History of Cell Therapy

1891

First example of early immunotherapy to treat cancer

–

Developed by Dr. William B. Coley by injecting streptococcal organisms into a patient with inoperable bone cancer.[1]

1960s

Researchers discover that cancer cells express specific markers

–

These markers can be recognized and eliminated by the host, as shown by Eva and George Klein through mouse models.[2]

1983-84

First immunotherapy-mediated tumor regression in humans

–

Dr. Steven Rosenberg and team develop an early form of immunotherapy where patients receive an infusion of interleukin-2 (IL-2). One patient with advanced metastatic melanoma survives because of the treatment.[3]

1985

Early cell therapy data published[4]

–

Resulting in a Newsweek cover story.[3]

1987

First publication on chimeric receptors and effect on T cell activity[5]

1989

Chimeric antigen receptors first developed

–

Zelig Eshhar develops the first double chain chimeric antigen receptor (CAR).[6]

1997

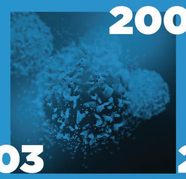
First CAR T clinical trials in patients with solid tumors (colon cancer) begin[7]

2003

Research on mouse models shows that T cells engineered with an anti-CD19 CAR can eradicate leukemia cells[8]

2007

First T cell receptor (TCR) engineered T cell therapy clinical trial enrolls for the treatment of solid tumors (metastatic melanoma)[9]



2009

First B-cell lymphoma patients treated with CAR T[10]

2010

First chronic lymphoid leukemia (CLL) patients treated with CAR T

–

Dr. Carl June and team treat the first patients with advanced CLL using one single infusion of CD19 CAR T cells.[11,12]

2012

First pediatric patient is treated with CAR T

–

A six year-old with acute lymphoblastic leukemia (ALL) is the first pediatric patient to be treated with CD19 CAR T therapy.[13]

2017

First CAR T therapies approved by the FDA

–

Two anti-CD19 CAR T therapies approved by the FDA for the treatment of ALL and/or types of large B-cell lymphomas.[14,15]

2017

Results from studies of two CAR T therapies in patients with relapsed or refractory large B-cell lymphoma published[16,17]

2018

Dr. Carl June recognized in TIME's 100 most influential people for his pioneering work in CAR T therapy[18]

2018

First CAR T therapies approved in Europe[19,20]

2018-2020

CAR T therapies approved in other countries worldwide[21,22,23,24,25]

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