Bone marrow transplants

Pioneering work by Dr. E. Donnell Thomas and his colleagues at Fred Hutch made bone marrow transplantation a curative therapy for patients with certain blood cancers. Over the years, their unique approach to refining the procedure and steadily building on discoveries has rippled into many other spheres of treatment — and continues to drive new ideas that could translate into therapies for many more patients in need.

Supportive care

Methods developed to support transplant patients through the difficult procedure — like food safety guidelines for immunocompromised patients and the Hickman line, an extended-use catheter developed at the Hutch to deliver IV nutrition or chemotherapy and draw blood samples without requiring patients to undergo hundreds of individual needle sticks — have helped shape the standard of care for patients undergoing many other forms of treatment beyond transplantation.

Cord blood transplants

Using stem cells from donated umbilical cords, which don’t need to be as stringently matched to the recipient as adult stem cells, cord blood transplantation broadens options for the thousands of cancer patients every year who can’t find a matched adult donor.

Mini-transplants

Developed at Fred Hutch, these gentler versions of bone marrow transplantation brought the procedure’s curative power to an older population not previously eligible for the more toxic preparations of the traditional transplant.

THE BMT UNIVERSE

Infectious disease

Because transplantation destroys much of their immune systems, patients are especially susceptible to infections, many of which can be dangerous or even deadly. In an effort to improve transplant safety, Hutch teams have made seminal contributions to understanding how to detect, prevent and treat many of the viruses and fungi that can cause disease — work that also kicked off research that has impacted care for other immunocompromised people, including organ transplant recipients and patients with HIV.

Gene therapy

What researchers have learned about both transplantation and stem cells has broadened the possibilities for modern gene therapy. Researchers at the Hutch and elsewhere are developing cutting-edge gene therapies that aim to reach directly into patients’ genomes and correct disease-causing mutations or snip out hidden viral DNA, thus curing genetic or viral diseases such as HIV, sickle cell disease, thalassemia, severe combined immunodeficiency (SCID) and Fanconi anemia.

Immunotherapy

This collection of techniques developed at the Hutch and at many other research centers around the world harnesses and boosts the body’s own ability to eliminate cancer cells and is based on Thomas’ original observations of the immune system’s power to fight cancer. Whether through immune molecules known as antibodies that can precisely recognize tumors, killer immune cells known as T cells engineered or selected for their ability to home directly to and destroy cancer cells, or vaccines that can trigger the patient’s immune system to prevent or treat cancer, immunotherapeutic approaches are already being used to treat certain cancers. And many more techniques currently being tested are poised to change how we treat — and cure — nearly all cancers.

Broadening transplantation’s reach

Today, blood stem cell transplants are used for numerous forms of leukemia and lymphoma as well as dozens of other diseases, including myelodysplastic syndromes (MDS), multiple myeloma, Wiskott-Aldrich syndrome, anemias and more, as well as for children with blood cancers. Researchers are also testing transplantation to treat autoimmune disorders such as Crohn’s disease.

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