# Understanding Autoimmune Diseases

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**When an intruder invades your body – like a cold virus or bacteria on a thorn that pricks your skin – your immune system protects you. It tries to identify, kill, and eliminate the invaders that might hurt you. But sometimes problems with your immune system cause it to mistake your body's own healthy cells as invaders and then repeatedly attack them. This is called an autoimmune disease. (*Autoimmune* means immunity against the self.)**

## The Immune System

**Your immune system is the network of cells and tissues throughout your body that work together to defend you from invasion and infection. You can think of it as having two parts: the innate and the acquired immune systems.**
**The more primitive innate (or inborn) immune system activates white blood cells to destroy invaders. The innate system alerts the body to danger when it senses the presence of parts that are often found in many viruses or bacteria. The acquired (or adaptive) immune system develops as a person grows. It "remembers" different invaders so that it can fight them better if they come back. When the immune system is working properly, foreign invaders (antigens) provoke the body to produce proteins called antibodies and specific types of white blood cells that help in defense. The antibodies attach to the invaders so that they can be recognized and destroyed.**

**Autoimmune diseases refer to problems with the acquired immune system's reactions. In an autoimmune reaction, antibodies, or immune cells, attach to the body's own healthy tissues by mistake, signaling the body to attack them.**
**Autoimmune Diseases**

**Autoimmune diseases can affect almost any part of the body, including the heart, brain, nerves, muscles, skin, eyes, joints, lungs, kidneys, glands, the digestive tract, and blood vessels.**

**The classic sign of an autoimmune disease is inflammation, which can cause redness, heat, pain, and swelling. How an autoimmune disease affects you depends on what part of the body is targeted. If the disease affects the joints, as in rheumatoid arthritis and psoriatic arthritis, you might have joint pain, stiffness, and loss of function. If it affects the thyroid, as in Graves' disease and thyroiditis, it might cause tiredness, weight gain, and muscle aches. If it attacks the skin, as it does in scleroderma/systemic sclerosis, vitiligo, and systemic lupus erythematosus (SLE), it can cause rashes, blisters, and color changes.**

**Many autoimmune diseases don't restrict themselves to one part of the body. For example, SLE can affect the skin, joints, kidneys, heart, nerves, blood vessels, and more. Rarely, rheumatoid arthritis can affect your heart, blood vessels, and lungs, in addition to the joint problems it typically causes.**

**No one is sure what causes autoimmune diseases. In most cases, a combination of factors is probably at work. For example, you might have a genetic tendency to develop a disease.**

**These are some of the diseases that fall into the autoimmune category:**

**alopecia areata**
**autoimmune hemolytic anemia**
**autoimmune hepatitis**
**Crohn's disease**
**dermatomyositis**
**diabetes (type 1)**
**glomerulonephritis**
**Graves' disease**
**Guillain-Barré syndrome**
**idiopathic thrombocytopenic purpura**
**myasthenia gravis**
**myocarditis**
**multiple sclerosis**
**pemphigus/pemphigoid**
**pernicious anemia**
**polyarteritis nodosa**
**polymyositis**
**primary biliary cirrhosis**
**psoriasis**
**psoriatic arthritis**
**rheumatoid arthritis**
**scleroderma/systemic sclerosis**
**Sjögren's syndrome**
**systemic lupus erythematosus**
**thyroiditis**
**uveitis**
**vitiligo**
**Wegener's granulomatosis**

**The treatment depends on the disease, but in most cases one important goal is to reduce inflammation. Sometimes doctors prescribe corticosteroids or immunosuppressive drugs. For additional information on the diseases listed above, visit the National Library of Medicine's Medline Plus (http://www.nlm.nih.gov/medlineplus/), a component of the National Institutes of Health.**

**Progress and Promise**

**Further research should continue to enhance the understanding of the genetics and causes of autoimmune disorders and result in improvements in diagnosing and treating these diseases. For information on autoimmune disease research that is supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases, visithttp://www.niams.nih.gov/Research/default.asp. NIAMS works with other NIH Institutes, Federal agencies, and private organizations in the Autoimmune Diseases Coordinating Committee, which coordinates research in autoimmune diseases. For a listing of federally and privately supported clinical trials for a variety of autoimmune disorders, visit www.clinicaltrials.gov.**

**Key Words:**

**Acquired immune system – The part of the immune system that develops as a person grows. It employs antibodies and specialized white blood cells to fight harmful substances.**

**Antibody – A special protein produced by the body's immune system that recognizes and helps fight infectious agents and other foreign substances that invade the body.**

Antigen **– A foreign substance that triggers the production of antibodies when it is introduced into the body.**

Autoimmune disease **– A disease that results when the immune system mistakenly attacks the body's own tissues.**

**Corticosteroids – Potent anti-inflammatory hormones that are made naturally in the body or synthetically (man-made) for use as drugs. They are also called glucocorticoids. The most commonly prescribed drug of this type is prednisone.**

**Diabetes, type 1 – A condition in which the immune system destroys insulin-producing cells of the pancreas, making it impossible for the body to use glucose (blood sugar) for energy properly. Type 1 diabetes usually occurs in children and young adults.**

**Graves' disease – An autoimmune disease of the thyroid gland that results in the overproduction of thyroid hormone. This causes such symptoms as nervousness, heat intolerance, heart palpitations, and unexplained weight loss.**

**Immune system – A complex network of specialized cells and organs that work together to defend the body against attacks by foreign invaders, such as bacteria and viruses.**

**Immunosuppressive drugs – Drugs that suppress the immune response and can be used to treat autoimmune disease. Unfortunately, because these drugs also suppress normal immunity, they leave the body at risk for infection.**
Inflammation **– A reaction of body tissues to injury or disease, typically marked by five signs: swelling, redness, heat, pain, and loss of function.**

**Innate immune system – The part of the immune system that is more primitive. It employs types of white blood cells called granulocytes and monocytes to destroy harmful substances.**

**Psoriatic arthritis - A type of arthritis associated with psoriasis, a chronic skin disease that occurs when cells in the outer layer of the skin reproduce faster than normal.**

**Rheumatoid arthritis – A disease in which the immune system attacks the linings of the joints. This results in joint pain, stiffness, swelling, and destruction.**
Scleroderma/systemic sclerosis **– An autoimmune disease characterized by abnormal growth of connective tissue in the skin and blood vessels. In more severe forms, connective tissue can build up in the kidneys, lungs, heart, and gastrointestinal tract, leading in some cases to organ failure.**

**Systemic lupus erythematosus – An autoimmune disease affecting primarily young women. Many parts of the body can be affected, including the joints, skin, kidneys, heart, lungs, blood vessels, and brain.**

**Thyroiditis – An inflammation of the thyroid gland that causes the gland to become underactive. This results in symptoms such as fatigue, weakness, weight gain, cold intolerance, and muscle aches.**

**Vitiligo – A disorder in which the immune system destroys pigment-making cells called melanocytes. This results in white patches of skin on different parts of the body.**

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