to further study of bacterial genomes, for a long time, bacteria were typified based on cell shape, and many species still bear names based on this method. Given a term, FTP, identify the microbial shape. (accept equivalents)

Spirilla - *helixes*

Bacilli - *rods*

Cocci - *spheres*

17. 30-20-10, name the microbiologist.

30: In 1929, he went on vacation, remembering to turn off the heater in his lab before he left. The resulting change in temperature allowed for a rare sequence of bacterial lysis to take place among his cultures.
20: His discovery of lysozyme inspired Howard Florey and Ernest Chain in 1940 to isolate another substance described in his papers and use it to treat animal infections.
10: In 1945, Florey and Chain were awarded the Nobel along with this man for their role in developing penicillin, the first antibiotic.

Alexander *Fleming*

18.FTPE identify the following having to do with fungi.

While fungi depend on their external environment for food, most are not parasitic, but instead feed of already-dead material, assisting in the recycling of organic matter. What term is given to organisms with this pattern of feeding on decaying matter?

Saprophytes

Digestion is aided by these threadlike filaments making up a fungus, which secrete a special enzyme as they network through the base on which they feed.

Hyphae (prompt on *mycelium*)

This is the term for a fungus and plant root in symbiosis; its large surface area allows the fungus to suck up water and nutrients for the plant, from which it receives photosynthetic sugars in return.

Mychorrhizae

19. FTSNOP identify the following related infections.

5: It was originally known as GRID, when it was thought to only affect the "four H's": heroin addicts, hemophiliacs, Haitians, and homosexuals. The disease caused by HIV is now known as this.

AIDS

10: This parasite, while similar to protozoans, is actually a fungus. Its spores invade the lungs, where reproduction is easiest, but lesions in the spleen and the chest cavity are also signs of this illness, the most common infection of AIDS patients.

*P*neumocystis *carinii* or *PCP*

Although cats are the only known hosts for the protozoan's reproduction, the infection is also common in humans, who do not usually require treatment, except in cases of weakened immune systems. For a final 15, name this infection caused by Toxoplasma gondii.

Toxoplasmosis

20. 30-20-10, identify the technology.

30: Before a sample goes inside the vacuum column, it must be carefully prepared by a process that dries the sample out without shriveling it.
20: The next step is to plate the sample with gold in a sputter coater, in order that the sample will conduct electricity once it is hit with the electron beam.
10: The end result is a detailed picture of a miniscule object, produced by analyzing both the electrons scattered off and the secondary electrons produced by the sample.

Scanning electron microscope (*SEM*)