



# ANTIBODIES

**The European Commission published an official report from the Joint Research Centre in 2020 recommending that animals should no longer be used for the development and production of antibodies for research. Scientifically superior methods of producing antibodies that do not use animals have been available for many years.**

## What is an antibody?

An antibody is a protein produced by the body's immune system when it detects harmful substances called antigens. Antigens include viruses, chemicals, toxins, bacteria, allergens, fungi and parasites. Each type of antibody is unique and defends the body against one specific type of antigen. Immunoglobulin G (IgG) is the most common antibody. It is found in blood and other body fluids and protects against bacterial and viral infections in a range of species, including humans.

## Are antibodies vital for medical research?

Yes, antibodies are crucial tools for research, helping to develop and improve methods for diagnosing disease, therapies and regulating industry. They are used in every medical research laboratory.

## How are animals used in the development of antibodies?

A range of animals are used to produce animal-derived antibodies. These include rabbits, mice, rats, hamsters, guinea pigs, ferrets, dogs, felines, goats, camelids, sheep, pigs, non-human primates and others.

## How are the antibodies produced?

The animals are injected with substances that stimulate their immune systems to produce the desired antibodies. The animals often suffer from harmful side effects before they are eventually killed months later to harvest the antibodies.

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## How many animals are used?

It is estimated that around one million animals are used in the production of antibodies in the EU each year.

## What are the main types of animal-free antibody technologies?

Non-animal derived antibodies are produced from synthetic or naïve (non-immunised) antibody resources, which do not require animal immunisation at any stage. DNA technology and computer- led approaches can predict antibody/antigen structures, engineering the function of antibodies and design antibody-antigen complexes with improved properties.

## Which companies supply animal-free antibodies?

Bio-Rad, one of the global leading companies, have generated thousands of non-animal derived antibodies for their customers and for their own research antibody catalogue and diagnostic products, which can also be used in such areas as COVID-19 and SARS-CoV-2. Their libraries hold up to 45 billion fully human synthetic antibodies. Bio-Rad also supply laboratory kits for science education in schools.

## What are the advantages of animal-free antibodies Vs animal derived antibodies?

Unlike animal-derived antibodies, non-animal-derived antibodies are highly reproducible, as the DNA sequence is well-defined and can be exactly replicated. They can deliver more reliable binding (antibody-antigen) than animal-derived anti-bodies and can be easily produced in large volume over a shorter time period, leading to improved scientific outcomes. It is estimated that \$800 million is wasted annually worldwide on unreliable antibodies.