What are Enzymes?

Enzymes are proteins that drive many important biochemical reactions in living cells, this means, they "catalyze" the reactions. Without enzymes, these biochemical reactions would proceed only very slowly or not at all, so enzymes are vital to all living cells, including the human body.

Enzymes convert substances into other products and cleave large molecules into smaller ones, thus playing a central role in the metabolism. In addition to digestion, growth and respiration, they are needed for the transmission of signals and many other processes in our body.

Figure 1 shows the mechanism of enzymes that cleave large molecules (substrates) into smaller substances, as in the case of digestion. Digestive enzymes cleave fats, carbohydrates and proteins that are absorbed through the diet into the corresponding fatty acids, sugars and amino acids. The binding and conversion of the substrate to the enzyme takes place in the so-called active center, a special spatial pocket, which comes about by folding of the protein.

Enzymes are Biocatalysts

Enzymes in everyday life

Enzymes are used in many of our daily products, for example, in detergents. There, enzymes cleave the protein compounds, such as egg, milk or blood spots, split starchy stains or solve greasy soiling such as lipstick. However, enzymes are also found in toothpaste, shampoos and many foods. They are involved in the manufacture and processing of numerous products, such as paper, textiles, leather and now also in the production of biofuels. Figure 2 shows an overview of the use of enzymes in different areas of life.