

## What is an Oligo?

Integrated DNA Technologies (IDT) manufactures custom products made up of short strands of DNA called oligonucleotides. In order to better understand how these are useful, it is important to know a bit about DNA itself.

DNA is “the blueprint for life” and encodes instructions for all of life’s processes. DNA is a complex, long, thin molecule made up of two strands that bind together. Each of the strands is made from nucleotides that have four possible building blocks called bases. These bases are called adenine, cytosine, guanine, and thymine, and the precise order of these bases is a code for information. In living organisms, DNA strands can be millions of bases long and therefore contain huge amounts of information. This complexity is responsible for the vast complexity and diversity of life on earth.

The way that one strand of DNA specifically binds a second strand of DNA allows scientists to use short DNA strands called oligonucleotides (often abbreviated to oligos) as research tools. A short synthetic piece of DNA (usually around 20 bases long) can be used to bind or find its matching sequence even in a complex mixture of millions of unrelated pieces of DNA. It is this unique fact that allows researchers to decode and study the genetic makeup of any living organism.

Scientists often start the research knowing the DNA sequence for the organism that they are interested in studying. Given a known DNA sequence, they can easily design a short oligo that can be used to perform a variety of tasks. It is this short single-stranded DNA that the researcher orders from IDT. Living systems don’t discriminate DNA that is synthesized chemically from DNA taken directly from an organism; this allows researchers to use IDT’s custom made oligonucleotides as if they had existed naturally. Using these oligo-based technologies, researchers are in the process of cataloging the complete genetic makeup of hundreds of living things, ranging from bacteria to humans.

IDT manufactures the oligo using chemical DNA synthesis machines designed and built in-house. IDT has refined the process to the point where an order can be manufactured and delivered to the researcher the next day. Customers range from small university labs of only a few scientists to global pharmaceutical companies. Some common uses for oligos include:

- Diagnostic tests for genetic diseases, like breast cancer or cystic fibrosis.
- Diagnostic tests for infectious diseases, like Hepatitis or AIDS.
- Research to discover new drugs or treatments for a variety of diseases.
- Producing safe and more plentiful agricultural products.

IDT is the industry leader in the competitive field of custom oligonucleotides. The company reached this position by maintaining the highest standards of quality, service, and technical expertise.