

How Peptides are Manufactured (Part 3)

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How are They Created by Nature

In order to be organized into peptides and proteins, cells must arrange amino acids based on a template. Once the amino acids are organized into an appropriate structure, they are released from the template and moved to other locations within or outside the cell.

Needless to say, the process that converts amino acids into functional peptides is as fascinating as it is complicated. If you keep a few basic steps in mind, it will be much easier to remember and understand how they fit into the overall structure of cell function and the capacity to carry out basic life needs.

Cellular Machinery

There are two basic organelles required to make peptides. First, the endoplasmic reticulum (ER) is a ribbon like organelle that runs throughout the cell. It acts as an anchor point as well as transmission channel for completed proteins and peptides. Depending on the phase any given cell is in, the ER may be involved in producing proteins and peptides or some other molecule.

Ribosomes (small granular organelles) attach to the endoplasmic reticulum and assemble peptides based on a template that feed through them. At this stage, the ER is often referred to as “rough” since ribosomes can be seen attached to it under a microscope. Typically, ribosomes will not bond to the ER unless the ribosomes are already bound to a template. Interestingly enough, the start and stop sequences on any given template are composed of peptides that facilitate bonding or breaking away from the ER.

The Template

If you have done any research on protein, genetic material, and peptide synthesis, then you may already realize that a special set of nucleic acids are used to form templates. For example, if the origin template utilizes RNA, the four nucleic acids involved are adenine, cytosine, guanine, and uracil. If the cell uses DNA for its genetic material, uracil is exchanged for thymine.

No matter whether the cell makes use of RNA or DNA, ribosomes cannot simply attach to the chromosome and begin transcribing proteins. Instead, special peptides and other molecules attach to the genetic material and create copies, or transcriptions of the required template pieces. Typically, this process will start at a specific code within the nucleic acid, and then end at a different point. Even though messenger RNA and transfer RNA are still formed from nucleic acids, they are able to bond with, and act as the template for arranging amino acids within ribosomes.

Why Manufacture Synthetic Peptides

There is no question that there are billions of molecules of peptides available in nature. On the other hand, gaining access to pure quantities of them can be very difficult. This is just one of many reasons why researchers are increasingly relying on ways to manufacture synthetic peptides. While discovering brand new ones still requires the usage of organic, living cells, producing them in useful quantities tends to make it easier to go past that point.

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