Supplementary Figure 1: DCP-001 induced T cell responses against NY-ESO-1 in bone marrow. Pre-(t=0) and post-vaccination (t=126) T cell responses after in vitro restimulation in an IFNy elispot read-out against NY-ESO-1 overlapping 15-mer peptides in bone marrow samples of patient 004.
Supplementary Figure 2: Pre- and post-vaccination IFNγ ELISPOT reactivity. Shown are ELISPOT reactivities after in vitro stimulation (in number of antigen-specific T cells per 100,000, i.e. with vehicle background frequencies subtracted) for all ELISPOT responses determined to be positive post-vaccination to the indicated tumor antigens. Definition of positive response: significantly higher than background controls in unpaired Student’s T test, exceeding background at least 2-fold and with a minimum of 5 spots difference. The legend lists the corresponding patient numbers.
Supplementary Figure 3: Immune infiltrate analysis of pre- and post-vaccination delayed-type hypersensitivity (DTH) skin sites. Intradermal injections were administered of cryostor vehicle or DCP-001 cells at t=0 (pre-vaccination) and t=49 (post-vaccination). Two days later (t=2 and t=51) induration was measured and punch biopsies were taken from the DTH sites of the patients listed at the top (patients 001, 002, 004, 006, 007, 008, 012, 013, and 014). A) Immunohistochemical analysis (semi-quantitatively scored from – to ++++) was performed for the markers indicated at the left. Relative expression levels in the superficial and deep dermis are indicated by intensity of the color red; grey=not done (ND). B) Grouped pre- and post-vaccination levels of infiltrating CD4+ and CD8+ T cells and CD45RO+ cells in the superficial dermis.
Supplementary Figure 4: Serological response induced upon 2 DCP-001 booster vaccinations. De novo induced antibody responses after two additional booster vaccinations with DCP-001 against lysates from DCOne progenitors (P) and autologous leukemic blasts (B) are indicated by arrows. Pre- (t=0) and post-booster (t=133) sera from patient 001 were used.
Supplementary Fig. 5 T cell cytokine responses to DCP-001 over the course of treatment. In vitro cytokine release by peripheral blood lymphocytes in response to DCP-001. Shown are results from patients with post-vaccination increased responses (significant increase from baseline; only positive responses shown).
**Supplementary Table I. Prior (1\textsuperscript{st} and 2\textsuperscript{nd} line) therapy and cytogenetics of the enrolled patients**

| Patient ID | Lines of therapy prior to vaccination | Cytogenetics (most complex shown) |
|------------|--------------------------------------|----------------------------------|
| 001        | cytarabin, clofarab, amsacrine, idarubicin, vidaza | 46, XX [20] |
| 002        | daunomycin, cytarabin, tosedostat | 46, XYt(1;3)(p36;q21)del(5)(q31,q33)[14] |
| 004        | daunomycin, cytarabin, bevacizumab, vidaza | 46, XX [20] |
| 005        | daunomycin, cytarabin, aurorokinase inhibitor (AZD 1152) | nd |
| 006        | daunomycin, cytarabin, vidaza | 46, XX t(2,2)(p21;p25)[4] /46 idem +1 der(1;21)(q10;q10) |
| 007        | daunomycin, cytarabine, lenalidomide | 46, XX [20] |
| 008        | Idarubicin, ARA-c | 46, XX [20] |
| 011        | Idarubicin, ARA-c, clofarabine AMSA | 46, XX [4] |
| 012        | daunorubicine + cytarabine, vidaza | 48, XY +21, +21 [9] /46,XY [11] |
| 013        | Idarubicin, cytorabine | 45, XY [14] / 46,XY [6] |
| 014        | cytarabine, daunorubicine, Lenalidomide, vidaza | 46, XY der(1;7)(q10;p10) [14] 46,XY [6] |
| 015        | Daunorubicin, cytarabin, lenalidomide | 46,XY [20] |

nd: not done