



## UNDERSTANDING AUTOIMMUNE DISEASES

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 attacks 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 acquired and the innate immune systems.

The acquired (or adaptive) immune system develops as a person grows. It "remembers" invaders so that it can fight them if they come back. When the immune system is working properly, foreign invaders provoke the body to activate immune cells against the invaders and to produce proteins called antibodies that attach to the invaders so that they can be recognized and destroyed. The more primitive innate (or inborn) immune system activates white blood cells to destroy invaders, without using antibodies.

Autoimmune diseases refer to problems with the acquired immune system's reactions. In an autoimmune reaction, antibodies and immune cells target 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, 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. Type 1 diabetes can affect your glands, eyes, kidneys, muscles, and more.

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The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the U.S. Department of Health and Human Services' National Institutes of Health (NIH), is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; the training of basic and clinical

scientists to carry out this research; and the dissemination of information on research progress in these diseases. For more information about the NIAMS, call the information clearinghouse toll free at 301-495-4484 or 877-22-NIAMS or visit the NIAMS website at [www.niams.nih.gov](http://www.niams.nih.gov).

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 and then, under the right conditions, an outside invader like a virus might trigger it.

The list of diseases that fall into the autoimmune category includes:

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

The treatment depends on the disease, but in most cases one important goal is to reduce inflammation. Sometimes doctors prescribe corticosteroids or immunosuppressive drugs.

## 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, visit [www.niams.nih.gov/Research/default.asp](http://www.niams.nih.gov/Research/default.asp). For a listing

of federally and privately supported clinical trials for a variety of autoimmune disorders, visit [www.clinicaltrials.gov](http://www.clinicaltrials.gov).

## KEY WORDS

**Acquired immune system.** The part of the immune system that develops as a person grows. It employs antibodies and immune 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. 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.

*The National Institutes of Health (NIH)—The Nation's Medical Research Agency—includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. It is the primary Federal agency for conducting and supporting basic, clinical, and translational medical research, and it investigates the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit [www.nih.gov](http://www.nih.gov).*

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## FOR YOUR INFORMATION

This publication contains information about medications used to treat the health condition discussed here. When this publication was printed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact the U.S. Food and Drug Administration (FDA) toll free at 888–INFO–FDA (888–463–6332) or visit its website at [www.fda.gov](http://www.fda.gov). For additional information on specific medications, visit [Drugs@FDA](mailto:Drugs@FDA) at [www.accessdata.fda.gov/scripts/cder/drugsatfda](http://www.accessdata.fda.gov/scripts/cder/drugsatfda). [Drugs@FDA](mailto:Drugs@FDA) is

a searchable catalog of FDA-approved drug products.

For updates and questions about statistics, please contact the Centers for Disease Control and Prevention's National Center for Health Statistics toll free at 800–232–4636 or visit its website at [www.cdc.gov/nchs](http://www.cdc.gov/nchs).