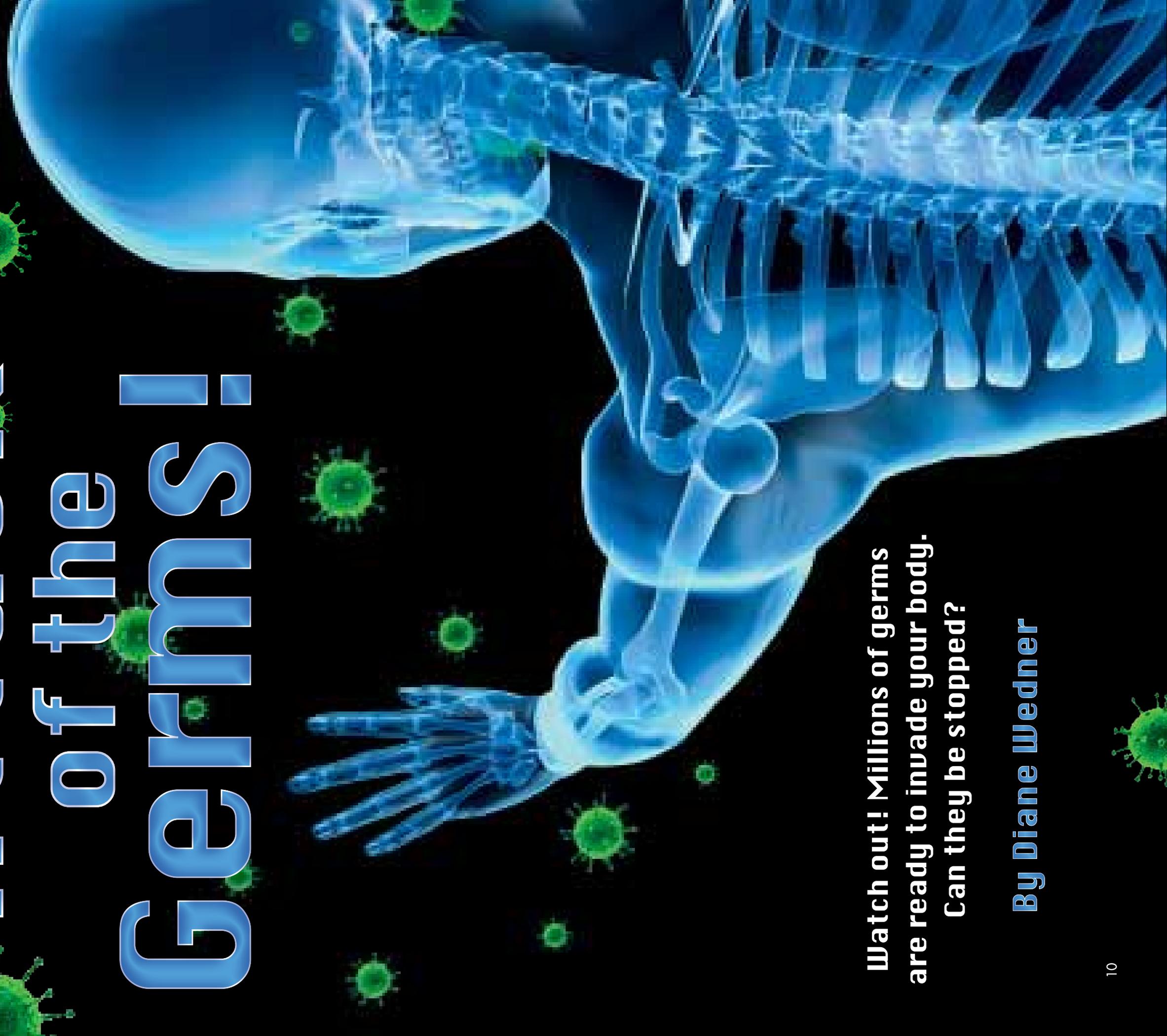


Attack of the Germs!

**Watch out! Millions of germs
are ready to invade your body.
Can they be stopped?**

By Diane Wedner



Your throat feels like it's on fire. You're sneezing, and your nose is dripping like a leaky hose. Your muscles ache, and you have a fever. Oh no! Your body is under attack.

Don't worry because your **immune system** is ready to fight back. This is your body's defense system. It protects you from millions of germs. These germs try to invade your body and make you sick. To fight back, many parts of your body work together. Let's see how this system works.

Meet the Invaders

It starts with germs. Germs are on your skin all the time. They're so small that you can see them only with a microscope. They can get into your body many ways. Sometimes, you breathe them in. Other times, they hitch a ride into your mouth on the food you eat.

Animals such as mosquitoes and ticks sometimes carry germs that they pass on to you. Sick people can pass on their germs, too. If you touch their hands and then touch your nose or mouth, you might pick up some of their germs.

Once germs find a way inside your body, they can cause trouble. Some of them multiply, making many more. They can make you sick. You might get a fever, a cold, or even a stomachache.

Unwanted Guests

There are two main types of germs. The first type is **bacteria**. Bacteria are tiny organisms made up of one **cell**. Cells are the building blocks of all living things.

In some ways, bacteria are like tiny fish in a huge sea. They swim around inside your body. They get their food from you. They eat nutrients your body makes. They also multiply very quickly. One bacterium can turn into millions in a few hours!

Some bacteria are harmful. They can cause ear infections and strep throat. Not all bacteria are bad, though. Some help you digest your food. About 700 types of good bacteria live in your intestines. They keep multiplying so there's no room for the bad bacteria to move in. They can also kill the bad bacteria.

The second main type of germs are **viruses**. A virus can cause disease, but it can't live on its own. Viruses are smaller than bacteria. The biggest virus is the size of the tiniest bacterium. Unlike bacteria, they don't swim around in your body. Viruses move into your cells.

Viruses are usually bad for the body. They can cause the flu and colds, for example. You can find viruses in many places. They stick to doorknobs, kitchen counters, and other people's hands. A virus in someone's sneeze can reach you even if you're standing a meter (3 feet) away.



A scientist studies how this type of bacteria grows in a lab.

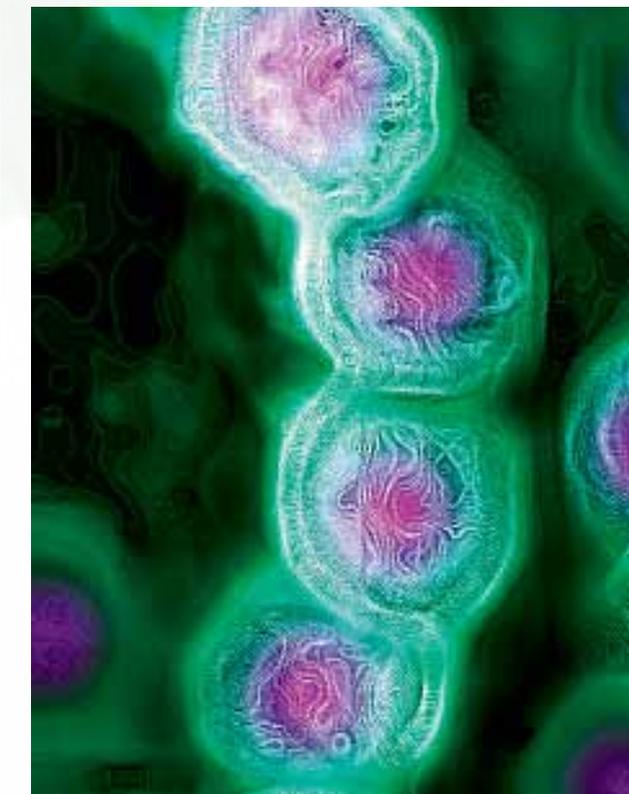


This virus is ready to attack your body.

Tuberculosis bacteria (orange) attack a blood cell (pink).



Watch out! These round bacteria can mean trouble. They can cause strep throat.



Fighting Back

Millions of germs are always around you. Yet your body's immune system has cool tools to destroy them.

It starts with your skin. Your skin is like a suit of armor. It covers your body and protects you. Your skin has special cells that warn your body that germs are ready to attack. Your skin also makes chemicals that can kill germs.

If germs do get past your skin, other parts of your immune system fight back. Say a cold virus tries to get into your body through your nose. A thin film called a mucus quickly traps it. This mucus is like a wall. It blocks the virus so it can't move.

Next, the hairs in your nose try to sweep the virus out. Viruses don't give up easily, though. They can irritate your nose. Coughing and sneezing help toss them out of your body.



Mucus (yellow) clings to nose hairs (green).

The Germ Police

Some germs are so tough, they get past your body's first defenses. Maybe they get in through a cut in your skin. When this happens, the germs go right into your bloodstream. There, they multiply so fast, your body has a hard time fighting them off.

That's when your white blood cells kick into action. White blood cells are a part of your immune system. They help fight germs. Billions of them float through your blood. They're like police officers on patrol. They're looking for bacteria and viruses.

Help Is on the Way

Your body makes several types of white blood cells. It works like this. Let's say you cut your finger. One group of white blood cells rushes to the scene to check out the damage. They find germs that have entered the cut. Then they surround the germs and gobble the germs up. This kills some germs, but those white blood cells die, too.

Two other types of white blood cells move in next. These cells are called T cells and B cells. B cells are like workers in a factory. They make **antibodies**. Antibodies stop an infection.

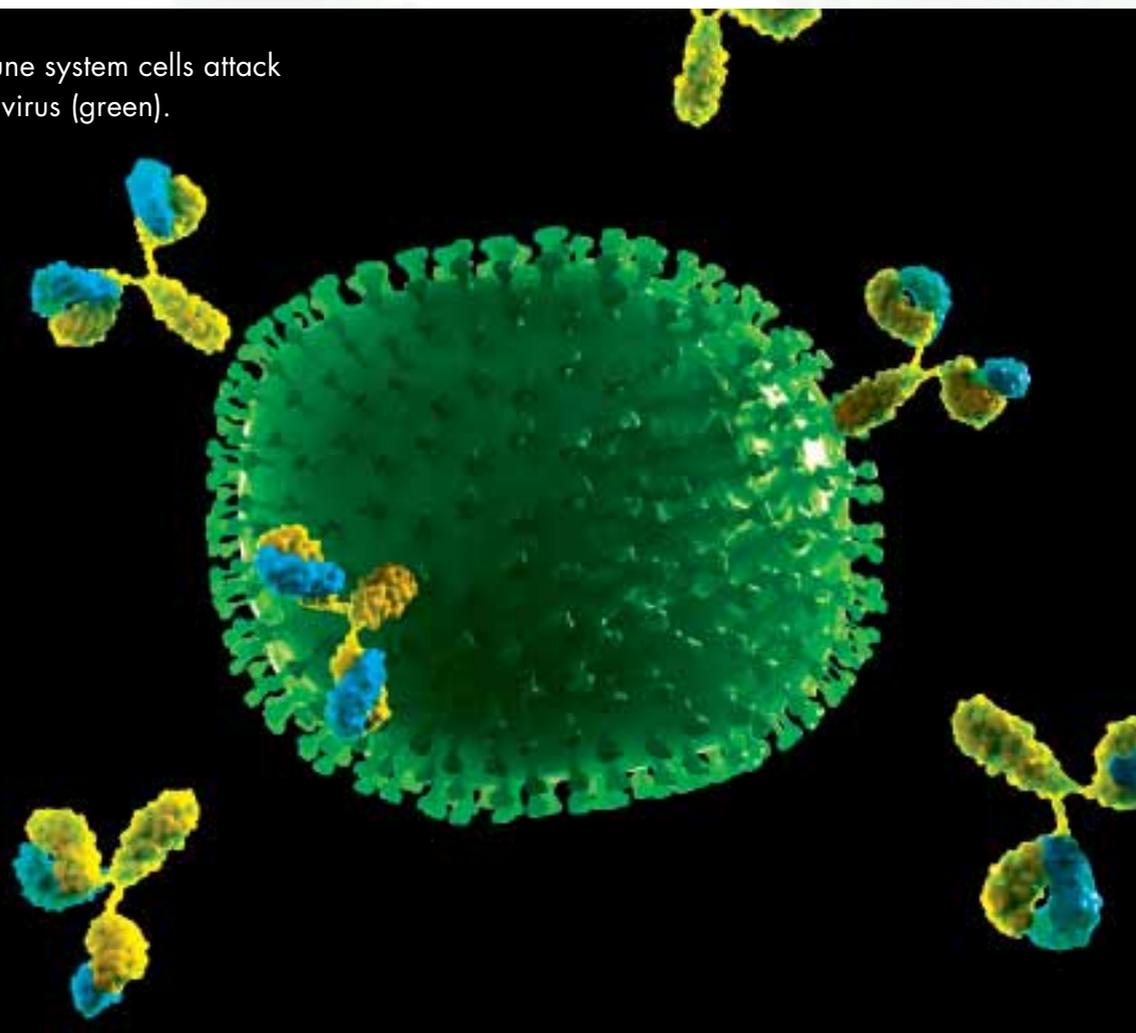
The B cells make antibodies that match specific germs. As these B cells move through your body, they look only for those types of germs. Once they find them, the B cells attack.

B cells also remember which germs help and which germs harm your body. That way, they're ready to fight back if the harmful ones come back again.

T cells have two jobs. Some T cells are like generals telling other cells what to do. Others are fighters. The generals send the fighters to kill cells that have the germs inside.

Fun Fact: About 50 billion white blood cells fight diseases in your blood.

Immune system cells attack a flu virus (green).



Staying Healthy

Your immune system is at work all the time. You know it's working well if you get better after you're sick. It's also working if a cut heals. If you don't get the same illness over and over, your immune system is doing its job.

You can help your immune system keep you healthy by taking care of yourself. Be sure to wash your hands often so you don't catch germs from others. Wash them after playing sports and before eating meals.

Eat healthy foods, such as fruits, vegetables, and meats. That will help your body fight off germs. Get lots of exercise. Being physically active can help your body build antibodies.

Be sure to get good rest at night, too. Not getting enough sleep can actually weaken your immune system. By taking care of your body, you'll feel better and you'll help your busy immune system.

WORDWISE

antibody: a protein used by the immune system to fight infection

bacteria: microscopic organisms made up of one cell

cell: the smallest and most basic part of a living thing

immune system: the body system that protects you against disease and infection

virus: a type of tiny germ that can cause disease