

Window on the Science

The role of proteins in disease

From the common cold to kidney disease, our bodies produce different proteins when we are sick.

Why study proteins?

Proteins are made up of hundreds or thousands of building blocks called amino acids, strung together in long chains. They do most of the work in cells and are required for the structure, function and regulation of our tissues and organs.

Proteins are produced by the body from 'instructions' encoded in our DNA. But unlike our genes, the type and amount of proteins we produce changes over the course of our lives. Proteins tell us what is happening in our bodies right now. This offers a whole new level of diagnosis and treatment for disease.

Infectious diseases



Microscope image of E. coli bacteria.

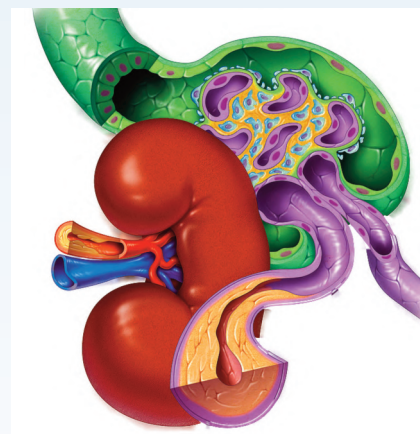
Some diseases involve an infection by microorganisms like bacteria or viruses. The invading pathogen causes the immune system to go into overdrive.

The body produces antibodies, a type of protein that binds to microorganisms to help fight them. These antibodies are specific to the infection, and are stored so that if we get sick again our body has the right protein tools to protect itself.

Non-infectious diseases

Other diseases, such as diabetic kidney disease and endometriosis, are influenced by both our genes and lifestyle. In these non-infectious diseases, the way proteins behave can tell us a lot about what is happening in the body.

In some cases, someone developing a serious disease will be asymptomatic, with physical symptoms presenting only too late. By looking at specific proteins expressed by an individual, diseases can be predicted and treated before serious damage occurs.



The kidney (left). In diabetic kidney disease the glomerulus (purple) is damaged, often without evident symptoms.