

Adipose Tissue Encyclopedia Article

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Adipose Tissue

Adipose **tissue** is a specialized type of connective tissue, the tissue that binds various structures together and also provides cushioning and support. Viewed under a microscope, the cells that make up adipose tissue consist almost entirely of **fat**; even the cell nucleus is pushed over to the edge of the cell. This appearance is consistent with the function of adipose tissue as the major storage site for fat. The fat is usually in the form of **triglycerides**.

There are two types of adipose tissue: white and brown. Most adipose tissue is of the white type. White adipose tissue has three functions: heat insulation, cushioning, and as an energy source. The latter is the most important. The insulation function is mainly attributable to the adipose tissue found just underneath the skin--the subcutaneous adipose tissue--as this tissue conducts heat only one third as efficiently as other tissues. Lastly, adipose tissue surrounds internal **organs**, and helps protect them from jarring trauma.

Adipose tissue is an important biological energy source because the fat it contains yields more energy per unit weight than either carbohydrate or protein. Thus, not as much adipose tissue needs to be laid down by the body to produce as much energy as the other two materials. Also, adipose tissue is hydrophobic (from the Latin for "water hating"), so the advantages of energy and insulation do not come at a price of carrying around a huge excess of water, which would make mobility difficult.

White adipose tissue is used as a substrate, or starting material, from which energy is generated by a series of biochemical reactions. In contrast, brown adipose tissue yields energy directly, without intervening chemical breakdown reactions. Brown adipose tissue takes its name from its color, which is due to the many **blood** vessels and **mitochondria** (the **ATP** factories of a cell) rich cells that are present in the tissue. This adipose tissue is localized in the body, especially near the thymus and the **abdomen**.

While essential and beneficial as an energy and heat source, too much adipose tissue can be detrimental to health. Normal body content of adipose tissue is 15-20% of body weight in males and 20-25% in females. The condition of obesity, where body fat content exceeds these levels can be much higher, and has genetic and lifestyle causative factors.