



Integrative Medical Centre's anti-aging glossary

ACh (Acetylcholine) is a neurotransmitter which plays an important role in memory, used for control of sensory input signals and muscular control. ACh is a stimulatory neurotransmitter. When released by muscle nerves, it makes those muscles contract. It's made from the precursor nutrient choline and there is some evidence that increased dietary choline can increase production and use of acetylcholine. Also, many medicines affect the production and release of this neurotransmitter.

Age-related macular degeneration (AMD) is a disease that progressively destroys the central portion of the retina, which is called the macula. AMD is the leading cause of severe vision loss in people aged 50 and over in the Western World. As many as 30 million people are thought to suffer from the condition. There are two types of AMD – the wet type and the milder and more common dry type. Although the wet form of AMD accounts for just 10-15% of all cases of AMD, it's responsible for 90% of severe vision loss associated with the disease. Some research suggests that taking supplements of zinc and the antioxidants vitamin C, vitamin E, and beta-carotene may help to slow the progression of wet AMD.

Age pigment (see lipofuscin).

Agonist is an agent that stimulates or increases the secretion from a gland.

Alzheimer's disease, also called senile dementia Alzheimer's type (SDAT), is characterised by a general loss of intellectual ability and impairment of memory, judgment and abstract thinking, as well as changes in personality. Other symptoms include loss of speech, disorientation and apathy. Alzheimer's disease is the most common cause of dementia, rarely occurring before the age of 50. The disease takes from a few months to four or five years to progress to complete loss of intellectual function.

Amino acid is an organic acid containing an amine (ammonia-like) chemical group. Amino acids are put together by your body in highly specific ways to manufacture proteins.

Amyloid plaque is a build up of beta-amyloid protein. Amyloid plaques are one of the characteristic structural abnormalities found in the brains of Alzheimer patients. Upon autopsy, the presence of amyloid plaques and neurofibrillary tangles is used to positively diagnose the disease.

Antioxidants are nutrients or chemicals that react with, and neutralise, free radicals or chemicals that release free radicals. Antioxidants are also called free radical scavengers. Vitamins A, C, E and some of the B vitamins, beta-carotene, selenium and some key enzymes in your body are antioxidants. By intercepting the free radicals, antioxidants prevent them from damaging molecular structures such as your DNA (see free radicals).

Antagonist is an agent that prevents or reduces the secretion from a gland.

Apolipoprotein E (APOE) is a gene situated on chromosome 19 that codes for a protein in lipoproteins that are normal constituents of blood plasma, for example HDL (high density lipoprotein), LDL (low density lipoprotein) and VLDL (very low density lipoprotein).

There are a number of common variations (alleles) of the APOE gene, the most common of which are known as e2, e3 and e4. Research has shown that people who inherit one or more copies of the APOEe4 gene are at increased risk of developing Alzheimer's disease. Meanwhile, there's evidence to suggest that the relatively rare APOEe2 allele may offer some protection against the disease – it seems to be associated with a lower risk for Alzheimer's and a later age of onset if the disease does develop. APOEe3 is the most common form of the gene in the general population and is thought to have no effect on Alzheimer's risk.

Apoptosis, or programmed cell death, is a form of cell death in which a programmed sequence of events leads to the destruction of cells without releasing harmful substances into the surrounding area. Apoptosis plays an important role in health by eliminating aged cells, unnecessary cells and unhealthy cells. A protein called bcl-2 prevents apoptosis in normal healthy cells. However, many cancer cells, which would normally be destroyed by apoptosis because they proliferate too quickly, produce high levels of bcl-2 in order to evade destruction.

ATP (Adenosine triphosphate), the universal energy molecule, is created in the mitochondria of your cells using energy derived from the food you eat. All the cellular activities in your body use the energy released by splitting ATP.

Atrophy means the dying or death of a gland or organ.

Autoimmune disease is a type of illness that occurs when the body tissues are attacked by its own immune system. People suffering from autoimmune diseases tend to have unusual antibodies circulating in their blood that target their own body tissues. Autoimmune diseases are more common in women than in men. Examples of autoimmune diseases include systemic lupus erythematosus (SLE or lupus), rheumatoid arthritis, multiple sclerosis, juvenile (type 1) diabetes, Addison disease, vitiligo, pernicious anaemia, glomerulonephritis and pulmonary fibrosis.

C-reactive protein (CRP) is an inflammatory marker – a protein that the body releases in response to inflammation. Elevated levels of CRP in the blood usually mean that there's inflammation somewhere in the body. CRP is not normally present in the blood of a healthy patient. CRP levels can increase by as much as 1,000 times with inflammation. Conditions that commonly lead to marked changes in CRP include infection, trauma, surgery, burns, inflammatory conditions and advanced cancer. Moderate changes occur after strenuous exercise, heatstroke and childbirth. Psychological stress and some psychiatric illnesses can cause small changes in CRP levels. CRP is the only inflammatory marker that's been found to be an indicator of heart health. Doctors often carry out a CRP test at the same time as cholesterol and other lipid tests to help predict a patient's risk of heart attack.

Catecholamines are the class of neurotransmitters that includes norepinephrine and dopamine.

Catoplexy is a condition of sudden muscular weakness or fatigue.

Central nervous system (CNS) is the brain, spinal cord and their associated nerves.

Cerebrovascular insufficiency is an inadequate supply of blood to the brain because of a narrowing of the blood vessels which lead to, or are in, various areas of the brain.

Cholinergic are the parts of the nervous system that use acetylcholine as a neurotransmitter.

Chromosomes are double stranded DNA helices.

Cross linking is an oxidation reaction in which undesirable bonds form between nucleic acids (RNA and DNA) or between proteins. For example, bite into an apple and watch it go yellow over time. This is protein cross linking.

Dendrites are the fine network of branches that extend from the body of a nerve, receiving impulses and carrying them into the centre of the cell.

DHT (dihydrotestosterone) is a conversion of testosterone that's considered to be an aging biomarker. Among its affects are the appearance of body hair; the loss of scalp hair and the onset of prostate gland problems.

DMAE (demethylaminoethanol) is found in small amounts in the brain and is known for its brain enhancing affects.

DNA (Deoxyribonucleic acid) is the genetic blueprint that resides in the nucleus of every cell of every living organism. Researchers believe that free radical damage to the DNA is directly involved in aging and cancer.

Dopamine is a neurotransmitter critical to fine motor co-ordination, immune function, motivation, insulin regulation, physical energy, thinking, short term memory, emotions such as sexual desire, and autonomic nervous system balance.

Dopaminergic are the parts of the nervous system which use dopamine as a neurotransmitter.

Double blind is a type of scientific experiment in which neither the subjects nor the researchers know who is receiving an active substance and who is receiving a placebo. This type of experiment helps to eliminate personal bias from research.

Double-blind crossover is a study where, at one point in the experiment, all of the subjects switch from an active substance to a placebo or vice versa.

Endocrine system is a term for a group of glands, specifically the pituitary, thyroid, thymus, pancreas, adrenal, testes and ovaries.

Free radicals are highly chemically reactive atoms, molecules or molecular fragments with a free or unpaired electron. Free radicals are produced in many different ways including through normal metabolic processes, ultraviolet radiation from the sun, nuclear radiation and the breakdown in the body of spoiled fats. Free radicals have been implicated in aging, cancer, cardiovascular disease and other kinds of damage to the body (see antioxidants).

Free radical scavengers are the cascade of chemical reactions that occurs when a free radical reacts with another molecule in order to gain an electron. The molecule that loses an electron to the free radical then becomes a free radical, repeating the process until the energy of the free radical is spent, or the reaction is stopped by an antioxidant. In biological systems, this cascade can damage important molecules like DNA.

GABA (gamma aminobutyric acid) is an amino acid which acts as an inhibitory neurotransmitter.

Growth hormone (GH) is secreted by the pituitary gland. GH stimulates growth and repair of the body as well as the activities of the immune system. With age, GH release diminishes. Also known as hGH or human growth hormone.

Hippocampus is an area of the brain believed responsible for memory and personality.

Hormone is Latin for "chemical messenger", such as growth hormone, testosterone or insulin.

Huntington disease is a hereditary disorder characterised by mental and physical deterioration that ultimately leads to death. It's sometimes referred to as Huntington's chorea due to the involuntary rapid movement of limbs (chorea), which are a symptom of the disease. This is caused by loss of neurons, or nerve cells, in the brain. Huntington's is caused by a faulty gene known as HD, which is located on chromosome 4. Diagnosis is by genetic testing. Currently, there's no cure, although medication may be used to control the debilitating symptoms.

Hypersomnia is a condition that means "someone who sleeps too much".

Hyposomnia is a condition that means "someone who sleeps very little" – like an insomniac.

Hypothalamus is the area of the brain that is believed to be the command centre giving instructions to the endocrine system.

Hypoxia is a condition of lowered oxygen levels in the blood which promotes free radical activity in the body.

Infarct refers to tissue which has died due to a lack of oxygen resulting from a blood clot or blocking of an artery.

Inhibitory neurotransmitters decrease the electrochemical activity of neurons. GABA and serotonin are inhibitory neurotransmitters.

Learning is defined as a change in neural function as a consequence of experience.

Lipofuscin is the brown waste material deposited in skin and nerve cells that's commonly called "age spots". Lipofuscin is made of free radical damaged proteins and fats.

Liver spots are also deposits of lipofuscin in the skin.

Mitochondria are structures in cells that act as power plants.

Monoamine oxidase (MAO) is an enzyme which breaks down certain neurotransmitters such as serotonin, dopamine and norepinephrine in the brain.

Narcolepsy is a condition when someone often falls asleep during the day.

Nerves are cells which carry information to and from the central nervous system.

Nerve growth factor (NGF) is a naturally occurring hormone that stimulates the growth of neurones.

Neurites are the tiny projections growing from each nerve cell which carries information between the cells. A nerve cell may have over 100,000 neurites growing out of it, each connected to another nerve cell.

Neurochemical is a chemical naturally occurs in the nervous system and plays a part in its functioning.

Neurodegenerative disease is a neurological disorder marked by the loss of nerve cells. Alzheimer's, Huntington's and Parkinson's diseases are neurodegenerative diseases.

Neurofibrillary tangles are an accumulation of twisted protein fragments inside neurons. They are one of the characteristic structural abnormalities found in the brains of patients with Alzheimer's disease. Upon autopsy, the presence of amyloid plaques and neurofibrillary tangles is used to positively diagnose the disease.

Neuron is a nerve cell.

Neurotransmitter is one of the many chemicals that carry impulses between nerve cells.

Neurotrophic factor is a molecule, typically a protein, such as nerve growth factor (NGF) that promotes nerve cell growth, repair and survival.

Niacin is the active part of vitamin B3.

Norepinephrine, also known as noradrenaline, is an excitatory neurotransmitter involved in alertness, concentration, aggression and motivation, among other behaviours. It's made in the brain from the amino acid phenylalanine.

Oxidation is a chemical reaction in which an electron is taken from a molecule of the oxidised substance.

Pancreas is the gland responsible for insulin production.

Parkinson's disease is a chronic disease of the central nervous system caused by lowered levels of the inhibitory neurotransmitter dopamine. Symptoms include muscular tremors and weakness.

Pituitary gland is at the base of the brain which secretes several different hormones involved in key metabolic processes.

Placebo is an inert compound usually given to a portion of the subjects in a scientific experiment, in order to distinguish the psychological effects of the experiment from the physiological effects of the medication being tested.

Precursor is a chemical that can be converted by the body into another.

Pregnenolone is the grandmother steroid hormone produced in the mitochondria.

Receptors are sites on the outside of cells where particular messenger molecules such as hormones attach themselves. This causes changes inside the cell.

Regeneration is the regrowth of cells, tissues, organs or limbs.

RNA (ribonucleic acid) carries instructions from DNA in the nucleus to cell polyribosomes, where proteins are made according to the RNA instructions.

Senility is the aging related loss of mental faculties.

Sencequence is the reduction and decline of a gland's output with age.

Serotonin is an inhibitory neurotransmitter required for sleep.

Stimulatory neurotransmitter increases electro-chemical activity in the nerve cells. Norepinephrine is a stimulatory neurotransmitter.

Stroke is a rupture in a blood vessel in the brain, often with disastrous effects depending upon where the rupture occurs.

Superoxide dismutase (SOD) is a zinc and copper or manganese containing enzyme which reacts with superoxide radicals to convert them to less dangerous chemical entities.

Superoxide radical is a free radical thought to play a central role in arthritis and cataract formation.

Synapse is the gap between nerve cells.

Synergies form when compounds are combined and their effects are more than the sum of their individual effects; the compounds are said to have positive synergy.

Systemic means "throughout the entire body".

Toxic means "poisonous". Everything, including water and oxygen, is toxic in sufficiently high doses.

Thymus is the master gland of the immune system located behind the breastbone.

Thyroid is the gland located in the centre of the brain responsible, among other things, for temperature regulation.

Triglycerides are fats found in the bloodstream.

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