

An Expedition with the American Museum of Natural History



# EPIDEMIC! ON THE TRAIL OF KILLER DISEASES

Title of Web page

## TB THE DISEASE THAT WON'T GO AWAY

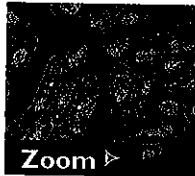
*The struggle between critters that cause disease and humans is a long one, and it's unlikely to end any time soon.*

### An Ancient Enemy Gets Tougher

Karen Watson

Title and author of article

It's easy to think of David and Goliath when faced with the size of the creature that kills more people through disease than any other in the world. It's so small that it's invisible to the eye. Even viewed under a souped-up microscope it doesn't look like much—a tiny, capsule-like thing that could be a sprinkle on a frosted cake.



Yet the microorganism that causes tuberculosis has felled millions through a terrible wasting of the body—it takes just one bacterium to start what ultimately could become a fatal infection. For thousands of years, this invisible David has been knocking down human Goliaths in shocking numbers.

Stone Age skeletons unearthed in Britain and Germany show tell-tale TB damage. Egyptian tomb portraits include images of hunchbacks curled by spinal TB. Scribes from ancient Hindu, Babylonian, Assyrian, Chinese, Greek, and Roman cultures all describe the signs and symptoms of what in more modern times came to be called "consumption."

#### Follow TB's trail through time.

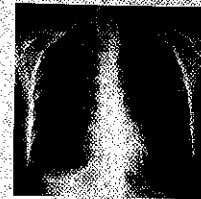
[RealVideo 28.8](#) ([RealPlayer](#) required) | [RealVideo 56.6](#) | [Quicktime](#)

In 1908, when the [American Museum of Natural History](#) in New York opened its international exhibition on TB, people stood in lines that wrapped around the block to find out more about the disease that devastated families. Nearly 100 years later, as the museum launches a major new exhibition, "Epidemic! The World of Infectious Disease," TB remains a killer. These days, 2 to 3 million people a year die from tuberculosis worldwide, according to the World Health Organization. Someone somewhere is infected every second.

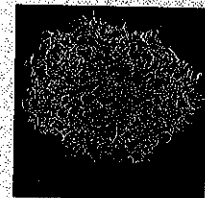
Is the little guy that packs a TB wallop out to get us? Do any of the microscopic critters that cause infectious diseases—the oddball zoo of viruses, bacteria, and protozoa—really want to see us dead?

The Table of Contents identifies other diseases covered on this Web site.

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[Ask the Experts](#)

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Click on one of these **internal links** on the side to go to a related page on this Web site.

Click on multi-media link for audio or visual features.

Internal links (in red) in the text take you to related pages on the Web.



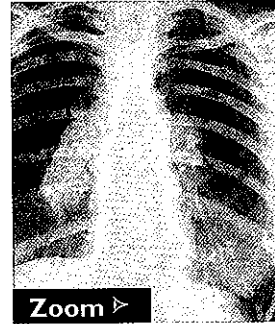
Small text at the top of the page, likely a copyright notice or technical information.



Location: <http://www.discovery.com/exp/epidemic/tb/tb.html>

No, say scientists. These inhabitants of a vast microworld are just out to make a living. It just so happens that the living is on us.

Take the TB "bug." It likes us for some reason, along with a startling collection of other animals. Lions, tigers, sheep, cows, guinea pigs, dogs, and cats are a few. Name it, and it likely gets the disease. Why? For some reason, the TB bacterium actually prefers life inside one of the body's defenders. It makes a living from an immune system cell that normally munches up such invaders.



Click on zoom enlargement of and more info

**Ask the experts about TB and our struggles with it.**

Breathe in an airborne TB bacterium and it typically lands in the lungs. There, immune system cells quickly surround it and wall it off, forming a firm white ball the size of a pinhead. Inside this ball, the bug persists, perhaps for years. Exactly what happens there remains unclear, and most people with the TB bug inside them never experience the disease or become infectious themselves. Their body successfully keeps the invader in check.

But if there's a glitch in the body's defense system, and it doesn't work quite right, these once tiny balls can grow, some to the size of a baseball, as the bacteria inside them reproduce. These balls can erupt, spreading bacteria to other parts of the body through the blood. More balls, or "tubercles," grow, eventually clogging up the way the body does its daily business.

Every time someone sick with TB sneezes or coughs or exhales, they help the bacterium out. "Spreading is survival for the bug," says Dr. Ann Ginsberg, a TB scientist with the National Institute of Allergy and Infectious Diseases.



**Hear about how tough TB is to tackle.**

(RealPlayer required)

So why haven't we figured out a way to knock TB off the planet? The bug that scientists now call *Mycobacterium tuberculosis*, which long ago made a successful jump from living in dirt to living off animals, has turned out to be quite a survivor.

It hides well in humans—nearly 2 billion people are thought to carry the bacterium these days, though they show no signs. When symptoms do pop

up, they are easily confused with those of other illnesses. The bug lives off lots of other animals besides humans, and it has so far proved to be a tricky adversary when it comes to the creation of an effective vaccine, says Dr. Rick O'Brien, chief of research and development of TB elimination at the Centers for Disease Control and Prevention.

In cities worldwide, though mostly in Africa and East Asia where the disease is most prevalent, TB now has a new ally of sorts in the virus that causes AIDS. It weakens the immune system, giving TB a kick-start.



Zoom

This has doctors and researchers worried, since it creates a double-disease whammy in places where people were just getting a handle on TB. Moreover, those who have the disease must take a special combination of antibiotics for at least six months. If they don't complete their treatment, they risk nurturing new strains of drug-resistant TB.

The deceptively tiny David carries a big bag of survival tricks.

**For more about TB:**

[Centers for Disease Control and Prevention](#)

[World Health Organization](#)

[National Tuberculosis Center, NJ](#)

[National Tuberculosis Center, NY](#)

[National Tuberculosis Center, CA](#)

[National Institute of Allergy and Infectious Diseases](#)

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ore information.

Got a question about TB? [Ask the experts.](#)

Find out what happens when a microbe invades your body: [Fight the Invaders.](#)

[Turn to Disease Alert!](#) for the latest on outbreaks.

**EPIDEMIC!**

[TB](#)   [Flu](#)   [Polio](#)   [Dengue](#)   [Hanta](#)   [At the Museum](#)  
[Disease Alert](#)   [Tune In](#)

**EXPEDITIONS**

Click on these external links to leave the Web site and go to other Web sites with related information. Phrases such as "For more about..." and "Other sources" often identify these links.

## Reading Check

1. What evidence do scientists have that tuberculosis is an ancient disease?
2. How widespread is tuberculosis today?
3. What happens when a tuberculosis bacterium enters a human body?

## Test Practice

1. If you wanted to research why TB is still deadly, which of the following questions would be *most* relevant?
  - A What have Stone Age skeletons revealed about TB?
  - B How many species of animals can contract TB?
  - C Why is TB currently most common in Africa and East Asia?
  - D How does the human immune system function?
2. If you were using a **search engine** to learn about treating TB in domestic cats, which **search term** would probably yield the *best* results?
  - F Tuberculosis
  - G Tuberculosis in cats
  - H Pet care
  - J Preventing tuberculosis
3. Which **link** would you use to ask questions about TB?
  - A Disease Alert!
  - B Ask the Experts
  - C Fight the Invaders
  - D Hidden Enemies
4. Which source would provide the *most* reliable information about the latest methods of treating TB?
  - F An interview with an emergency-room doctor
  - G The online National Library of Medicine of the U.S. National Institutes of Health
  - H A research paper by a high school senior
  - J An article on tuberculosis in an encyclopedia for young readers
5. Which source would have the *most* recent statistics on TB worldwide?
  - A The statistics department of the World Health Organization
  - B A women's health magazine
  - C A book on TB written in 1998
  - D An encyclopedia article on TB
6. To find out about viruses, which **link** would be *most* helpful?
  - F Tales of a Survivor
  - G Views from Space
  - H National Tuberculosis Center, CA
  - J Go Inside a Virus

## SKILLS FOCUS

## Reading Skills

Understand how to use research resources, including print resources and the Internet.

## Constructed Response

Imagine that you are writing an article on TB or another disease. Write **questions** that focus on one aspect of your topic, and look for answers on the Internet or in a library. Keep a list of the sources you explore, and rate their usefulness.