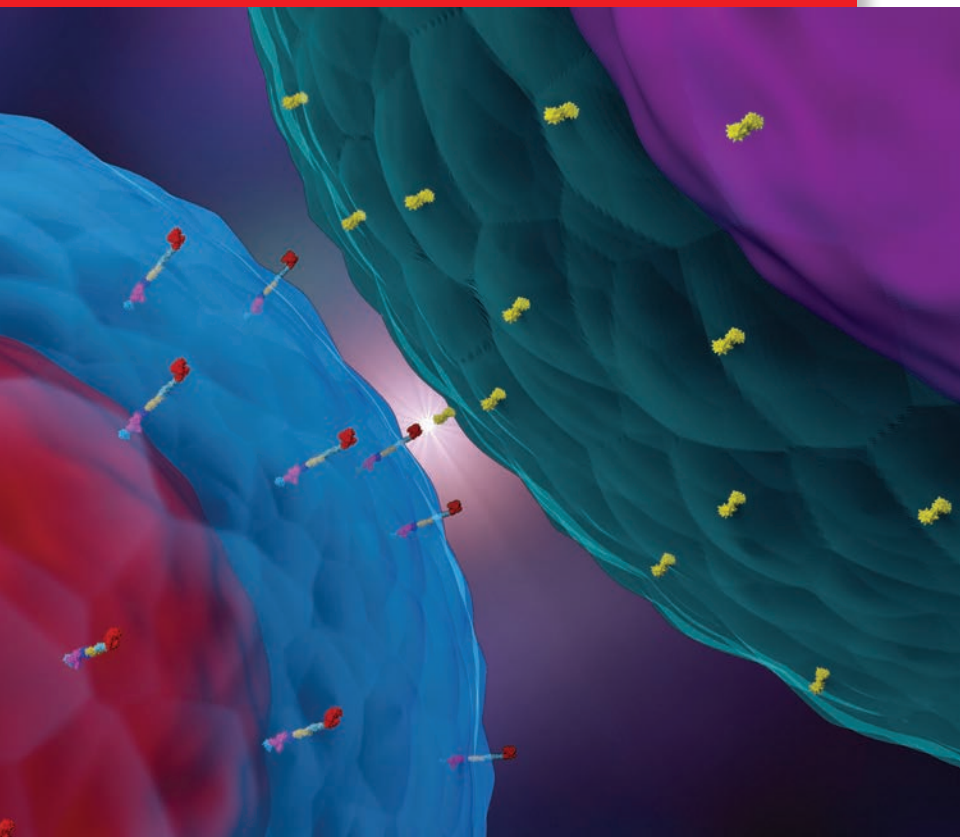
CLL SOCIETY

What to Know About the Use of

CAR-T Therapy

for Chronic Lymphocytic Leukemia (CLL)

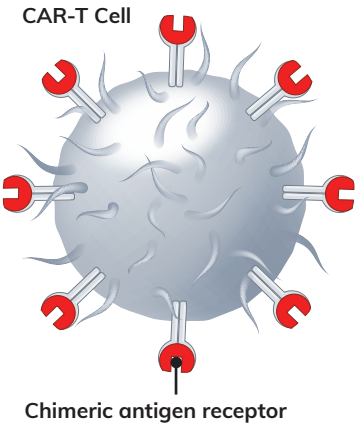


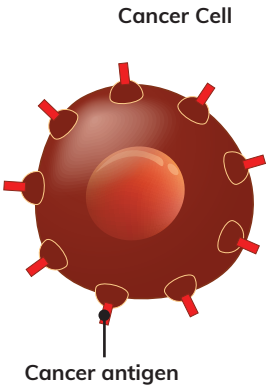
What is CAR-T therapy?

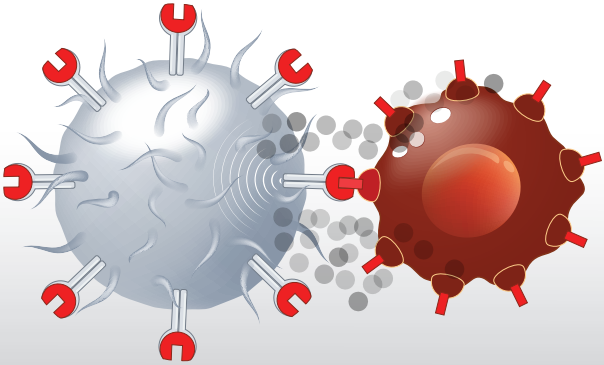
- CAR-T (Chimeric Antigen Receptor T-cell) therapy is a cellular immune treatment that genetically trains an individual's own immune system (specifically, the T-cells which are a type of white blood cell) to both recognize and attack cancerous CLL cells.
- CAR-T cells are sometimes said to be equivalent to giving patients a "living drug." This is because CAR-T cells are manufactured on an individual basis to target CD19, a surface protein found on many different types of blood cancers, including chronic lymphocytic leukemia.
- CLL cells are experts at hiding from the immune system. To better find and kill the cancer, the patient's T-cells are re-engineered to make artificial receptors called CARs. These CARs identify certain proteins (antigens) on the surface of the cancer cells and destroy them.

Why do those with CLL need to understand CAR-T therapy long before they ever need it?

- Many patients eventually become refractory (or stop responding) to different therapies.
- CAR-T therapy has been shown to work well in very tough-to-treat cases of CLL where the patient's disease has returned (relapsed) after many different treatments and few other treatment options remain.
- It's wise with CLL to be aware of, and seek to understand all possible therapies, and to plan ahead when it comes to anticipating what the next treatment options might be.





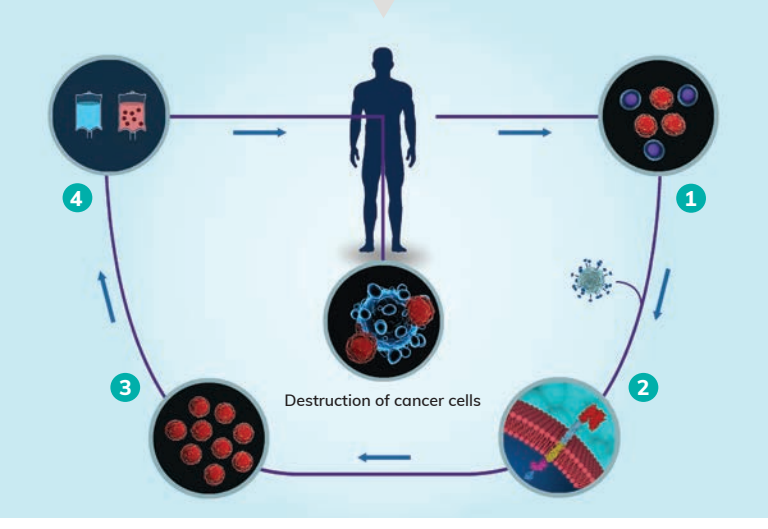


T-cell attacks and kills the cancer cell

The only proven curative therapy for CLL is a stem cell (bone marrow) transplant. There is reason to believe CAR-T therapy, which is also cell based, may be similarly effective and better tolerated.

How are CAR-T cells made?

1. An IV is placed and the patient is attached to a special machine where blood is withdrawn, but only the T-cells are collected through a process called leukapheresis. The patient's T-cells are then sent off to a laboratory for processing.
2. The patient's own T-cells are then genetically engineered to find and attack CLL cancer cells.
3. The newly re-engineered T-cells are multiplied in the lab until there are millions ready to be infused into the CLL patient's bloodstream.
4. The CAR-T cells are then returned to the patient's bloodstream where they recognize, attack, kill cancerous CLL cells, AND help guard against the re-occurrence of CLL cells.



How is CAR-T therapy administered?

- CAR-T infusions may be done inpatient or outpatient. But in either case, the patient must be closely monitored.
- The infusion usually takes less than an hour.
- After receiving CAR-T therapy, patients will be monitored closely for the next few weeks for any toxic reactions that may occur when CAR-T cells are rapidly expanding and killing the cancer.

How well does CAR-T therapy work for CLL?

- As many as 95% of CLL patients responded to CAR-T therapy in clinical trials.
- Up to 86% achieved a deep remission with no detectable CLL, also called undetectable measurable residual disease (uMRD). Among these patients, the responses can be very long-lived.

What are some advantages of CAR-T therapy in CLL?

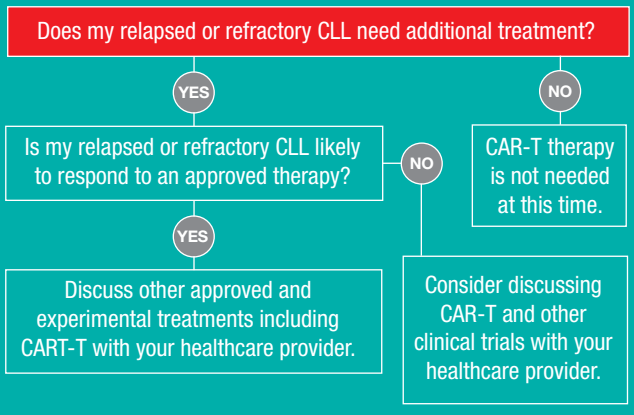
- CAR-T therapy removes some of the risks that come with transplanting someone else's immune cells via bone marrow transplant such as the condition known as graft versus host disease. This potentially life-threatening complication can occur when the transplanted stem cells from another person attack their new host, the patient receiving them.
- CAR-T therapy is the ultimate short-duration therapy because it is a single infusion that can provide many years of remission.

What are some possible disadvantages associated with CAR-T therapy?

- When CAR-T therapy is working, it may result in an excessive release of inflammatory chemicals called cytokines. This can result in cytokine release syndrome (CRS). CRS is a collection of potentially mild to life-threatening symptoms that might include fatigue, fever, nausea, chills, low blood pressure, rapid heart rate, headache, rash, scratchy throat, and shortness of breath.
- Neurological events (adverse changes in the nervous system) occasionally occur, ranging from mild confusion to seizures.
- Although these side effects can be unpleasant, worrisome, and in rare cases dangerous, they can almost always be fully and quickly resolved with supportive treatments.
- With successful CAR-T therapy, there may be a prolonged loss of all B-cells, a type of white blood cell that makes antibodies. This can impair the ability to fight infections. Should this occur, immunoglobulin replacement may be necessary to help prevent infection.
- CAR T-cell production is currently a slow process. Each batch of CAR T-cells is made for an individual patient on an "on-demand" basis and may take as long as four weeks to manufacture.
- CAR-T therapy is not yet FDA-approved for CLL, but there is hope that status will change in the future.

Where can more information be found about CAR-T therapy clinical trials for CLL?

- Ask your healthcare provider about whether a CAR-T clinical trial is a good option.
- Visit www.clinicaltrials.gov to search for CAR-T therapy trials that are currently open.



How does someone with CLL know when CAR-T therapy might be a good treatment option for them?

CAR-T therapy might be the best treatment option when:

- The person with CLL is well enough to tolerate a short duration of a potentially challenging therapy, **AND**
- Has a caregiver who can provide support during the CAR-T process, **AND**
- The person with CLL desires a type of treatment that offers a possible deep and long response even though it is still considered experimental, **OR**
- Other treatment options are unlikely to work or provide a deep and long-lasting response.

CAR-T is a new and different, powerful cell-based therapy that may offer CLL patients great hope for deep and durable remissions.

Where can I go to find more information about CAR-T therapy for CLL?

Please visit **CLLSociety.org/CAR-T**

CLL SOCIETY

Brought to you by CLL Society with support from Bristol Myers Squibb and Novartis.

CLL SOCIETY

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We envision a world in which the entire CLL community can equitably access quality education, support, and care, to lead healthier and richer lives.