NKG2A/HLA-E, or inhibitory KIR; (b) one or more of atezolizumab, avelumab, durvalumab, ipilimumab, IPH4102, IPH43, IPH33, lirimumab, monalizumab, nivolumab, pembrolizumab, and their derivatives or functional equivalents; (c) at least one of atezolizumab, nivolumab, and pembrolizumab; or (ii) the therapeutic agents comprise one or more of venetoclax, azacitidine, and pomalidomide. In some embodiments where the therapeutic agent is an antibody, the antibody comprises: (a) an anti-CD20 antibody, an anti-HER2 antibody, an anti-CD52 antibody, an anti-EGFR antibody, an anti-CD123 antibody, an anti-GD2 antibody, or an anti-PDL1 antibody; or (b) one or more of rituximab, veltuzumab, ofatumumab, ublituximab, ocaratuzumab, obinutuzumab, trastuzumab, pertuzumab, alemtuzumab, cetuximab, dinutuximab, avelumab, daclizumab, basiliximab, M-A251, 2A3, BC69, 24204, 22722, 24212, MAB23591, FN50, 298614, AF2359, CY1G4, DF1513, bivatuzumab, RG7356, G44-26, 7G3, CSL362, elotuzumab, and their humanized or Fc modified variants or fragments and their functional equivalents and biosimilars thereof. In some embodiments where the therapeutic agent is an engager, the engager comprises: (i) a bispecific T cell engager (BiTE); (ii) a bispecific killer cell engager (BiKE); or (iii) a tri-specific killer cell engager (TriKE); or the engager comprises: (a) a first binding domain recognizing an extracellular portion of CD3, CD5, CD16, CD28, CD32, CD33, CD64, CD89, NKG2C, NKG2D, or any functional variants thereof of the cell or a by-stander immune effector cell; and (b) a second binding domain specific to an antigen comprising any one of: B7H3, BCMA, CD10, CD19, CD20, CD22, CD24, CD30, CD33, CD34, CD38, CD44, CD52, CD79a, CD79b, CD123, CD138, CD179b, CEA, CLEC12A, CS-1, DLL3, EGFR, EGFRvIII, EpCAM, FLT-3, FOLR1, FOLR3, GD2, gpA33, HER2, HM1.24, LGR5, MSLN, MCSP, MICA/B, Muc1, Muc16, PDL1, PSMA, PAMA, P-cadherin, ROR1, or VEGF-R2.

[0027] In another aspect, the present invention provides a method of treating a subject in need of an adoptive cell therapy, wherein the method comprises infusing the subject with effector cells, wherein the effector cells comprise the derivative cell or population thereof provided herein in combination with an exogenous cytokine.

[0027a] In another aspect, provided herein is use of the composition as described herein in the manufacture of a medicament to be introduced to a subject in need of an adoptive cell therapy, wherein the subject has an autoimmune disorder, a hematological malignancy, a solid tumor, cancer, or a virus infection.

[0027b] In another aspect, provided herein is use of effector cells comprising the derivative cell or population thereof as described herein in the manufacture of a medicament for improving efficacy of an adoptive cell therapy provided to a subject in need thereof, wherein the effector cells are to be administered to the subject.

[0027c] In another aspect, provided herein is use of effector cells comprising the derivative cell or population thereof according to any one of claims 1-20 in combination with an exogenous cytokine in the manufacture of a medicament for treating a subject in need of an adoptive cell therapy, wherein the effector cells are to be infused into the subject.

[0027d] In another aspect, provided herein is the composition as described herein or effector cells comprising the derivative cell or population thereof as described herein alone or in combination with an exogenous cytokine for use in therapy.

[0028] Various objects and advantages of the compositions and methods as provided herein will become apparent from the following description taken in conjunction with the accompanying drawings wherein are set forth, by way of illustration and example, certain embodiments of this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] FIGS. 1A-1D show that iPSC-derived CAR T cells can be transduced with Fas redirection constructs and expand in a scalable manufacturing process.