Biological Therapy (Immunotherapy)

What is biological therapy?

Biological therapy is medicine that helps the body's immune system fight cancer. It is also called:

- Immunotherapy
- Biological response modifier (BRM) therapy
- Biotherapy

Your immune system works to protect and defend your body against foreign invaders, such as bacteria or viruses. The immune system can also be used to help find and kill cancer cells.

Biological therapy does this by:

- Stopping or controlling the processes that allow cancer to grow
- Making cancer cells easier to find by the immune system so they can be killed
- Increasing the killing power of immune system cells
- Training immune cells to fight cancer cells
- Stopping cancer cells from spreading to other parts of the body

Biological therapy can be used alone to treat cancer. Or it can be used with other treatments. These include chemotherapy and radiation therapy.

How does the immune system fight cancer?

The immune system has different types of white blood cells. Each type of white blood cell has a different way to fight against foreign or diseased cells, including cancer. These types of white blood cells are in the bloodstream. They flow to every part of the body. They protect you from cancer and other diseases.

The types of white blood cells include:

- **Lymphocytes.** These include:
    - **B cells.** These make antibodies that tag foreign or abnormal cells. This is so other parts of the immune system can destroy them.
    - **T cells.** These attack cancer cells. They also tell other immune system cells to defend the body.
    - **Natural killer cells.** These cells find, stick to, and kill foreign or damaged cells in the body.
- **Macrophages.** These are white blood cells that swallow foreign particles. They also tell other immune system cells to do the same.
- **Dendritic cells.** These bring the foreign cells to the immune system.

What are the types of biological therapy?

There are many types of biological therapy used to treat cancer. They include:

- Nonspecific immunomodulating agents

- Colony-stimulating factors
- Monoclonal antibodies
- Vaccine therapy
- CAR T-cell therapy

Read below to learn more about each type.

Nonspecific immunomodulating agents

These medicines boost the immune system in a general way. The 2 types often used to treat cancer are:

- **Interferons.** Interferons are a natural type of biological response modifier (BRM) in the body. They are also made in the lab. They improve the way the immune system acts against some kinds of cancer cells. The medicine may work directly on cancer cells to slow their growth. Some interferons may also tell white blood cells to fight cancer cells.
- **Interleukins.** These are proteins called cytokines. They are naturally in the body. They can also be made in a lab. They boost the growth and activity of many immune cells. This can help the immune cells destroy cancer cells.

Colony-stimulating factors

These medicines help stem cells in the bone marrow make more white blood cells. White blood cells are part of your immune system. They help you fight off germs. Chemo and other cancer treatments slow the bone marrow’s process for making new white blood cells. This puts you more at risk for infections.

Monoclonal antibodies

These are medicines that stick to certain parts of cancer cells. These medicines are made in a lab. Some of these antibodies work by tagging cancer cells. This helps them to be found and killed by parts of the immune system. Others work by stopping some functions that cancer cells need to survive. In some cases, the antibodies are attached to another substance. This may be another anticancer medicine, a radioactive substance, or another BRM. When the antibodies attach to cancer cells, they send the other substance into the cancer. This helps to destroy the cancer cells.

Vaccine therapy

Vaccine therapy is a growing area of cancer research. Vaccine therapy may help the body's immune system start attacking the cancer cells. For infectious illness, such as flu, vaccines are given before the disease starts. But cancer vaccines are given after the disease starts. This is done when the amount of cancer is small. Scientists are testing vaccines for treating many types of cancer. A vaccine may be used with other types of biological therapy.

CAR T-cell therapy

CAR T-cell therapy takes the T cells from a person's blood and changes them in a lab to add a gene for a receptor (chimeric antigen receptor or CAR). This helps the T cells find and destroy cancer cells. The changed T cells are then put back in the person's body. Some people may have chemotherapy before they receive the CAR T-cell infusion. This helps make the CAR T cells more effective.

Side effects of biological therapy

Side effects vary depending to the type of therapy given. They may be mild or severe. Or you may have no side effects. Ask your healthcare team what side effects you may expect for your specific treatment. Side effects may include:

- Skin rash, redness, itching and dryness
- Fever
- Chills
- Nausea
- Vomiting
- Loss of appetite
- Extreme tiredness (fatigue)
- Mild to severe allergic reaction
- Low blood pressure
- Flu-like symptoms, such as fever, chills, aches, and fatigue
- A rash or swelling at the injection site
- Headaches
- Confusion
- Tremors

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Talk with your healthcare team about what side effects you should watch for and when they should be reported. Your healthcare team will also watch you for these side effects.