

Polypeptide Encyclopedia Article

Polypeptide

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Polypeptide

A polypeptide is a chain of amino acids joined together by amide linkages called peptide bonds. They are intermediate in length between oligopeptides containing several amino acids and proteins with more than fifty. The peptide bond ($-\text{CO}-\text{NH}-$) forms between the amino group ($-\text{NH}_2$) of one amino acid and the carboxyl group ($-\text{COOH}$) of the adjoining amino acid. As with other peptides and proteins, the properties of polypeptides depend on the kinds of amino acids they contain, and the order in which they are linked.

Certain polypeptides have important roles as hormones. One example, ACTH (adrenocorticotrophic hormone) is formed in the pituitary gland and regulates the activity of the adrenal cortex. Gastrin, secreted into the bloodstream of mammals by the wall of the pyloric end of the stomach, stimulates secretion of gastric juices when food enters the stomach. Secretin, a polypeptide containing 27 amino acids, is found in the lining of the upper intestine, and encourages the flow of pancreatic juices into the duodenum when hydrochloric acid from the stomach arrives there. The pancreatic emissions serve to neutralize the stomach acid thus avoiding potential damage to the intestinal lining.

Some polypeptides have antibiotic properties. One type called polymyxin, synthesized by species of the soil bacterium *Bacillus*, is active against common gram-negative bacteria such as *Escherichia coli* and *Pseudomonas aeruginosa*. It functions by disrupting the cell membranes of sensitive bacteria.