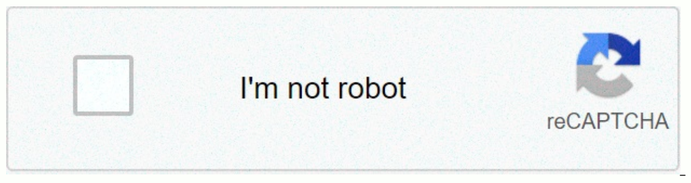

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Human immune system worksheet answers

This site provides information designed only for educational purposes. You should not rely on information on this site as a substitute for professional medical advice, diagnosis or treatment, or as a substitute for professional counselling, advice, diagnosis or treatment. If you have health concerns or questions, you should always consult your doctor or other medical professional. The immune system is a complex network of cells and organs that are essential for human health. In essence, it protects the body from infectious microorganisms such as viruses, bacteria and fungi. When these microorganisms enter the body, the immune system fights them. The world we live in is alive with pathogens and parasites. Our immune system is our defense against them. Sometimes this system requires assistance from medication, but whether actively protecting us from bacteria or promoting recovery, it is one of the major health systems and is essential for survival. Also known as leukocytes, white blood cells circulate through the whole body through blood vessels and lymphatic vessels. The lymphatic vessels move parallel to the arteries and veins of the circulatory system. White blood cells continuously patrol potentially harmful pathogens. When you encounter a target like a virus or bacteria, it starts to multiply. As they multiply, they send communication signals to other types of cells involved in the fight against pathogens, encouraging them to multiply as well. R_Type / Getty Images The lymphatic organ is like a storage center for white blood cells. These organs include the spleen, thymus, lymph nodes, and bone marrow. While these storage centers are essential for optimal immune system function, other tissues also play a role in storing and supporting the functioning of the immune system. For example, the tonsils, skin, throat, nose, and genital membranes are included. Of all organs of the immune system, the spleen is the largest. It is located in the upper left of the abdomen, in front of the diaphragm, in the back of the stomach. The size of the spleen can vary considerably, but on average it is the size of a fist. At any point, the spleen contains a significant amount of blood to filter as part of its immune system function. Also, as mentioned above, it is a storage center for white blood cells. ttsz / Getty Images Another lymphatic organ is located in the lower neck, where the thymus is located in front of the chest. This organ loses many of its active immune cells, so it decreases in size with age. The thymus is a storage center for white blood cells and plays an important role in the health of the innate immune system. The thymus also features hormone-releasing cells that tell T cells (lymphocytes) to grow. Cytes are cells that play a role in absorbing the functions of the immune system, surrounding pathogens, and decomposing them. There are various types ofThe most common is called a good ball. Their main function is to attack and fight bacteria. Macrophages are involved in patrolling dangerous pathogens, but they also help to get rid of dead and dead cells. Mast cells are involved in the defense against pathogens and promote wound healing. Dr_Microbe / Getty Images One of the unique features of the immune system is its ability to remember successfully fought pathogens. That's why people usually don't get the same cold virus twice or suffer repeated bouts of chicken pox. Lymphocytes allow the body to remember previous invaders. If these pathogens attack again, lymphocytes cause an immediate response. There are two types of lymphocytes in the body: B lymphocytes and T lymphocytes. The former produces antibodies. The latter destroys damaged cells in the body. Meletios Velas / Getty Images The basis of the immune response is the relationship between antibodies and antigens. Antigens are essentially invaders. When cells of the immune system recognize it as such, they begin to produce antibodies. Antibodies are a type of immunoglobulin, a protein that subsequently binds to a specific antigen. Each type of immunoglobulin is skilled in dealing with certain types of antigens, such as bacteria and other microorganisms. After immune system cells are alerted to these invaders, the immune system can level targeted attacks against them to protect the body. Courtneyk/ Getty Images Congenital immunity is the type of immunity that humans are born with. From the beginning, the immune system works to protect the body

from what it considers dangerous pathogens. Acquired immunity refers to the strengthening of the immune system. As we successfully fight certain viruses and develop protection against them, we call these developments adaptive or acquired immunity. MmeEmil / Getty Images The immune system is not without vulnerabilities. There are different ways in which this complex organization can be harmed. If damaged in any way, the immune system may not be able to protect the body. Excessive alcohol use and obesity are two conditions that can reduce the optimal functioning of immunity. The disease, known as AIDS, can interfere with the immune system and cause life-threatening dysfunctions. Autoimmune diseases, such as rheumatoid arthritis, cause the immune system to mistake the body's tissues for invaders. ttsz / Getty Images It is important to support optimal functioning, since the protection of the immune system from pathogens and infectious invaders that cause disease is an important part of life. Chronic stress can reduce immunity. Malnutrition, excessive consumption of alcohol, tobacco smoke and exposure to environmental toxins can tax the system. Following a nutritious diet containing probiotics, there is an amazing protective mechanism called helps maintain your body's immunity in your bodyThe immune system. It is designed to protect you from millions of bacteria, microorganisms, viruses, toxins and parasites that love to invade your body. To understand the power of the immune system, all you have to do is see what happens to something when it dies. It sounds gross, but it shows you something very important about your immune system. When something dies, its immune system (along with everything else) shuts down. Within a few hours, the body is invaded by all kinds of bacteria, microorganisms, parasites. None of these things go in when your immune system is working, but the door is wide open the moment your immune system stops. When you die, it only takes a few weeks for these creatures to completely dismantle your body and carry it away until all the rest are skeletal. Obviously, your immune system is doing something great not to cause all of its demolition when you are alive. The immune system is complex, complex and interesting. And there are at least two reasons why you should know more about it. First, it's obviously tempting to understand where it comes from when it happens in your body: fever, hives, inflammation. We also hear a lot about the immune system in the news as new parts are understood and new drugs come to market - knowing about the immune system makes these news stories easier to understand. In this article, you can see how your immune system works and understand what you do for you every day and what it is no longer. One of the causes we really notice in our immune system is when it fails for some reason. We also notice it when it does something with side effects that we can see or feel. Here are some examples: when you get cut, all kinds of bacteria and viruses enter your body through skin breaks. When you get debris, you also have pieces of wood as foreign bodies in your body. Your immune system responds to and eliminates invaders while the skin heals itself and seals punctures. In rare case, the immune system misses something and the cut becomes infected. It is inflamed and often filled with pus. Inflammation and pus are both side effects of the immune system doing its job. When mosquitoes bite you, you get a red, itchy bump. It is also a visible sign of your immune system at work. Every day, it inhales thousands of bacteria (bacteria and viruses) floating in the air. Your immune system treats all of them without problems. Occasionally, germs catch colds past the immune system, flu and worsen. Colds and flu are visible signs that your immune system has not been unable to stop the bacteria. The fact that you get over the cold and fluSign that your immune system was able to eliminate the invaders after learning about it. Eat hundreds of bacteria every day and again most of these die of saliva or stomach acid. But occasionally, a person passes through, causing food poisoning. Usually, there is a very visible effect of this violation of the immune system: vomiting and diarrhea are two of the most common symptoms. There are also all sorts of human diseases caused by the immune system working unexpectedly or in the wrong way. For example, some people have allergies. Allergies are really immune system that overreact to certain stimuli that others do not respond to at all. Some people have diabetes caused by the immune system improperly attacking cells in the pancreas and destroying them. Some people have rheumatoid arthritis, which is caused by the immune system acting improperly in the joints. In many different diseases, the cause is actually an error of the immune system. Finally, we sometimes look at the immune system because it prevents us from doing anything otherwise beneficial. Organ transplants, for example, are much more difficult than they should be because the immune system often rejects transplanted organs. Ads Let's start from the beginning. When someone says I feel sick today, what does it mean, what is a disease, and understanding different types of diseases can help the immune system handle what kind of diseases. When you get sick, your body will not work properly or to its full potential. There are many different ways for you to get sick - here are some of them: advertising mechanical damage - if you break a bone or tear a ligament, you become sick (your body can't perform to the fullest). The cause of the problem is easy to understand and see. Vitamins and mineral deficiencies - if you do not get enough vitamin D, the body can metabolize calcium properly, resulting in a disease called a coming disease. People with the disease have weak (easily broken) bones and deformities because they do not grow properly. If you don't get enough vitamin C, you're going to get scriveosis, causing swelling and bleeding of the gums, swelling of the joints and bruises. If you do not get enough iron you will get anemia, so the breakdown of the organs - in some cases the organs are damaged or weakened. For example, blockages in blood vessels that lead to heart muscles cause certain forms of heart disease so that the heart cannot obtain enough blood. One form of liver disease, called cirrhosis, is caused by damage to hepatocytes (drinking too much alcohol is one cause). Hereditary diseases - Hereditary diseases are caused by coding errors in DNA. Coding errorsToo many or too few proteins are made, causing problems at the cellular level. For example, albinism is caused by the lack of an enzyme called tyrosinase. Its missing enzymes mean that the body cannot produce melanin, a natural pigment that causes hair color, eye color or sunburn. Due to the lack of melanin, people with this genetic problem are very sensitive to ultraviolet rays of sunlight. Cancer - sometimes changes in the way it causes cells to regenerate uncontrollable. For example, when cells called melanocytes in the skin are damaged by ultraviolet rays of sunlight, they change in a way that is characteristic of the cancerous nature of the cells. Visible cancer, which appears as a tumor on the skin, is called melanoma. (For more information, see How tanning and tanning work.) Problems usually arise when viruses and bacteria (also known as bacteria) enter the body and breed. In general, the presence of germ produces some side effects that make you sick. For example, streptococcus (streptococcus) releases toxins that cause inflammation in the throat. Poliovirus releases toxins that destroy nerve cells (often causing paralysis). Some bacteria are both good or beneficial (for example, we all have millions of bacteria in our intestines, which helps us digest food), but many are harmful when they enter the body or bloodstream. Viral and bacterial infections are the most common cause of the disease for most people. It causes colds, flu, cancer, mumps, malaria, AIDS, etc. Your immune system's job is to protect your body from these infections. The immune system protects you in three different ways: it creates barriers that prevent bacteria and viruses entering your body. If bacteria or viruses enter the body, the immune system makes itself at home and trys to detect and eliminate it before breeding. If a virus or bacteria begins to reproduce and cause problems, your immune system is responsible for eliminating it. The immune system also has some other important work. For example, your immune system can detect cancer in the early stages and eliminate it in many cases. One of the funny things about the immune system is that it works in your body all your life, but you probably know almost nothing about it. For example, you may have noticed that there is an organ called the heart in the chest. Who doesn't know they have a heart? But have you heard of your thymus? The immune system has a lot of obscure parts, so first of all,For all parts. The most obvious part of the immune system is what you can see. For example, the skin is an important part of the immune system. It functions as the main boundary between bacteria and your body. Part of your skin's job is to function as a barrier in much the same way that we use wraps to protect food. The skin is hard and generally impervious to bacteria and viruses. The epidermis contains special cells called Langerhans cells (mixed with melanocytes in the basal layer), an important early warning component in the immune system. The skin also secretes antimicrobial substances. These substances explain why you don't wake up in the morning with a layer of mold that grows on the skin - most bacteria and spores that land on the skin die quickly. Advertising your nose, mouth and eyes are also obvious entry points for bacteria. Tears and mucus contain enzymes (lysotems) that break down the cell walls of many bacteria. Saliva is also antibacterial. Because the nasal cavity and lungs are coated with mucus, many of the bacteria that are not immediately killed are trapped in the mucus and swallowed immediately. Mast cells also line the nasal passages, throat, lungs and skin. Any bacteria or virus that wants to get an entry into your body must first make it past these defenses. Once inside the body, the germ treats the immune system on a different level. The main components of the immune system: thymus spleen lymphatic bone marrow myelocyte antibody supplemental hormone let's take a look at each of these components in detail. The lymphatic system is most familiar to people, as doctors and mothers often check for swollen lymph nodes in the neck. It turns out that lymph nodes are just part of a system that spreads throughout your body in much the same way as blood vessels. The main difference between blood flowing in the circulatory system and lymph flowing in the lymphatic system is that the blood is pressurized by the heart and the lymphatic system is passive. There is no lymphatic pump like a blood pump (heart). Instead, the fluid eries into the lymphatic system and is pushed into the lymph nodes by normal body and muscle movements. This is very similar to the community water and sewerage system. Water is actively pressurized, sewage is passive and flows by gravity. Lymph is a clear liquid that bathes cells with water and nutrients. Lymph is plasma, a liquid that constitutes blood after deducting red and white cells. Think about it - each cell does not have its own folk blood vessels to supply it, but to survive you need to get food, water and oxygen. Blood transfers these substances through the capillary walls to the lymphatic vessels, and the lymph carries them to the cells. Cells also produce proteins and waste, and lymph absorbs these products and carries them. Random bacteria that enter the body alsoto this intercellular fluid. One task of the lymphatic system is to drain and filter these fluids to detect and remove bacteria. The fluid eventually arrives at the lymph nodes for processing, since the small lymphatic vessels collect the liquid and move it towards a larger container. Advertising lymph nodes include filtered tissue and a large number of lymph cells. When fighting certain bacterial infections, lymph nodes swell with bacteria and bacteria-fighting cells to the point where they can actually be felt. Therefore, swollen lymph nodes are a good sign that you have some kind of infection. When the lymph is filtered through the lymph nodes, it re-enters the bloodstream. The thymus lives in the chest, between the bone of the chest and the heart. It is responsible for producing T cells (see next section) and is especially important in newborns - without the thymus the baby's immune system will collapse and the baby will die. The thymus does not seem to be very important in adults - for example, you get rid of it and adults will live, since other parts of the immune system can handle the load. However, the thymus is especially important for T-cell maturation (as seen in the section of white blood cells below). The spleen spleen filters the blood in search of foreign cells (the spleen is also looking for old red blood cells that need replacement). Advertised bone marrow produces new blood cells in both red and white. In the case of red blood cells, the cells are completely formed in the bone marrow and then enter the bloodstream. In the case of some white blood cells, the cells mature elsewhere. The bone marrow produces all blood cells from stem cells. They are called stem cells because they can branch out and become many different types of cells - they are precursors of different cell types. Stem cells change into real specific types of white blood cells. Leukocyte leukocytes will be described in detail in the next section. Antibodies (also called immunoglobulin and gangmaglobulin) are produced by white blood cells. These are Y-shaped proteins, each responding to a specific antigen (bacteria, viruses or toxins). Each antibody has a special section (the tip of two branches of Y) that is sensitive to a particular antigen and binds in some way. When antibodies bind to toxins, they are called antitoxins (called anti-benin if the toxin comes from some form of poison). Binding generally disables the chemical action of toxins. When antibodies bind to the outer skin of viral particles or bacterial cell walls, they can stop their movement through the cell walls. Or a large number of antibodies bind to the invader, signaling to the complement that the invader must be removed. Five antibodies come in.Advertising Immunoglobulin A (IgA) Immunoglobulin D (IgD) Immunoglobulin E (IgE) Every time they see an abbreviation like IgE in an immunoglobulin G (IgG) immunoglobulin M (IgM) medical document, they know that what they are talking about is an antibody. For more information about antibodies, see the Antibody Resources page. The complement system is a series of proteins, as well as antibodies. There are millions of different antibodies in your bloodstream, each sensitive to a specific antigen. There are only a handful of proteins in the complement system, which float freely in the blood. Complements are produced in the liver. The complement protein is activated by antibodies, which work with (complement) antibodies and hence give them a name. They cause cell rising (rupture) and let the food cells know that the cells need to be removed. For more information about complements, see The complement system. Advertising There are several hormones produced by components of the immune system. These hormones are commonly known as lymphocytes. It is also known that certain hormones in the body suppress the immune system. Steroids and corticosteroids (components of adrenaline) suppress the immune system. Thymosin (believed to be produced by the thymus) is a hormone that promotes lymphocyte production (lymphocytes are a type of leukocyte - see below). Interleukin is another type of hormone produced by white blood cells. For example, Interleukin-1 is produced by macrophages after eating foreign cells. IL-1 has interesting side effects - fever and fatigue occur when it reaches the hypothalamus. The temperature rise of fever is known to kill some bacteria. For more information, see Symptoms of infection: Fever and IL-1. Tumor necrotic factor Tumor necrotic factor (TNF) is also produced by macrophages. It is important to heal because it can kill tumor cells and promotes the creation of new blood vessels. Interferon interferon interferes with viruses (hence the name) and is produced by most cells in the body. Interferon, like antibodies and complements, is a protein that allows cells to signal each other. When cells detect interferon from other cells, they produce proteins that help prevent viral replication in cells. You probably know the fact that you have red blood cells and white blood cells in your blood. White blood cells are probably the most important part of your immune system. And it turns out that white blood cells are actually a whole collection of different cells that work together to destroy bacteria and viruses. Here are all of the different types, names and classifications of white blood cells that work in your body: leukocyte lymphocyte cell cell cell cell cell cell cell helper T cell killer killer killer killer T cell natural killerAdvertising All of these different names learn and the function of each cell type takes a bit of effort, but once you understand it all, you can better understand scientific papers! All white blood cells are officially known as white blood cells. White blood cells, like normal cells in the body, actually behave like self-sustaining living single-celled organisms, which can move and capture things on their own. White blood cells behave very much like amoebas in their movements and can involve other cells and bacteria. Many white blood cells cannot split and regenerate on their own, but instead have a factory somewhere in the body that produces them. That factory is bone marrow. Leukocytes are divided into three classes: granulocytes - granulocytes account for 50% to 60% of all leukocytes. Granulocytes are divided into three classes: eosulocytes, eosophils and basophils. Granulocytes get their name because they contain granules, and these granules contain different chemicals depending on the type of cell. Lymphocytes - Lymphocytes account for 30% to 40% of all white blood cells. Lymphocytes are found in two classes: B cells (matured in the bone marrow) and T cells (matured in the thymus). Monocytes - monocytes account for about 7% of all white blood cells. Monocytes evolve into macrophages. All leukocytes begin with the bone marrow as stem cells. Stem cells are common cells that can form into many different types of white blood cells as they mature. For example, you can take a mouse and irradiate it to kill the ability to produce new blood cells in the bone marrow, injecting stem cells into the bloodstream of mice. Stem cells divide and divide into all different types of white blood cells. Bone marrow transplantation is achieved simply by injecting stem cells into the bloodstream from a donor. Stem cells, almost magically, find their way into the bone marrow and make their home there. Each of the different types of white blood cells has a special role in the immune system, and many can transform themselves in different ways. The following descriptions will help you understand the roles of different cells. Eophils are the most common form of white blood cells that you have in your body. Your bone marrow produces trillions of bone marrow every day and releases it into the bloodstream, but has a short lifespan and is generally less than a day. Once in the bloodstream the emophil can travel through the capillary wall to tissues. The eophil is attracted to foreign d'ies, inflammation and bacteria. When a fragment or cut is received, the eophil is attracted by a process called thy back. Many single-celled organisms use this same process - chemical axes allow mobile cells to move toward higher concentrationsWhen an eophil finds a foreign body or bacteria, it involves it and releases enzymes, hydrogen peroxide and other chemicals from the granules to kill the bacteria. At severe sites of infection (where many bacteria have regenerated in the area), pus forms. Pus is simply a fragment of a dead eophil and other cells. Eosphates and basophils are much less common than eosophils. Eosphils seem to focus on parasites in the skin and lungs, and basophils carry histamine, so it is important to cause inflammation (along with mast cells). From the point of view of the immune system, inflammation is a good thing. It brings more blood and ditess the capillary walls so that more immune system cells can reach the site of infection. Of all blood cells, macrophages are the largest (hence the name macro). Monocytes are released by the bone marrow, float in the bloodstream, enter tissues and turn into macrophages. Most boundary organizations have their own dedicated macrophages. For example, alveoli macrophages live in the lungs, keeping the lungs clean (by ingesting foreign daffods such as smoke and dust), not including diseases (by ingesting bacteria and microorganisms). Macrophages are called Langerhans cells that live on the skin. Macrophages also swim freely. One of their jobs is to clean up dead eosuloculations - macrophages clean up pus, for example, as part of the healing process. Lymphocytes handle most of the bacterial and viral infections we get. Lymphocytes begin in the bone marrow. What is destined to become B cells develops in the bone marrow before entering the bloodstream. T cells begin in the bone marrow but travel through the bloodstream to the thymus, where they mature. T and B cells, often found in the bloodstream, tend to be concentrated in lymphatic tissues such as lymph nodes, thymus and spleen. There is also considerable lymphatic tissue in the digestive system. B cells and T cells have different functions. B cells, when stimulated, mature into plasma cells and produce antibodies. Certain B cells are adjusted to specific germ cells, and when germ is present in the body, B cells clone themselves and produce millions of antibodies designed to eliminate germ. T cells, on the other hand, actually hit the cells and kill them. T cells, known as killer T cells, can detect cells in your body that are holding the virus, and when it detects such cells, it kills it. Two other types of T cells, known as helpers and suppressor T cells, help create killer T cells and control the immune response. Helper T cells are actually very important and interesting. They are activated by interleukin-1, which is produced by macrophages. Once activated, helper T cells produce interleukin-2. These chemicals activate B cells to produce antibodies. Level of complexity and interactionThe eospasm, macrophages, T cells and B cells are really quite amazing. White blood cells are so important to the immune system that they are used as a measure of the health of the immune system. When we heard that someone had a strong immune system or a suppressed immune system, it was determined by counting different types of white blood cells in blood samples. Normal leukocyte counts range from 4,000 to 11,000 cells per microliter of blood. 1.8-2.0 helper T cells per suppressor T cell are normal. Normal absolute eophil count (ANC) ranges from 1,500 to 8,000 cells per microliter. Articles like introductions to hematology will help you learn more about white blood cells in general and the different types of white blood cells found in your body. One of the key questions to ask about white blood cells (and some other parts of the immune system) is, How do you know what white blood cells attack and what they leave alone? Why don't white blood cells attack every cell in the body? There is a system that is built into every cell in the body called. It's fair game because what the immune system finds that doesn't have these markings (or has the wrong ones) is definitely not you. Encyclopedia Britannica says of MHC: It has two main types of MHC protein molecules - Class I and II - spanning the membranes of almost every cell in an organism. In humans, these molecules are all coded by several genes gathered in the same region on chromosome 6. Each gene has an unusual number of alle allies (alternative forms of the gene). As a result, it is very rare for two individuals to have the same set of MHC molecules, which are collectively called tissue types. MHC molecules are an important component of the immune response. They allow cells invaded by infectious organisms to be detected by cells of the immune system called T lymphocytes (T cells). MHC molecules do this by presenting fragments of proteins (peptides) belonging to invaders on the surface of cells. T cells recognize foreign peptides bound to MHC molecules, bind to them, and stimulate T cells to destroy or cure infected cells. In unin infected healthy cells, MHC molecules present peptides from their own cells (self-peptides), where T cells do not normally respond. However, autoimmune diseases occur when the immune system malfunctions and T cells respond to the self-peptide. For more information, see Biology of the immune system and major histology complexes. There are a lot of diseases which cannot be caught again even if caught once. Yes is a good example as well as chicken pox. what happens inThe disease is that they make it to your body and start playing. The immune system gears up to eliminate them. There are already B cells in your body that can recognize the virus and produce antibodies for it. However, the number of these cells per antibody is negligible. When a partial disease is recognized by these few specific B cells, the B cells turn into plasma cells, clone themselves and begin to send out antibodies. This process takes time, but the disease runs it and is eventually eliminated. However, while it is eliminated, other B cells for the disease clone themselves but do not produce antibodies. This second set of B cells has remained in your body for years, so if the disease reappears, it can eliminate it just before your body can do anything to you. Vaccines are a weak disease. It is a killed form of the disease or a similar but less toxic strain. When you get inside your body, your immune system attaches the same defenses, but since the disease is different or weak, there are few or no symptoms of the disease. Now, when a real disease invades your body, your body can quickly eliminate it. Vaccines are present against all kinds of diseases, both viruses and bacteria, including measles, mumps, whooping cough, tuberculosis, smallpox, polio and typhoid fever. However, many diseases are not cured by vaccines. Colds and flu are two good examples. These diseases mutate very quickly or have so many different strains in the wild that it is impossible to inject all of them into your body. For example, every time you get the flu, you get different strains of the same disease. AIDS (gonthen immunodeficiency syndrome) is a disease caused by HIV (human immunodeficiency virus). This is a particularly dangerous disease for the immune system, as the virus actually attacks immune system cells. In particular, they are reproduced in helper T cells and terminated in the process. Without helper T cells to adjust things, the immune system eventually collapses and the victim dies of other infections that the immune system can normally handle. For more information, see how AIDS works, as well as the link below. During HIV LifecycleAIDS ResearchAIDS and HIVDrugsAIDS/HIV research and treatment, your immune system is unable to activate itself fast enough to exceed the reproductive rate of certain bacteria, or bacteria are producing toxins so fast that they cause permanent damage before the immune system eliminates the bacteria. In these cases, it would be good to help the immune system by directly killing the bacteria in question. Antibiotics are chemicals that kill bacterial cells but do not affect the cells that make up your body. For example, many antibiotics interrupt internal machinesThe cell that builds the cell wall. Human cells do not contain this machine, so they are not affected. Different antibiotics work in different parts of the bacterial machine, so each is more or less effective against certain types of bacteria. You can see that antibiotics do not affect the virus because it is not alive. One problem with antibiotics is that they lose their effectiveness over time. Taking antibiotics kills all targeted bacteria, usually over a week or 10 days. Antibiotics kill most of the target bacteria very quickly, so you feel better very quickly (in just a day or two). But sometimes one of the offspring of bacteria ends up containing mutations that can survive certain antibiotics. This bacterus then regenerates and the whole disease mutates; eventually the new strain is infecting everyone and the old antibiotics will no longer affect it. This process has become an increasing problem over time and an important concern in the medical community. Sometimes the immune system make mistakes. One type of mistake is called autoimmune: for some reason the immune system attacks its body in the same way that it usually attacks bacteria. Two common diseases are caused by mistakes in the immune system. Young-onset diabetes is caused by the immune system attacking and eliminating cells in the pancreas that produce insulin. Rheumatoid arthritis is caused by the immune system attacking tissues in the joints. Allergy is another form of error in the immune system. For some reason, in people with allergies, the immune system reacts strongly to allergens that should be ignored. Allergens can be specific foods, certain types of pollen, or the fur of certain types of animals. For example, people who are allergic to pollen suffer from runny noses, watery eyes, sneezing, etc. This reaction is mainly caused by mast cells in the nasal cavity. In response to pollen, mast cells release histamine. Histamine has the effect of causing inflammation, and liquid flows from the blood vessels. Histamine also causes itching. To eliminate these symptoms, the drug of choice is, of course, an antihistamine. The last example of immune system mistakes is the effect of the immune system on transplanted tissues. This is not really a mistake, but transplantation of organs and tissues is almost impossible. When foreign tissue is placed in your body, its cells do not contain correct identification. Therefore, your immune system attacks the tissues. The problem cannot be prevented, but it can be reduced by carefully matching tissue donors with recipients and using immunosuppressants to prevent immune system reactions. Of course, by suppressing the immune system, these drugs open the patient to opportunistic infections. For more information, seeCheck the links on the following pages in the immune system and related topics. Page.