

STRUCTURAL BIOLOGY 101

What is structural biology? And how does it help us improve human health?

Let's start at the beginning.

The human body is an immensely complex system composed of trillions of chemical compounds called molecules, each of which has a specific job. When these jobs aren't carried out correctly, diseases can occur.

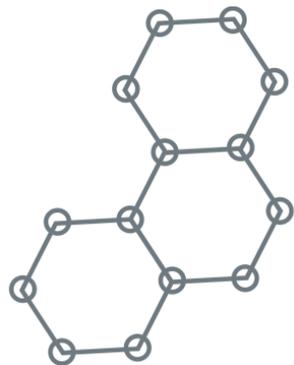


Medications treat diseases by interacting with these molecules.

For example, certain molecules in a cancer drug may interact with a specific protein involved in cellular growth to help stop tumors from replicating.

When we talk about drug targets, what do we mean?

For a drug to treat a disease, it must change something in the human body. A drug target is anything that has its current function altered by the drug, meaning that certain chemicals in the drug interact with molecules in the body that are contributing to the problem.



How do we know which drugs will work in different diseases?

That's where science comes in. One avenue researchers use to find new drug targets and to design drugs is called structural biology, which focuses on the architecture of living things and their most miniscule components, such as cells, proteins, and genetic materials like DNA.

Structure dictates function, meaning that a molecule's shape has a big impact on what it does and how well it works.

Structural biologists use advanced techniques, such as incredibly powerful microscopes, to figure out what these molecules look like and then use that information to answer important questions about how the human body works and guide development of new medications.

Think of them like high-tech locksmiths.

If you know what the lock looks like and how the pins inside are arranged, you can cut a key to fit. It's the same with structural biologists. If they know what a certain protein looks like, that insight can be used to develop medications that specifically target that protein and treat the disease more effectively.



As the old adage goes, "the more you know."

To fix a problem, we need to know what is happening behind the scenes. Structural biology is a critical tool to help us do this, and sheds light on how the human body works on the most basic level.