

Elements in Human Body

The big four 96%:

Carbon 18% of body weight

The building brick of organic life.

Oxygen 65% of body weight

The element oxygen acts as an electron acceptor and oxidizing agent. It is found in all four of the major classes of organic molecules: protein, carbohydrates, lipids, and nucleic acids.

Hydrogen 10% of body weight

Bonds with most and the currency of charge – protons and electrons.

Nitrogen 3% of body weight

Humans get nitrogen from food. An important component of amino acids, which are used to build peptides and proteins and of nucleic acids DNA and RNA.

Major elements 3.5%:

Calcium 1.4% of body weight

99% stored in bones and teeth bound in structural compounds, such as hydroxyapatite. An important ion, used in muscle contraction, protein regulation and maintaining the body's pH, essential for enzyme function. If needed, the body will pull stored calcium out of the bones and teeth.

Phosphorous 1% of body weight

In the nucleic acids In the nucleus of every cell in the body, the cell membrane (phospholipids) high-energy compounds (ATP); a major component of outer bone; necessary for the reproductive system and sexual function; necessary for muscle tissue and growth; an essential nutrient for the nerves.

Potassium (0.25%)

important for proper membrane function, nerve impulses, and muscle contractions; essential in regulating the heart beat; major cation in cytoplasm; a primary electrolyte and alkalizer; attracts oxygen to tissues; helps eliminate toxins from the body.

Sodium (0.15%)

Stored in stomach walls, joints, and gallbladder; helps prevent blood clotting; important for membrane function, nerve impulses, and muscle contractions; major cation in body fluids; contributes to the alkalinity of the lymph and blood; works with the bicarbonate

buffer system in the digestive tract to prevent hydrochloric acid from burning stomach walls; helps retain calcium and cholesterol liquid in the body; helps with excretion of carbon dioxide (CO₂).

Sulfur 0.25%

Found in many amino acids as well as thiamine and biotin; necessary for developmental and neurological processes and for synthesis of collagen; detoxifies; increases blood circulation; reduces muscle cramping and back pain; removes inflammation; assists in the healing of muscles; helps the liver produce choline; an important element in nerves and the myelin sheath; stimulates flow of bile; regulates heart and brain function; promotes healthy skin, nails, and hair; helps lubricate joints.

Chlorine 0.15%

Important for membrane function, generation of ATP and water absorption; chloride is the major anion in body fluids and part of hydrochloric acid (HCl) in gastric juices.

Magnesium 0.005%

Required for activation of several enzymes; vital for strong bones and teeth; essential for brain and liver function; calms nerves; promotes cell growth; increases tissue elasticity; necessary for metabolism of ATP-ADP.

Trace elements 0.5%:

Boron

Assists and improves retention of calcium, magnesium, and phosphorus; necessary for brain function, memory and alertness as well as for the activation of vitamin D.

Chromium;

master regulator of insulin; potent metabolic hormone in the metabolism of proteins, carbohydrates, and fats; assists neurotransmitters; helps with the function of the brain, thyroid, and hormonal balance.

Cobalt

A vital part of vitamin B12; stimulates numerous enzymes; helps build red blood cells and with iron absorption.

Copper

Involved in the synthesis of hemoglobin, melanin, and elastin; an enzyme cofactor; part of some cytochromes in cell respiration; assists in phospholipid synthesis, protein metabolism, vitamin C oxidation, and the formation of RNA; supports the function of iron;

Iron

Essential for oxygen transport and energy capture; component of hemoglobin, myoglobin, and cytochromes in cell respiration. Too much iron in the diet can result in damage to the heart and liver.

Iodide

A major component of thyroid hormones (thyroxine and T3); necessary for the metabolism of fats and such minerals as calcium, silica, and phosphorus; essential for spleen, liver, and brain function; neutralizes albumin.

Flourine

Is found in teeth and bones. Outside of preventing tooth decay, its other functions in the body are unknown.

Manganese

Cofactor for some enzymes; because it is found with lecithin, it is involved in the synthesis of fatty acids and cholesterol; strengthens nerves and thought processes; element in body linings and connective tissues; helps with eyesight; enhances body's recuperative abilities and resistance to disease.

Molbydium

Is essential to virtually all life forms. In humans, it is important for transforming sulfur into a usable form. In nitrogen-fixing bacteria, it is important for transforming nitrogen into a usable form.

Selenium

A powerful antioxidant; vital to the immune system; major part of apoptosis (normal cell death in the body); helps maintain cell integrity; supports heart function; helps slow the aging process; delays oxidation of polyunsaturated fatty acids.

Zinc

is found in all body fluids, including urine as well as the moisture found in the eyes, mouth, lungs, and nose; a cofactor for enzyme function, especially carbonic anhydrase needed for carbon dioxide transport; part of peptidases needed for protein digestion; necessary for normal taste sensation; important in wound healing; a necessary part of DNA and for cell division and synthesis; necessary for hormone production and for the prostate gland; and a vital part of the immune system.

Germanium

helps activate various organs to attract more oxygen; expels harmful pollutants and pathogens from the body; helps maintain a strong immune system by assisting in the production of killer cells and T-suppressor cells; assists in electron transmissions.

Silicon**Tin****Vanadium**

Elemental Buddies

Na / K

Sodium is the chief ion outside the cell, potassium inside. Inside the cell, sodium concentrations are ten times lower than outside. Potassium concentration inside are about thirty times higher than outside. The difference across the membrane creates an electrochemical gradient known as membrane potential, which uses a lot of the body's energy to maintain itself. Without this tight control, muscles would suffer, especially the heart. The balance of Na/K in the body is tightly controlled by the kidneys.

Mg/Ca

interactions of magnesium and calcium are basic to all living cells and some are quite early on the evolutionary scale. For example, it was shown in the amoeba almost a century ago that magnesium prevents calcium entry into the cell when calcium is present in excess. In addition, magnesium prevents calcium exit during calcium-deficient conditions and "in the presence of magnesium, less calcium is required for optimum movement" in these one-celled animals. These same basic cellular calcium-magnesium interactions are at work in human cells.

Zn/Cu

Zinc and copper are antagonists. The balance between these two trace elements is an example of the effects of biological dualism. While zinc toxicity is possible, far more common is zinc deficiency and copper toxicity. Zinc is an essential trace element that activates several hundred enzymatic reactions.