Chimäre Antigenrezeptor-exprimierende T-Zellen für die Krebsimmuntherapie

1. Jewett, A. and H.C. Tseng, Tumor induced inactivation of natural killer cell cytotoxic function; implication in growth, expansion and differentiation of cancer stem cells. J Cancer, 2011. 2: p. 443-57.
2. Pulsipher, M.A., et al., The addition of sirolimus to tacrolimus/methotrexate GVHD prophylaxis in children with ALL: a phase 3 Children's Oncology Group/Pediatric Blood and Marrow Transplant Consortium trial. Blood, 2014. 123 (13): p. 2017-25.
3. Knochelmann, H.M., et al., CAR T Cells in Solid Tumors: Blueprints for Building Effective Therapies. Front Immunol, 2018. 9: p. 1740.
4. Sadelain, M., R. Brentjens, and I. Riviere, The basic principles of chimeric antigen receptor design. Cancer Discov, 2013. 3 (4): p. 388-98.
5. Gross, G., T. Waks, and Z. Eshhar, Expression of immunoglobulin-T-cell receptor chimeric mole-cules as functional receptors with antibody-type specificity. Proc Natl Acad Sci U S A, 1989. 86 (24): p. 10024-8.
6. Irving, B.A. and A. Weiss, The cytoplasmic domain of the T cell receptor zeta chain is sufficient to couple to receptor-associated signal transduction pathways. Cell, 1991. 64 (5): p. 891-901.
7. Brocker, T. and K. Karjalainen, Signals through T cell receptor-zeta chain alone are insufficient to prime resting T lymphocytes. J Exp Med, 1995. 181 (5): p. 1653-9.
8. Chmielewski, M., A.A. Hombach, and H. Abken, Antigen-Specific T-Cell Activation Independently of the MHC: Chimeric Antigen Receptor-Redirected T Cells. Front Immunol, 2013. 4: p. 371.
9. Finney, H.M., et al., Chimeric receptors providing both primary and costimulatory signaling in T cells from a single gene product. J Immunol, 1998. 161 (6): p. 2791-7.
10. Hombach, A., et al., Tumor-specific T cell activation by recombinant immunoreceptors: CD3 zeta signaling and CD28 costimulation are simultaneously required for efficient IL-2 secretion and can be integrated into one combined CD28/CD3 zeta signaling receptor molecule. J Immunol, 2001. 167 (11): p. 6123-31.
11. Thistlethwaite, F., et al., Engineering T-cells with antibody-based chimeric receptors for effective cancer therapy. Curr Opin Mol Ther, 2005. 7 (1): p. 48-55.
12. Hombach, A. and H. Abken, Costimulation tunes tumor-specific activation of redirected T cells in adoptive immunotherapy. Cancer Immunol Immunother, 2007. 56 (5): p. 731-7.
13. Kloss, C.C., et al., Dominant-Negative TGF-beta Receptor Enhances PSMA-Targeted Human CAR T Cell Proliferation And Augments Prostate Cancer Eradication. Mol Ther, 2018. 26 (7): p. 1855-1866.
14. Craddock, J.A., et al., Enhanced tumor trafficking of GD2 chimeric antigen receptor T cells by ex-pression of the chemokine receptor CCR2b. J Immunother, 2010. 33 (8): p. 780-8.
15. Moon, E.K., et al., Expression of a functional CCR2 receptor enhances tumor localization and tumor eradication by retargeted human T cells expressing a mesothelin-specific chimeric antibody receptor. Clin Cancer Res, 2011. 17 (14): p. 4719-30.
16. Chmielewski, M. and H. Abken, CAR T Cells Releasing IL-18 Convert to T-Bet(high) FoxO1(low) Effectors that Exhibit Augmented Activity against Advanced Solid Tumors. Cell Rep, 2017. 21 (11): p. 3205-3219.
17. Yakoub-Agha, I., et al., Management of adults and children undergoing CAR t-cell therapy: best practice recommendations of the European Society for Blood and Marrow Transplantation (EBMT) and the Joint Accreditation Committee of ISCT and EBMT (JACIE). Haematologica, 2019.
18. Kershaw, M.H., et al., A phase I study on adoptive immunotherapy using gene-modified T cells for ovarian cancer. Clin Cancer Res, 2006. 12 (20 Pt 1): p. 6106-15.
19. Lamers, C.H., et al., Treatment of metastatic renal cell carcinoma with autologous T-lymphocytes genetically retargeted against carbonic anhydrase IX: first clinical experience. J Clin Oncol, 2006. 24 (13): p. e20-2.
20. Brentjens, R.J., et al., Safety and persistence of adoptively transferred autologous CD19-targeted T cells in patients with relapsed or chemotherapy refractory B-cell leukemias. Blood, 2011. 118 (18): p. 4817-28.
21. Porter, D.L., et al., Chimeric antigen receptor-modified T cells in chronic lymphoid leukemia. N Engl J Med, 2011. 365 (8): p. 725-33.
22. Kochenderfer, J.N., et al., B-cell depletion and remissions of malignancy along with cytokine-associated toxicity in a clinical trial of anti-CD19 chimeric-antigen-receptor-transduced T cells. Blood, 2012. 119 (12): p. 2709-20.
23. Kalos, M., et al., T cells with chimeric antigen receptors have potent antitumor effects and can establish memory in patients with advanced leukemia. Sci Transl Med, 2011. 3 (95): p. 95ra73.

24. Mohty, M., et al., CD19 chimeric antigen receptor-T cells in B-cell leukemia and lymphoma: current status and perspectives. Leukemia, 2019. 33 (12): p. 2767-2778.

25. Turtle, C.J., et al., CD19 CAR-T cells of defined CD4+:CD8+ composition in adult B cell ALL patients. J Clin Invest, 2016. 126 (6): p. 2123-38.

26. Maude, S.L., et al., Chimeric antigen receptor T cells for sustained remissions in leukemia. N Engl J Med, 2014. 371 (16): p. 1507-17.

27. Grupp, S.A., et al., Chimeric antigen receptor-modified T cells for acute lymphoid leukemia. N Engl J Med, 2013. 368 (16): p. 1509-1518.

28. Lee, D.W., et al., T cells expressing CD19 chimeric antigen receptors for acute lymphoblastic leukaemia in children and young adults: a phase 1 dose-escalation trial. Lancet, 2015. 385 (9967): p. 517-528.

29. Brentjens, R.J., et al., CD19-targeted T cells rapidly induce molecular remissions in adults with chemotherapy-refractory acute lymphoblastic leukemia. Sci Transl Med, 2013. 5(177): p. 177ra38.

30. Davila, M.L. and M. Sadelain, Biology and clinical application of CAR T cells for B cell malignancies. Int J Hematol, 2016. 104 (1): p. 6-17.

31. Schuster SJ, et al., Sustained Remissions Following Chimeric Antigen Receptor Modified T Cells Directed Against CD19 (CTL019) in Patients with Relapsed or Refractory CD19+ Lymphomas. Blood, 2015. 126: p. 183.

32. Kochenderfer, J.N., et al., Chemotherapy-refractory diffuse large B-cell lymphoma and indolent B-cell malignancies can be effectively treated with autologous T cells expressing an anti-CD19 chimeric antigen receptor. J Clin Oncol, 2015. 33 (6): p. 540-9.

33. Turtle CJ, et al., Anti-CD19 chimeric antigen receptor-modified T cell therapy for B cell non-hodgkin lymphoma and chronic-lymphocytic leukemia: Fludarabine and cyclophosphamide lymphodepletion improves in vivo expansion and persistence of CAR-T cells and clinical outcomes. Blood, 2015. 126: p. 184.

34. Porter, D.L., et al., Chimeric antigen receptor T cells persist and induce sustained remissions in re-lapsed refractory chronic lymphocytic leukemia. Sci Transl Med, 2015. 7 (303): p. 303ra139.

35. Locke, F.L., et al., Long-term safety and activity of axicabtagene ciloleucel in refractory large B-cell lymphoma (ZUMA-1): a single-arm, multicentre, phase 1-2 trial. Lancet Oncol, 2019. 20(1): p. 31-42.

36. Crump, M., et al., Outcomes in refractory diffuse large B-cell lymphoma: results from the inter-national SCHOLAR-1 study. Blood, 2017. 130 (16): p. 1800-1808.

37. Chavez, J.C., C. Bachmeier, and M.A. Kharfan-Dabaja, CAR T-cell therapy for B-cell lymphomas: clinical trial results of available products. Ther Adv Hematol, 2019. 10: p. 2040620719841581.

38. Schuster, S., et al., Sustained Disease Control for Adult Patients with Relapsed or Refractory Diffuse Large B-Cell Lymphoma: An Updated Analysis of Juliet, a Global Pivotal Phase 2 Trial of Tisagenlecleucel. Blood, 2018. 132: p. 1684.

39. Abramson, J., L. Gordon, and M. Palomba, Updated safety and long term clinical outcomes in TRANSCEND NHL 001 pivotal trial of lisocabtagene maraleucel (JCAR017) in R/R aggressive NHL. J Clin Oncol, 2018.

40. Abramson, J., et al., Safety and Efficacy Results from Transcend NHL001, a Multicenter Phase 1 Study of Lisoctabtagene Maraleucel (liso-cel) in Relapsed/Refractory (R/R) Large B Cell Lymphomas. ASH, 2019. Abstract 241.

41. Winkler, U., et al., Cytokine-release syndrome in patients with B-cell chronic lymphocytic leukemia and high lymphocyte counts after treatment with an anti-CD20 monoclonal antibody (rituximab, IDEC-C2B8). Blood, 1999. 94 (7): p. 2217-24.

42. Maude, S.L., et al., Managing cytokine release syndrome associated with novel T cell-engaging therapies. Cancer J, 2014. 20 (2): p. 119-22.

43. Davila, M.L., et al., Efficacy and toxicity management of 19-28z CAR T cell therapy in B cell acute lymphoblastic leukemia. Sci Transl Med, 2014. 6 (224): p. 224ra25.

44. Giavridis, T., et al., CAR T cell-induced cytokine release syndrome is mediated by macrophages and abated by IL-1 blockade. Nat Med, 2018. 24 (6): p. 731-738.

45. Norelli, M., et al., Monocyte-derived IL-1 and IL-6 are differentially required for cytokine-release syndrome and neurotoxicity due to CAR T cells. Nat Med, 2018. 24 (6): p. 739-748.

46. Lee, D.W., et al., Current concepts in the diagnosis and management of cytokine release syn-drome. Blood, 2014. 124 (2): p. 188-95.

47. Brudno, J.N. and J.N. Kochenderfer, Toxicities of chimeric antigen receptor T cells: recognition and management. Blood, 2016. 127 (26): p. 3321-30.

48. Morgan, R.A., et al., Case report of a serious adverse event following the administration of T cells transduced with a chimeric antigen receptor recognizing ERBB2. Mol Ther, 2010. 18(4): p. 843-51.

49. Brentjens, R., et al., Treatment of chronic lymphocytic leukemia with genetically targeted autologous T cells: case report of an unforeseen adverse event in a phase I clinical trial. Mol Ther, 2010. 18(4): p. 666-8.

50. Schuster, S.J., et al., Tisagenlecleucel in Adult Relapsed or Refractory Diffuse Large B-Cell Lymphoma. N Engl J Med, 2019. 380(1): p. 45-56.

51. Novartis, Kymriah Product Information. 2018.

52. Kohl, U., et al., CAR T Cells in Trials: Recent Achievements and Challenges that Remain in the Production of Modified T Cells for Clinical Applications. Hum Gene Ther, 2018. 29(5): p. 559-568.

53. Mehta, R.S. and K. Rezvani, Chimeric Antigen Receptor Expressing Natural Killer Cells for the Immunotherapy of Cancer. Front Immunol, 2018. 9: p. 283.

54. Ruella, M. and M.V. Maus, Catch me if you can: Leukemia Escape after CD19-Directed T Cell Immunotherapies. Comput Struct Biotechnol J, 2016. 14: p. 357-362.

55. Majzner, R.G. and C.L. Mackall, Tumor Antigen Escape from CAR T-cell Therapy. Cancer Discov, 2018. 8(10): p. 1219-1226.

56. Shah, N.N., et al., Multi Targeted CAR-T Cell Therapies for B-Cell Malignancies. Front Oncol, 2019. 9: p. 146.

57. Shah, N., et al., Initial Results from a Phase 1 Clinical Study of bb21217, a Next-Generation anti BCMA CAR T Therapy. Blood, 2018. 132 (Supplement 1): 488.

58. Eyquem, J., et al., Targeting a CAR to the TRAC locus with CRISPR/Cas9 enhances tumour re-jection. Nature, 2017. 543(7643): p. 113-117.

59. Suck, G., et al., NK-92: an 'off-the-shelf therapeutic' for adoptive natural killer cell-based cancer immunotherapy. Cancer Immunol Immunother, 2016. 65(4): p. 485-92.