

# Safety Systems

There are many things that cause disease. One cause is infection. Microbes are very small living things. Viruses and bacteria are microbes. Some kinds of fungi are microbes, too. Microbes can get inside your body. There, they can hurt your cells. They can steal food from your cells. You have three organ systems to stop this.

## The Immune System

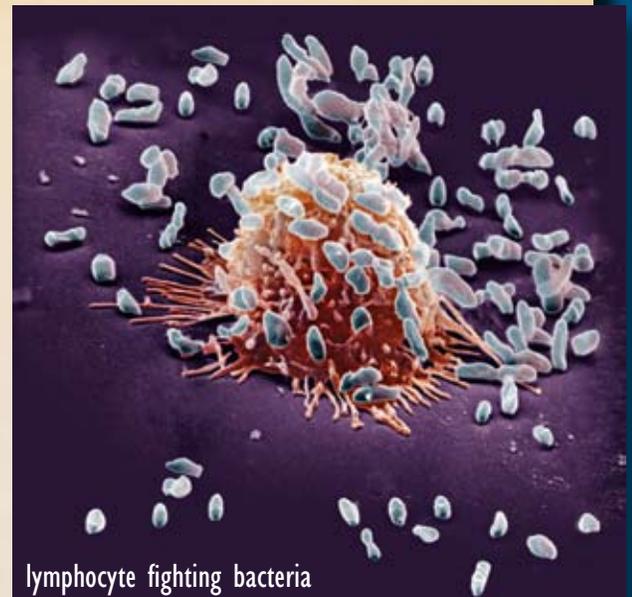
People come in contact with germs all day. Most of the time, they don't get sick. They don't have to think about it. How can we fight off microbes so easily? The body's immune system does the work.

The immune system has lymphocytes, or white blood cells. They act like soldiers. They fight off invaders. The more microbes, the more white blood cells are sent out. They find the germs. They grab them. Then they wrap around them. White blood cells actually eat the germs.

Your body also makes antibodies. These are small proteins. They float in your blood. Each one has two tips. You have lots of antibodies in your blood. That makes lots of tips in your blood. The tip can stick to invading germs. This slows them down. It can even stop them hurting your cells. Then the white blood cells find germs and eat them, too.

## The Lymphatic System

The lymphatic system includes the lymph nodes, spleen, and tonsils. Lymph nodes fight disease. They are filled with fibers. The fibers destroy germs. The nodes can also fight cancer cells. The spleen pulls germs out of the blood. Tonsils block germs in the throat.



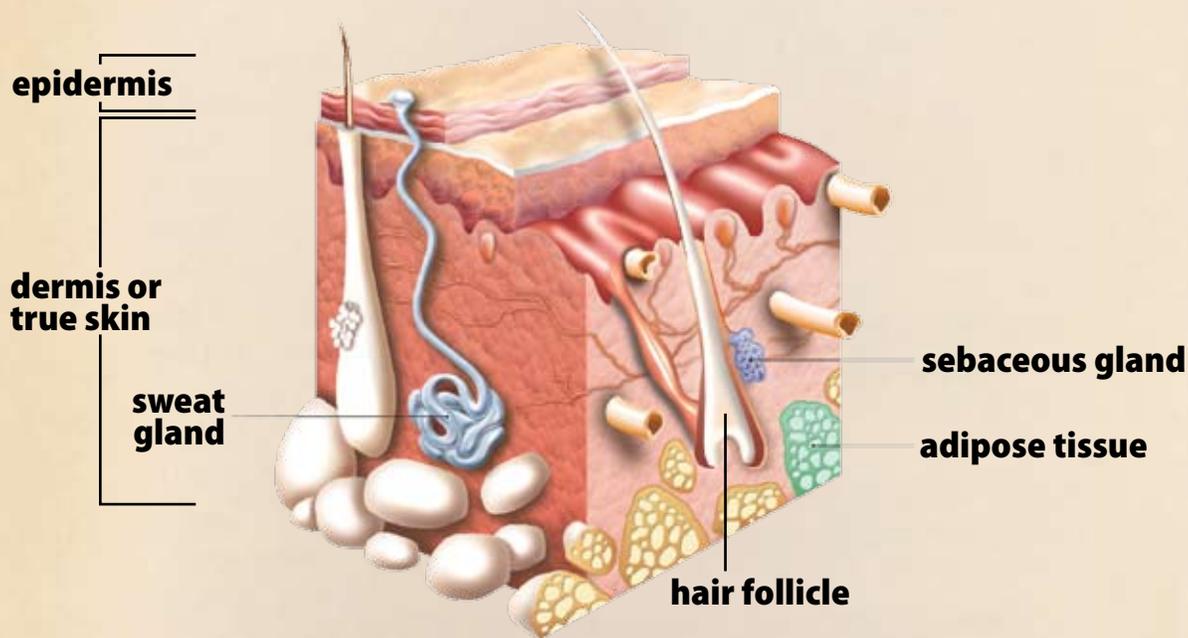
## The Integumentary System

Skin, hair, and nails are all part of one system. It is called the integumentary system. They protect the body from the world.

The skin is the body's largest organ. It does many things. The skin protects the organs in the body. It can touch. It feels pain. It also feels hot and cold. Did you know the skin also helps control the body's heat?

The skin has two layers. They are the top layer and the bottom layer. The top layer keeps the body from drying out or getting "flooded." The bottom layer holds hair roots and sweat glands.

Almost every part of your body has at least some hair. The hair helps control body heat. It also shades the head from too much sunlight. Your hair is affected by your genes. Genes play a big part in hair texture, color, and growth.



It is easy to hurt the tips of your fingers and toes. The nails on your fingers and toes are hard plates of protein. They make the fingers and toes strong. The health of a nail can be a sign of the health of the whole person.

### Comprehension Question

Name three ways your body keeps itself safe.

# Safety Systems

There are many causes for disease. One of the most common is infection. Viruses, bacteria, and some fungi are microbes. They are very tiny. They can invade the body. They destroy the body's cells. Microbes steal nutrients from the body. Your body has three organ systems to stop this.

## The Immune System

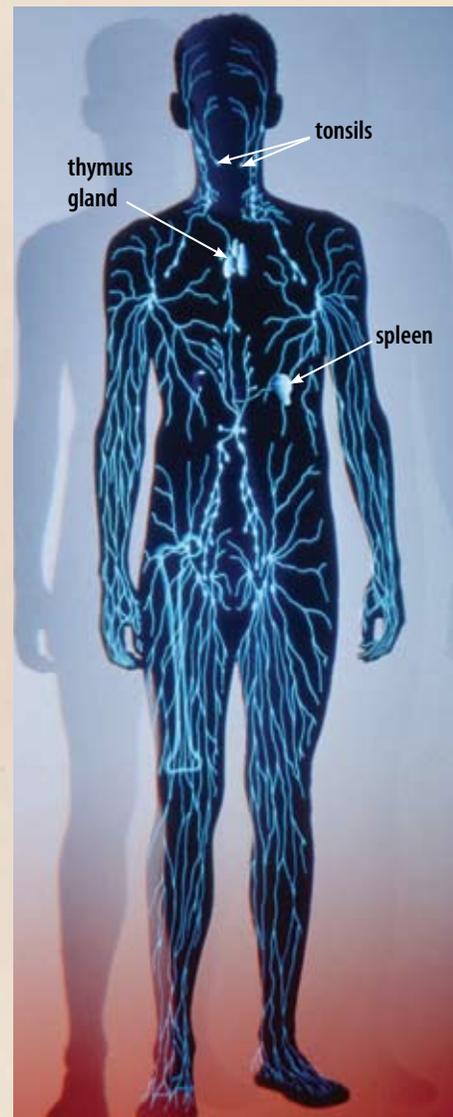
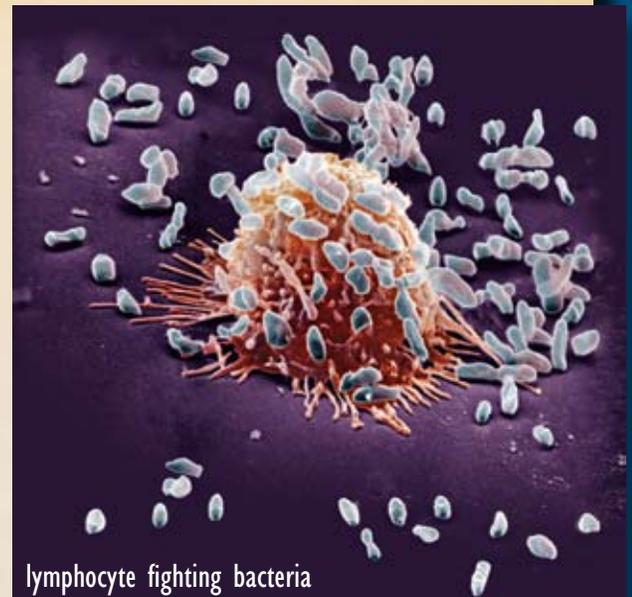
People come in contact with germs every day. Most of the time, they don't get sick. They don't have to think about it. How can we fight off dangers without even thinking about it? The body's immune system is its defense.

The immune system has lymphocytes, or white blood cells. They act like soldiers, fighting off invaders. The more microbes, the more white blood cells are sent out. They find the bacteria and viruses, grab them, and then wrap around them. White blood cells actually eat the germs.

Your body also makes antibodies. These are small proteins. They patrol through your blood. Each one has two special tips. You have millions of antibodies in your blood. They have millions of tips. The tip can stick to microbe invaders. This slows them down. It can even prevent them hurting your cells. Then the white blood cells find them and eat them, too.

## The Lymphatic System

The lymphatic system includes the lymph nodes, spleen, and tonsils. Lymph nodes fight disease. They are filled with fibers. The fibers destroy pathogens, or germs, and cancer cells. The spleen removes germs in the blood. Tonsils block germs from entering the throat.



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The tips of the fingers and toes are very sensitive. The nails are hard plates of protein. They protect and support the fingers and toes. The health of a nail can be a sign of the general health of a person.

### Comprehension Question

How do your body systems keep you safe and healthy?

# Safety Systems

There are many causes for disease. One of the most common is infection. Microbes such as viruses, bacteria, and fungi can invade the body. They destroy cells and steal nutrients from the body. Your body has three organ systems to prevent this.

## The Immune System

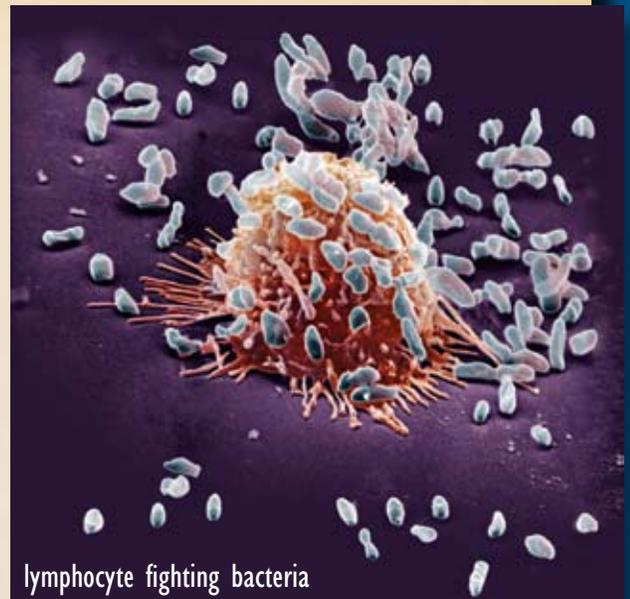
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It has lymphocytes, or white blood cells. They act like soldiers, fighting off invaders. The worse the infection, the more white blood cells are sent out. The lymphocytes find the bacteria and viruses. They grab them and then engulf them. They actually eat the bacteria and viruses.

Your body also produces antibodies. These are small proteins that patrol through your bloodstream. Each antibody has two special tips. You have millions of antibodies in your blood. They have millions of different tips. The tip can make a chemical bond with microscopic invaders. This slows them down or even prevents them from interacting with your cells. Then the lymphocytes find the invaders and eat them, too.

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lymphocyte fighting bacteria



## The Integumentary System

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The skin is the body's largest organ. It does many things. It protects the internal organs. It can detect touch. It feels pain. It also feels hot and cold temperatures. Did you know the skin also helps control body temperatures?

The skin has two layers. They are the upper layer and the lower layer. The upper layer keeps the body from drying out or becoming "flooded." The lower layer supports hair follicles and sweat glands.

Almost every part of your body is covered with hair. The hair helps control body temperature. It also protects the head from harmful sunlight. Each person's hair is affected by heredity. Genes play a big part in determining texture, color, and growth.



The tips of the fingers and toes are very sensitive. The nails are hard plates of protein. They protect and support the fingers and toes. The health of a nail can be a sign of the general health of a person.

### Comprehension Question

Describe how your immune, lymphatic, and integumentary systems work together to keep you safe and healthy.

# Safety Systems

There are many causes for disease, but one of the greatest is infection. Microscopic organisms such as viruses, bacteria, and fungi can invade the body, destroying cells and stealing nutrients from the body. Your body has three organ systems to prevent this from happening.

## The Immune System

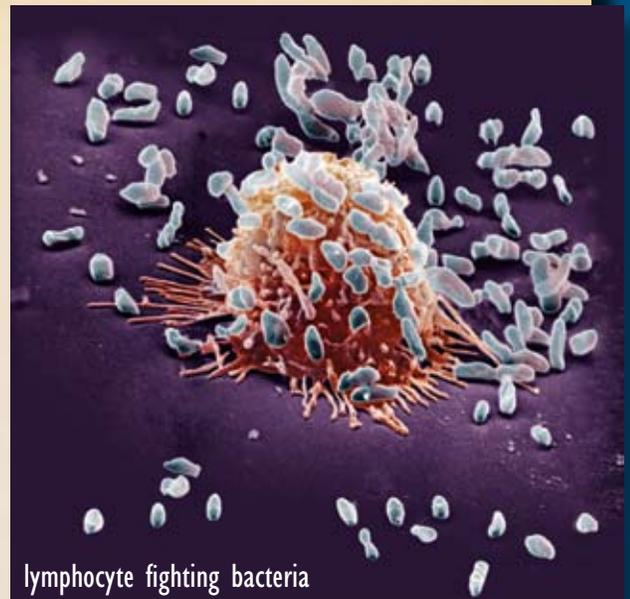
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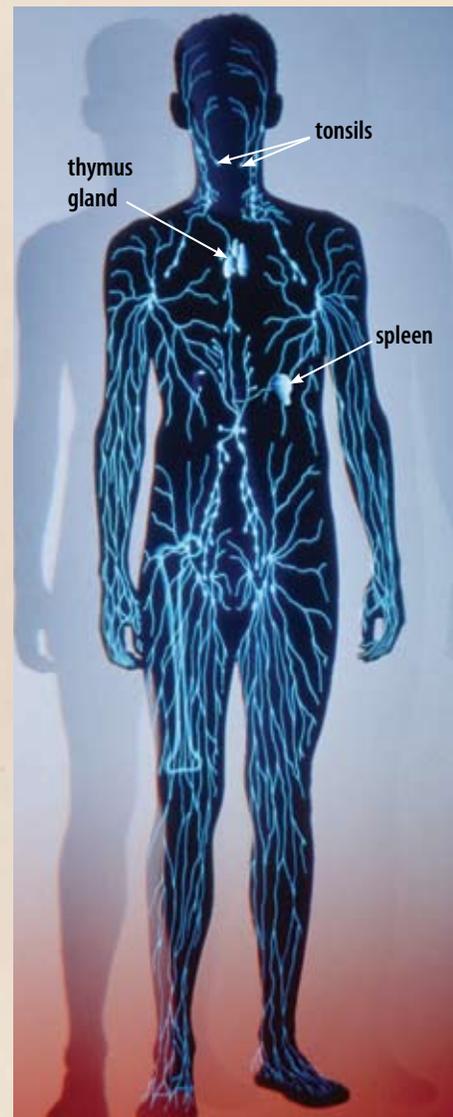
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## The Lymphatic System

The lymphatic system includes the lymph nodes, spleen, and tonsils. Lymph nodes are filled with fibers, which fight disease. They destroy pathogens, or germs, and cancer cells. Meanwhile, the spleen removes germs in the blood, and tonsils block germs from entering the throat.



lymphocyte fighting bacteria



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Skin, hair, and nails make up the integumentary system, which protects the body from the outside world.

The skin is the body's largest organ. It does many things: it protects the internal organs, it can detect touch, it feels pain, and it also feels hot and cold temperatures. The skin also helps control body temperatures.

The skin has two layers: the epidermis, or upper layer, and the dermis, or lower layer. The epidermis keeps the body from drying out or becoming "flooded." The dermis supports hair follicles and sweat glands.

Almost every part of your body is covered with hair. The hair helps control body temperature. It also protects the head from harmful sunlight. Each person's hair is affected by heredity. Genes play a big part in determining texture, color, and growth.



The tips of the fingers and toes are very sensitive. The nails are hard plates of protein which protect and support these sensitive areas. The health of a nail can be a sign of the general health of a person.

### Comprehension Question

Describe how your body's systems keep you safe and healthy.