

Transforming Care of
**HEMATOLOGIC
MALIGNANCIES**

Philanthropy Accelerates Hope and Healing



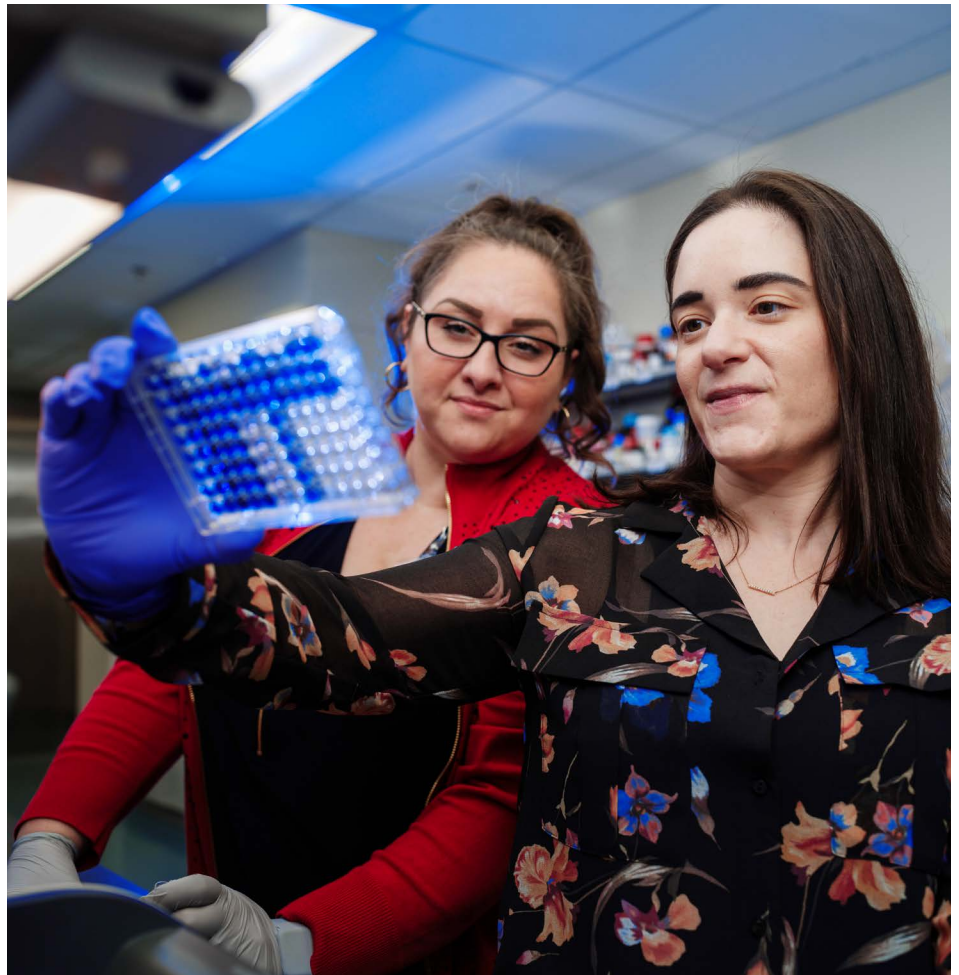
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MAYO CLINIC IS DEDICATED TO **TRANSFORMING OUTCOMES AND ENHANCING QUALITY OF LIFE** FOR PATIENTS WITH HEMATOLOGIC MALIGNANCIES, FROM COMMON TO RARE DISEASES.

For decades, Mayo Clinic's National Cancer Institute-Designated Comprehensive Cancer Center has led advances in hematologic malignancies, with internationally recognized expertise in bone marrow transplantation, novel cancer-targeting therapeutics, and advanced diagnostics capable of detecting single cancer cells among millions. Our physicians and scientists have pioneered staging and classification systems, developed molecular tests that define prognosis, and built extensive biobanks that inform long-term outcomes.

Driven by the needs of patients, research teams continue to develop the next generation of therapies, including cellular treatments designed to harness the immune system to eliminate cancer.

Generous support from
our benefactors makes
this possible.

At the same time, Mayo Clinic is broadening the availability of therapies that support durable remission for survivors and expanding access to care in communities.

These efforts are strengthened by the integration of artificial intelligence (AI) across research and clinical practice. By leveraging Mayo Clinic's expansive datasets, researchers are accelerating discovery through sophisticated analyses that characterize tumor biology, identify genetic drivers of disease, and uncover mechanisms of treatment resistance and relapse.

Through innovative science and patient-centered care, Mayo Clinic is reshaping the future of hematologic malignancies and setting new standards.

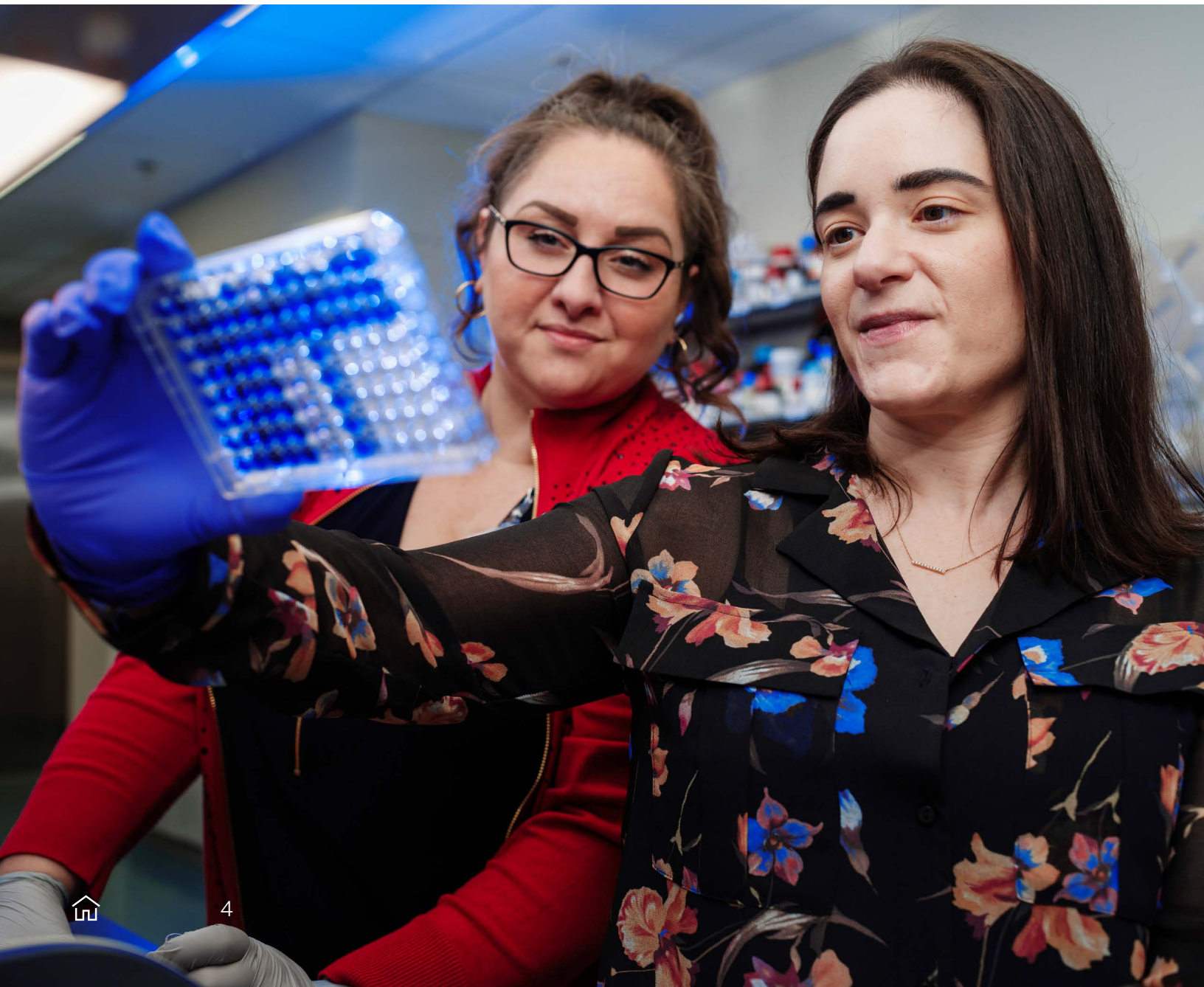
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**clinical trials open to enrollment in
2025 for hematologic malignancies**

LEUKEMIA

Mayo Clinic is a leader in leukemia care and research, **treating 4,700 patients each year** living with acute and chronic forms of leukemia as well as precursor conditions.

Multidisciplinary teams use molecular and genetic profiling to support risk stratification and inform treatment decisions for bone marrow transplantation, bispecific and cellular therapies, as well as novel approaches under investigation in a robust portfolio of clinical trials. Leveraging expansive datasets and advanced AI models, Mayo Clinic's research drives the creation of targeted and immune-based therapies, rapidly bringing discoveries to improve survival and quality of life for patients.





OUR **ACHIEVEMENTS**

Smarter Care for Chronic Lymphocytic Leukemia

Mayo Clinic's cutting-edge, AI-powered prediction models and advanced biomarker tools are revolutionizing care for people with chronic lymphocytic leukemia (CLL). The enhanced risk prediction and treatment guidance are especially important in cases when disease has become resistant to the latest targeted therapies or progresses to Richter syndrome, an aggressive form of lymphoma.

Mayo Clinic investigators applied AI models, genomic sequencing and advanced bioinformatics to show how CLL changes over time and why resistance develops. Their discoveries uncovered key genetic and immune-escape pathways in the hardest-to-treat forms of CLL. These insights are rapidly moving into early clinical trials, including new targeted therapies and next-generation chimeric antigen receptor-T cell therapy (CAR-T cell therapy).

These advanced approaches empower clinicians to pinpoint patient-specific risks, tailor treatment strategies and adapt more quickly to changes in disease progression.

Precisely Defining Disease in Acute Myeloid Leukemia

Mayo Clinic research is helping patients and families with myeloid cancers move from uncertainty to clearer answers and better care.

Acute myeloid leukemia and precursor conditions can sometimes be linked to genetic changes, yet many people never know they carry these risks, especially those with DDX41 mutations, one of the most common inherited factors in adult-onset blood cancers. Mayo Clinic is closing this gap by creating better ways to understand which DDX41 mutations truly raise cancer risk. Through genetic testing, long-term patient monitoring and AI modeling, the research team is identifying harmful mutations, providing guidance for at-risk individuals who will need early intervention.

In addition to assessing risk, Mayo Clinic is making it easier to monitor patients after treatment. Investigators introduced a highly sensitive test that can detect tiny traces of leukemia, helping clinicians know whether a patient is in remission or if the cancer might be coming back.

WHAT'S NEXT

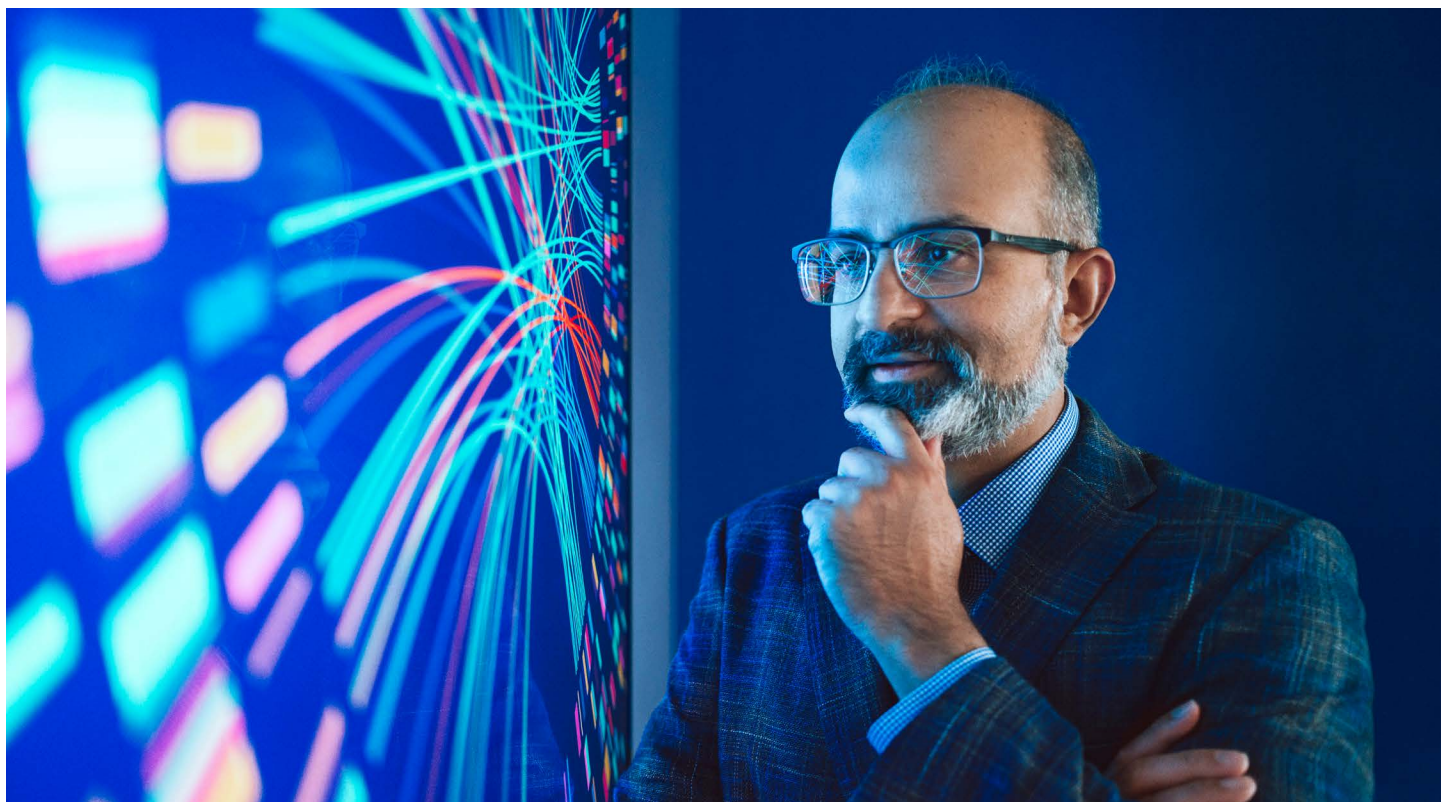
Protecting Patients From Treatment Risks

Mayo Clinic research is helping patients stay safer during cancer treatment by uncovering why certain therapies can increase the risk of developing treatment-related leukemias years later.

Some patients develop early, hidden changes in their blood-forming stem cells, called clonal hematopoiesis, that can expand under the stress of cancer therapy. One widely used treatment, lutetium-177, may push these at-risk cells to grow faster, but until now, clinicians could not easily identify which patients were vulnerable.

Mayo Clinic researchers are studying how this radiopharmaceutical affects blood stem cells in real time. By tracking patients, collecting blood samples before and after treatment, and watching for early warning signs, the team is building tools to spot leukemia risk long before disease develops. Their goal is proactive monitoring, safer therapy planning, and greater peace of mind for patients and families.





CATCHING LEUKEMIA **EARLIER THAN EVER**

“

We're creating tools that can identify precancer decades before it would traditionally be diagnosed.

This gives us a crucial window to intervene.”

— Mrinal S. Patnaik, M.B.B.S.

Mayo Clinic's AI-driven software leverages advanced DNA sequencing data to identify clonal hematopoiesis of indeterminate potential (CHIP), a precancerous stage of acute myeloid leukemia, and transform these findings into actionable guidance for patient care.

Read more about CHIP and Mayo Clinic's Precure initiative.

[Read more](#)

LYMPHOMA

Mayo Clinic stands at the forefront of lymphoma care and research, covering indolent and aggressive B-cell and T-cell lymphomas, Hodgkin lymphoma, and even rare diseases. **Every year, 9,700 individuals entrust their care to Mayo Clinic.**

Multidisciplinary specialists offer cutting-edge diagnostics, image-guided assessments, and therapy platforms including BTK inhibitors and CAR-T cell therapy. Longitudinal biobanks and data science help investigators track changes in disease development, treatment responses and genetic influences over time. Research focuses on next-generation targeted drugs, antibody-drug conjugates and immune-based treatment combinations. Seamless collaboration between clinicians and scientists translates breakthroughs into life-changing care with speed and precision.





OUR **ACHIEVEMENTS**

AI Insights for Lymphoma Care

Mayo Clinic created an AI model to help physicians identify patients needing preventive care after CAR-T cell therapy. Some patients face higher risks in the first six months after receiving treatment, and clinicians have limited tools to spot those risks early. This uncertainty can make it hard for patients and their care teams to plan follow-up care, manage symptoms and intervene when it matters most.

Mayo Clinic researchers analyzed data from hundreds of patients with lymphoma and myeloma to build a machine learning model that predicts who may need closer support in the months following CAR-T cell therapy. Using routine information including vital signs, lab results, heart function tests and imaging, the team created a highly accurate tool. The AI model will enable earlier intervention, tailored care and better outcomes for patients.

Easier Treatment of Follicular Lymphoma

Mayo Clinic is developing a simpler, effective treatment for a slow-growing non-Hodgkin lymphoma, offering patients a therapy that integrates seamlessly into their everyday routines. Patients with low tumor burden follicular lymphoma often do not need heavy treatment right away. But they still need a safe option that controls the disease without long hospital stays or difficult side effects.

Mayo Clinic researchers, working with national partners, evaluated subcutaneous mosunetuzumab, a bispecific antibody designed to be given safely in outpatient clinics. In a phase 2 multicenter clinical trial conducted at community sites across the nation, most patients had strong and lasting responses, and many saw their lymphoma go quiet within a few months. Side effects were mostly mild, and patients did not need to be hospitalized to receive treatment. The positive results warrant larger studies to confirm the treatment's benefits in a broader group of patients.



WHAT'S **NEXT**

Locating Signals in Waldenstrom Macroglobulinemia

Mayo Clinic's research created a genomic map of the evolution of a rare, slow-growing non-Hodgkin lymphoma, which will guide more personalized monitoring and treatment strategies in the future.

Waldenstrom macroglobulinemia can behave very differently from one person to the next. Some patients remain stable for years, while others develop more aggressive disease. A challenge has been understanding what signals might warn clinicians that the cancer is becoming harder to treat.

Mayo Clinic researchers analyzed genetic changes in Waldenstrom macroglobulinemia

cells across all stages of the disease, including the precursor condition, active disease, remission and relapse. They found that as the cancer progresses, it accumulates new mutations, including changes linked to faster-growing lymphomas. Certain genetic alterations, such as those affecting plasma cell identity formation and DNA damage repair, were much more common in relapsed disease.

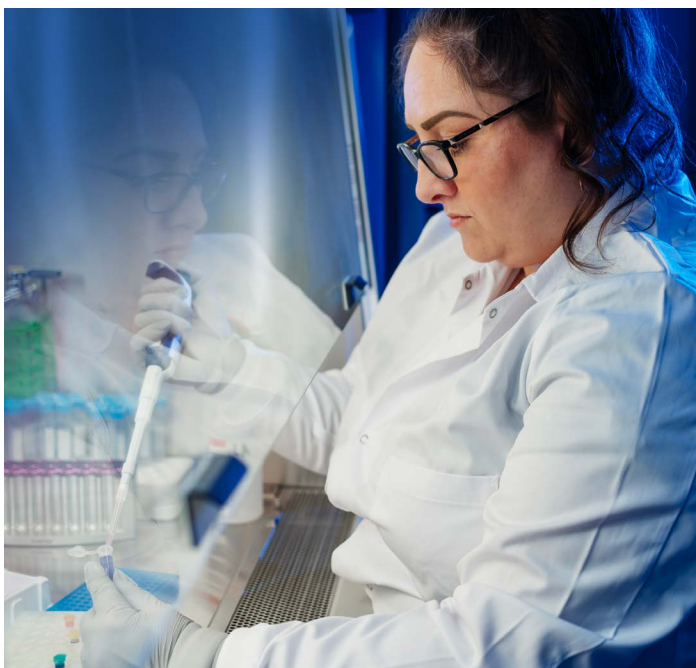
Researchers will follow up on key genes and pathways that could become new biomarkers or treatment targets.

MYELOMA

With the world's largest team of myeloma-focused clinicians and researchers at a single institution, Mayo Clinic drives innovative research and **delivers new treatment options for 7,100 patients each year.**

Multidisciplinary teams apply advanced genomic and cytogenetic testing to personalize treatment plans. The research pipeline encompasses early-phase drug discovery through late-stage clinical trials, featuring combinations of proteasome inhibitors, immunomodulatory drugs, monoclonal antibodies, bispecific antibodies and cellular therapies. By combining science with patient care, Mayo Clinic quickly turns new discoveries into improved outcomes and renewed hope for people affected by myeloma, precursor conditions and other plasma cell disorders.





OUR **ACHIEVEMENTS**

Restoring the Liver in Amyloidosis

Mayo Clinic research is helping guide therapy selection in a rare disorder related to myeloma. In light-chain amyloidosis, faulty plasma cells pump out toxic proteins that form clumps in vital organs like the liver. The amyloid buildup causes severe liver damage, but even after killing bad plasma cells, the liver often stays damaged, leaving some patients weak and at risk of organ failure.

Researchers analyzed more than two decades of patient data at Mayo Clinic from 130 cases of light-chain amyloidosis with confirmed liver involvement. Their work identified factors, such as starting enzyme levels and deep blood responses, that reliably predict liver recovery and shows why some patients' livers recover after treatment while others do not.

These clues empower care teams to design personalized treatment strategies, ensuring that each patient receives care tailored to their unique genetic makeup and disease progression.

Targeting Multiple Myeloma Defenses

Many patients with multiple myeloma experience relapse after treatments like CAR-T cell therapy. Mayo Clinic created predictive models to identify those patients most at risk of relapse and engineer better therapies.

Mayo Clinic researchers found more cancer-associated fibroblasts and tumor-associated macrophages in disease that relapses. The research team's predictive models connected cell patterns with patient outcomes. The cells create a shield that weakens the immune system's ability to fight the cancer.

The team is now focused on developing advanced CAR-T cell therapies to target both multiple myeloma and the supportive cells. Early studies show the new approaches are boosting immune activity, overcoming resistance and helping patients stay in remission longer.

WHAT'S NEXT

Treatments for Transplant-Ineligible Patients

Researchers at Mayo Clinic are improving treatment options for patients with multiple myeloma who are too weak or have other health issues that make bone marrow transplants unsuitable.

The research team monitored patients with multiple myeloma who were treated with targeted therapies built around the immune-boosting drug daratumumab. It sticks to a specific protein on myeloma cells, flagging them so the body's immune fighters can find and destroy the cancer. The drug also spares healthy cells better than traditional treatments.

Mayo Clinic's data shows daratumumab-based four-drug combinations could serve as foundational therapy across a wide range of patient ages, frailty levels

and disease risks. The targeted action and customized combination approach leads to deeper remissions and strong results even in tough cases or frail patients.

Mayo Clinic is exploring different drug options involving daratumumab, along with integrating bispecific therapies or CAR-T cell therapy into treatment plans. These strategies aim to personalize care for patients who cannot undergo a bone marrow transplant and help prevent their cancer from returning as quickly.



Philanthropic support empowers
Mayo Clinic hematologic malignancies
researchers and physicians, **impacting
people around the world.**

ON BEHALF OF PATIENTS
EVERYWHERE, **THANK YOU.**





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