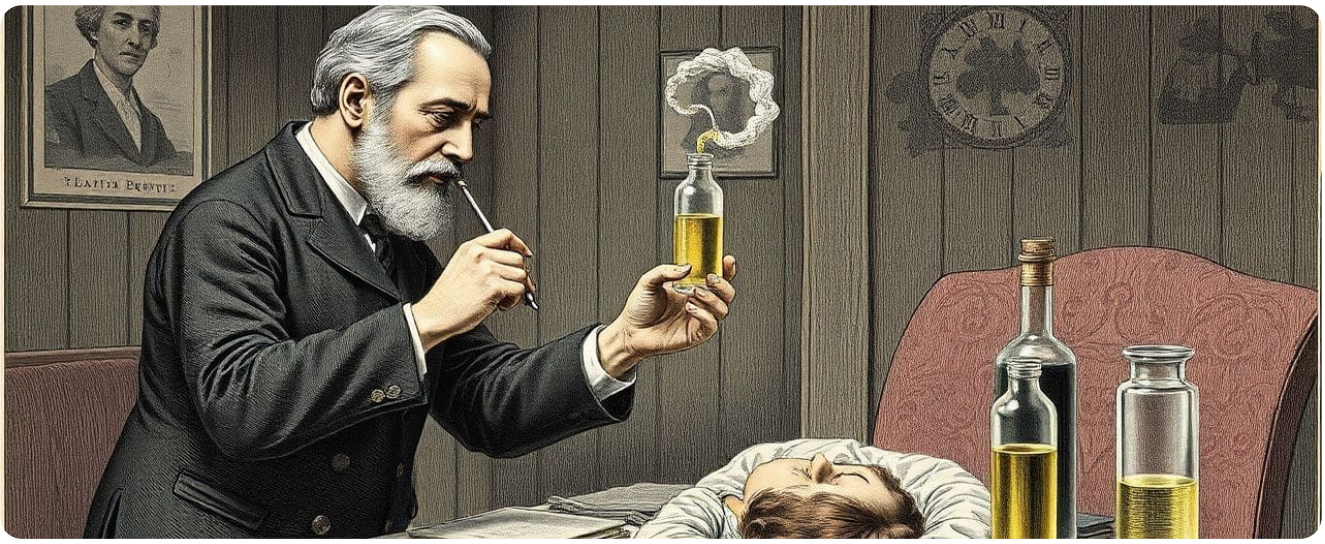
Emil von Behring: The Serum That Saved a Generation (1901)

March 2, 2026



Imagine Berlin at the end of the 19th century. Winter is harsh, but the true chill doesn't come from the weather; it comes from the fear haunting the streets. In children's hospitals, the air is heavy, filled with a sound that strikes terror into any parent: a hoarse, desperate wheezing. They call it 'the strangling angel.' Its medical name is diphtheria, a disease that turns children's throats into a battlefield, slowly suffocating them before the helpless eyes of doctors.

In the midst of this tragedy appears a man with an intense gaze and a difficult character: Emil von Behring. He is not your typical fairytale hero; he is an obsessive military physician, prone to melancholy and deeply frustrated by the medicine of his time's inability to stop death. While his colleagues merely watched as children's lungs failed, Behring decided to find the enemy's secret weapon. At that time, it was known that bacteria caused diseases, but no one understood how such a small microorganism could kill a human so quickly. It was as if the invader released a poisonous gas inside the body.

Behring, working in the laboratory of the legendary Robert Koch, embarked on a mission that seemed impossible: to find a natural 'antidote.' He wasn't looking for a plant or a mineral, but something the body itself generated to defend itself. His laboratory was filled with guinea pigs and rabbits, and his nights were endless, surrounded by test tubes and the pressure of watching infant mortality statistics climb relentlessly. The question that kept him awake was simple yet revolutionary: if an animal survives the disease, does something remain in its blood that can protect others?

- Diphtheria killed nearly half of infected children before 1890.
- Treatments at the time were brutal and ineffective, including cauterizing throat membranes.
- Behring believed the solution was not to attack the bacteria directly, but to neutralize its poison.

What Behring discovered in the blood of his laboratory animals would change human history forever. He didn't just find a cure; he invented a totally new way of understanding immunity. But how did he manage to turn a horse's vital fluid into a life insurance policy for thousands of children? And what price did a man so tortured by his own genius have to pay to become the first winner of the Nobel Prize in Medicine?

The Logic of Poison: Beyond Microbes

To understand Behring's triumph, we must understand the problem he faced. In the 1880s, the germ theory of Pasteur and Koch was in full swing. They knew that invisible 'bugs' caused diseases. However, something strange happened with diphtheria. Doctors found the bacteria only in the throat, but the patient died because their heart and kidneys failed. How was this possible? To use an analogy, it was as if a small group of saboteurs stayed at a country's border but somehow managed to turn off the lights in every city in the interior.

Behring, along with his Japanese colleague Shibasaburo Kitasato, suspected that the bacteria produced a 'toxin.' Imagine the bacteria is a grenade manufacturer; the bacteria stays in one place but throws its grenades (the toxins) throughout the bloodstream. If you wanted to save the patient, it wasn't enough to kill the manufacturer; you had to deactivate the grenades before they exploded in vital organs.

The Birth of the 'Antitoxin'

Behring began experimenting with guinea pigs. He injected them with small doses of diphtheria bacteria, so weakened that they didn't kill the animal. Then, he discovered something amazing: if those animals survived, they became invincible against massive doses of the same bacteria. But the true 'Eureka' moment came when Behring took the blood from an animal that was already immune and injected it into a sick one. The sick animal was cured!

This is where the scientific concept we now know as antibodies comes in, although Behring called it 'antitoxin.' To explain it simply: the blood of the recovered animal contained an army of specialized 'guards.' These guards had the exact shape needed to catch and neutralize the diphtheria toxins. It was like having a master key that only opened (and blocked) a specific lock. By transferring serum (the liquid

part of the blood) from one animal to another, Behring was transferring immediate protection. He had invented serum therapy.

From the Lab to the Stables

The discovery worked in guinea pigs, but humans are much larger. To save children, Behring needed gallons of that magic serum. Guinea pigs weren't enough. So Behring took an industrial leap and moved his experiment to horses. Horses are magnificent blood factories. Behring injected horses with controlled doses of toxin, and the noble animals produced massive amounts of antitoxin in their blood without getting seriously ill. Once processed, that horse blood became the serum that could be injected into humans.

However, the path was not easy. Behring was a perfectionist and volatile man. He fought with his superiors, suffered from deep depressions, and was obsessed with other scientists, like the Frenchman Émile Roux, stealing his credit. Roux, in fact, was the one who perfected the large-scale production technique, but it was Behring who took the first conceptual step.

The Christmas Miracle of 1891

The litmus test occurred on Christmas 1891 in a Berlin hospital. A little girl was dying of diphtheria. Her breathing was the typical death wheeze. Behring, his nerves on edge, injected her with the experimental serum derived from sheep. He didn't know if it would work or if it might even kill her through an allergic reaction. For hours, the doctors waited. And then, the miracle happened: the fever dropped, the grayish membrane blocking her throat began to detach, and the girl breathed normally again. It was the first human life saved by the science of antibodies.

Glory and the First Nobel

In 1901, when the first Nobel Prize in Physiology or Medicine in history was awarded, there was no doubt. Emil von Behring was the one chosen. He was recognized for opening a new path in medical science and for placing a victorious weapon against disease and death in the doctor's hands. His work not only saved the generation of that time but also laid the foundations of modern immunology. Every time we receive a vaccine or an antibody treatment today, we are using the technology that Behring dreamed of in his laboratory full of guinea pigs.

A Human and Complex Hero

Despite his success, Behring did not find peace. He spent much of his adult life in and out of sanatoriums due to his mental health. He became immensely wealthy thanks to his patents, founding the company

we know today as CSL Behring, but he always felt misunderstood. His story reminds us that humanity's great breakthroughs often come from deeply imperfect people, whose obsession is both their greatest burden and their greatest gift to the world.

Emil von Behring taught us that our own body (or that of other living beings) has the capacity to manufacture the most perfect medicine in existence. His 'serum' was the precursor to modern vaccines that have now almost completely eradicated diseases that were once death sentences. Next time you think of medicine as something cold and technological, remember the whistling of the children in Berlin and the doctor who decided that the 'strangling angel' would not win the battle.