Certificate in Functional Medicine and Wellness Coaching

Biology of Chronic Disease

Acute-phase response: A series of physiological changes that occur in response to tissue injury, infection, or other forms of stress. This response involves the release of pro-inflammatory cytokines, which initiate a cascade of events leading to fever, leukocytosis, and increased acute-phase protein synthesis.

Adipokines: Hormones produced by adipose tissue that play a role in energy metabolism, inflammation, and insulin sensitivity. Examples of adipokines include leptin, adiponectin, and resistin.

Age-related diseases: Chronic conditions that are more common in older adults, such as cardiovascular disease, diabetes, cancer, and neurodegenerative disorders. These diseases are often associated with chronic inflammation, oxidative stress, and changes in cellular and molecular processes.

Autophagy: A cellular process that involves the degradation and recycling of damaged organelles, proteins, and other cellular components. Autophagy plays a critical role in maintaining cellular homeostasis and has been implicated in the pathogenesis of several chronic diseases.

Biomarkers: Objective indicators of biological or pathological processes that can be measured in bodily fluids or tissues. Biomarkers can be used to diagnose and monitor chronic diseases, assess risk factors, and evaluate the effectiveness of treatments.

Chronic disease: A long-term medical condition that requires ongoing management and care. Chronic diseases are often progressive and can lead to significant disability and reduced quality of life. Examples of chronic diseases include heart disease, diabetes, cancer, and neurodegenerative disorders.

Chronic inflammation: A prolonged and persistent inflammatory response that can contribute to the development and progression of chronic diseases. Chronic inflammation is often associated with the activation of immune cells, the release of pro-inflammatory cytokines, and the production of reactive oxygen species.

Cytokines: Small signaling proteins that are involved in cell-to-cell communication. Cytokines play a critical role in regulating immune responses, inflammation, and hematopoiesis. Examples of cytokines include interleukins, interferons, and tumor necrosis factor-alpha.

Epigenetics: The study of heritable changes in gene expression that do not involve changes to the underlying DNA sequence. Epigenetic modifications, such as DNA methylation and histone modification, can be influenced by environmental factors and lifestyle choices and have been implicated in the development and progression of chronic diseases.

Free radicals: Highly reactive molecules that contain unpaired electrons. Free radicals can cause damage to cellular components, such as DNA, proteins, and lipids, and have been implicated in the development and progression of chronic diseases.

Genetic predisposition: A genetic factor that increases an individual's susceptibility to developing a particular chronic disease. Genetic predisposition does not guarantee that a person will develop the disease, but rather increases the likelihood.

Glycemic index: A measure of the impact of a particular food on blood sugar levels. Foods with a high glycemic index cause a rapid and significant increase in blood sugar levels, while foods with a low glycemic index cause a slower and more gradual increase.

Heart disease: A group of conditions that affect the heart and blood vessels, including coronary artery disease, heart failure, and arrhythmias. Heart disease is a leading cause of death and disability worldwide.

Inflammation: A localized response to tissue injury or infection that involves the activation of immune cells, the release of pro-inflammatory cytokines, and the production of reactive oxygen species. Inflammation is a critical component of the immune response, but can also contribute to the development and progression of chronic diseases.

Insulin resistance: A condition in which cells become less responsive to the effects of insulin, leading to elevated blood sugar levels. Insulin resistance is a key factor in the development of type 2 diabetes and is often associated with obesity, physical inactivity, and a sedentary lifestyle.

Leptin: A hormone produced by adipose tissue that regulates appetite and energy metabolism. Leptin signals the brain to reduce food intake and increase energy expenditure in response to changes in body fat mass.

Lifestyle factors: Behaviors and habits that can influence the risk of developing chronic diseases, such as smoking, alcohol consumption, physical inactivity, and diet. Lifestyle factors can be modified through interventions such as counseling, education, and behavior change strategies.

Microbiome: The community of microorganisms, including bacteria, viruses, and fungi, that inhabit various surfaces of the human body, such as the skin, mouth, and gut. The microbiome plays a critical role in maintaining health and has been implicated in the development and progression of chronic diseases.

Mitochondrial dysfunction: Impaired function of the mitochondria, the organelles responsible for generating energy in the form of ATP. Mitochondrial dysfunction has been implicated in the development and progression of several chronic diseases, including neurodegenerative disorders, cardiovascular disease, and diabetes.

Neurodegenerative disorders: A group of conditions that affect the structure and function of the

nervous system, including Alzheimer's disease, Parkinson's disease, and multiple sclerosis. Neurodegenerative disorders are often associated with chronic inflammation, oxidative stress, and changes in cellular and molecular processes.

Nutrigenomics: The study of the effects of nutrients and dietary factors on gene expression and cellular function. Nutrigenomics has the potential to identify dietary strategies for preventing and managing chronic diseases.

O oxidative stress: An imbalance between the production of reactive oxygen species and the body's ability to detoxify and repair the resulting damage. Oxidative stress has been implicated in the development and progression of chronic diseases, including cardiovascular disease, diabetes, and neurodegenerative disorders.

Pro-inflammatory cytokines: Signaling proteins that promote inflammation and immune responses. Pro-inflammatory cytokines include interleukins, interferons, and tumor necrosis factor-alpha.

Reactive oxygen species: Highly reactive molecules that contain oxygen and can cause damage to cellular components, such as DNA, proteins, and lipids. Reactive oxygen species are produced during normal cellular metabolism and can also be generated in response to stress, infection, and inflammation.

Resistin: A hormone produced by adipose tissue that has been implicated in the development of insulin resistance and type 2 diabetes. Resistin is often elevated in obesity and physical inactivity.

Telomeres: Protective caps on the ends of chromosomes that shorten with each cell division. Telomere shortening has been associated with aging and the development of several chronic diseases, including cardiovascular disease and cancer.

Type 1 diabetes: A chronic autoimmune disorder in which the immune system destroys the insulin-producing cells in the pancreas, leading to elevated blood sugar levels. Type 1 diabetes typically presents in childhood or adolescence and requires lifelong insulin therapy.

Type 2 diabetes: A chronic metabolic disorder in which cells become less responsive to the effects of insulin, leading to elevated blood sugar levels. Type 2 diabetes is often associated with obesity, physical inactivity, and a sedentary lifestyle.

Vascular inflammation: Inflammation of the blood vessels, which can contribute to the development and progression of cardiovascular disease. Vascular inflammation is often associated with the activation of immune cells, the release of pro-inflammatory cytokines, and the production of reactive oxygen species.

Visceral fat: Fat that is stored in the abdominal cavity and surrounding internal organs. Visceral fat is associated with an increased risk of several chronic diseases, including cardiovascular disease, diabetes, and cancer.

Xenobiotics: Chemical substances that are foreign to the body, such as drugs, pollutants, and toxins. Xenobiotics can disrupt cellular function and have been implicated in the development and progression of chronic diseases.