

# PCR

**Polymerase Chain Reaction, or PCR,** is a simple yet essential way to make copies of a small amount of DNA by exploiting DNA's natural ability to replicate itself when a cell divides.

The first step is to extract a small amount of DNA from a sample taken from an individual or piece of evidence. The DNA is mixed with a chemical cocktail including natural enzymes, synthetic chemicals called primers, and the four nucleotides (adenine, thymine, cytosine and guanine). After filling tiny plastic tubes with the mixture, a technician places them in a microwave-sized

machine that heats and cools the tubes to a series of precise temperatures.

The changing temperatures ignite a chain of events, beginning with the denaturing (unzipping) of the double-stranded DNA molecules. Next, the primers bind to the individual strands at precise locations, a process known as annealing. Ushered in place by the primers, enzymes steer the copying of long stretches of code. This sequence is repeated billions of times in just a few hours, supplying ample DNA for investigation.

