Supplementary Figure 1. Correlation of infused adoptive NK cell number in millions per kilogram body weight and number of adoptive NK cells per microliter of blood at one (black dots) and three weeks (red dots) after transfer.
**Supplementary Figure 2.** Bayesian generalized linear regression model for validation of primary results displayed in Fig. 3A.
**Supplementary Figure 3** Frequencies of individual NK cell receptors (logarithmic scale) for 46 patients by time point. Time points are abbreviated to reflect course and day (C#D#). Plots are shown for CD158a (A), CD158b (B), CD158e1 (C), NKG2A (D), NKp46 (E), NKp44 (F), NKp30 (G), and NKG2D (H).
**Supplementary Figure 4** Evaluation of CD56^bright^ NK cell count per uL (restricted range, 0-200 cells/uL) by symmetric percent change in tumor volume after two courses of chemo-immunotherapy compared to baseline. Interpolation was performed using spline functions.
| UPN | Age, yrs. | Sex | Bw   | C       | Demographics at diagnosis | Patient HLA status | KIR-HLA mismatch | Donor KIR−recipient HLA mismatch | Peak NK cell chimerism | Adoptive NK cell transfer (10⁶/kg) | Survival status |
|-----|-----------|-----|------|---------|---------------------------|-------------------|-----------------|---------------------------------|----------------------|---------------------------------|----------------|
| 1   | 5.6       | Male | Bw4, Bw6 | C06:02, C07:02 | Absent                   | -                 | 68.0            | 7                              | 55.40                | 0.0230 0.000                   | Alive          |
| 2   | 5.5       | Male | Bw4, Bw6 | C07:01, C16:01 | Absent                   | CD158a            | 0.5             | 21                             | 32.05                | 0.0074 0.000                   | Alive          |
| 3   | 1.8       | Female | Bw4, Bw6 | C05:01, C01:02 | Absent                   | -                 | 41.0            | 7                              | 38.99                | 0.0240 0.000                   | Alive          |
| 4   | 2.7       | Male | Bw4, Bw6 | C03:03, C04:01 | Absent                   | -                 | 36.0            | 7                              | 20.72                | 0.0110 0.002                   | Alive          |
| 5   | 7.1       | Male | Bw4, Bw6 | C17:01, C03:04 | Absent                   | -                 | 3.0             | 7                              | 34.36                | 0.0280 0.000                   | Alive          |
| 6   | 15.2      | Male | Bw4, Bw6 | C05:01, C07:02 | Absent                   | -                 | 0.0             | 7                              | 8.54                 | 0.0040 0.001                   | Deceased       |
| 7   | 2.5       | Female | Bw6, Bw6 | C02:02, C18:01 | Present                  | CD158b, CD158e1   | 0.5             | 7                              | 17.54                | 0.0090 0.000                   | Alive          |
| 8   | 1.7       | Male | Bw6, Bw6 | C06:02, C07:02 | Absent                   | -                 | 51.0            | 7                              | 42.74                | 0.0170 0.000                   | Deceased       |
| 9   | 0.5       | Male | Bw6, Bw6 | C03:03, C07:01 | Present                  | CD158a            | 0.5             | 7                              | 53.36                | 0.0270 0.000                   | Deceased       |
| 10  | 2.8       | Female | Bw4, Bw6 | C07:01, C07:02 | Present                  | CD158a            | -               | 7                              | 24.43                | 0.0130 0.000                   | Deceased       |
| 11  | 2.3       | Male | Bw4, Bw6 | C05:01, C14:02 | Absent                   | -                 | 6.0             | 7                              | 34.93                | 0.0210 0.009                   | Alive          |
| 12  | 1.8       | Male | Bw4, Bw6 | C04:01, C07:01 | Present                  | CD158e1           | 0.0             | 7                              | 9.21                 | 0.0090 0.000                   | Alive          |
| 13  | 5.2       | Male | Bw4, Bw6 | C05:01, C07:04 | Absent                   | -                 | 0.0             | 21                             | 9.38                 | 0.0060 0.000                   | Alive          |
| 14  | 1.9       | Male | Bw4, Bw6 | C16:01, C08:02 | Present                  | CD158a            | 4.0             | 7                              | 42.18                | 0.0440 0.000                   | Alive          |
| 15  | 7.9       | Male | Bw6, Bw6 | C07:02, C12:03 | Present                  | CD158a, CD158e1   | 35.0            | 21                             | 10.16                | 0.0900 0.000                   | Alive          |
| 16  | 6.3       | Female | Bw6, Bw6 | C08:01, C12:03 | Present                  | CD158a            | 1.0             | 21                             | 3.04                 | 0.0040 0.000                   | Alive          |
| 17  | 0.6       | Male | Bw4, Bw6 | C12:03, C07:02 | Present                  | CD158a            | 4.0             | 7                              | 113.97               | 0.1040 0.000                   | Alive          |
| 18  | 5.6       | Male | Bw4, Bw4 | C02:02, C12:02 | Absent                   | -                 | 1.0             | 21                             | 27.60                | 0.0200 0.000                   | Alive          |
| 19  | 1.5       | Male | Bw4, Bw6 | C04:01, C12:02 | Absent                   | -                 | 81.0            | 7                              | 28.67                | 0.0120 0.000                   | Alive          |
| 20  | 4.4       | Male | Bw4, Bw6 | C04:01, C08:02 | Absent                   | -                 | 1.0             | 7                              | 4.14                 | 0.0030 0.000                   | Alive          |
| 21  | 3.3       | Male | Bw4, Bw6 | C07:01, C08:02 | Present                  | CD158a            | 3.0             | 7                              | 17.99                | 0.0050 0.000                   | Alive          |
| 22  | 2.8       | Female | Bw4, Bw6 | C05:01, C07:02 | Absent                   | -                 | -               | -                              | 14.04                | 0.0060 0.000                   | Alive          |
| 23  | 14.4      | Female | Bw6, Bw6 | C04:01, C08:02 | Present                  | CD158e1           | 0.0             | 21                             | 5.34                 | 0.0020 0.000                   | Alive          |
| UPN | Demographics at diagnosis | Patient HLA status | KIR-HLA mismatch | Peak NK cell chimerism | Adoptive NK cell transfer (10⁶/kg) | Survival status |
|-----|--------------------------|-------------------|-----------------|-----------------------|-----------------------------------|----------------|
| 24  | Age, yrs. 2.0 Female     | Bw4, Bw6          | C06:02, C12:02  | Absent                | 27.0 7 24.89 0.0080 0.000         | Alive          |
| 25  | Male 4.1                 | Bw6, Bw6          | C03:04, C07:04  | Present CD158a, CD158e1| 22.0 7 17.42 0.0050 0.000         | Alive          |
| 26  | Male 2.1                 | Bw6, Bw6          | C07:02, C07:72  | Present CD158a, CD158e1| 0.0 21 17.76 0.0110 0.000         | Alive          |
| 27  | Male 3.8                 | Bw4, Bw6          | C01:02, C04:01  | Absent                | 5.9 7 26.02 0.0100 0.000         | Alive          |
| 28  | Female 3.3               | Bw4, Bw6          | C03:04, C07:18  | Present CD158a        | 2.0b 7 32.02 0.0190 0.003         | Alive          |
| 29  | Female 4.0               | Bw6, Bw6          | C04:01, C03:03  | Present CD158e1       | 29.0 21 5.75 0.0020 0.000         | Alive          |
| 30  | Male 2.7                 | Bw6, Bw6          | C03:04, C07:02  | Present CD158a        | 39.0 7 10.50 0.0190 0.013         | Deceased       |
| 31  | Male 14.5                | Bw6, Bw6          | C07:01, C07:02  | Present CD158a, CD158e1| 0.0 7 3.77 0.0020 0.000         | Alive          |

Abbreviation: UPN, unique patient number; yrs, years.

**Supplementary Table 1.** Clinical characteristics of patients who received adoptive transfer of haploidentical NK cells. KIR–HLA receptor–ligand mismatch where at least one KIR does not recognize any of the patient’s HLA molecules.
### Supplementary Table 2.

Median time of treatment cycles from therapy start (C1D1).

|                      | Days from C1D1 |                  | Weeks from C1D1 |                  |
|----------------------|----------------|------------------|------------------|------------------|
|                      | N   | Median | Min | Max | N   | Median | Min | Max |
| Course 02 Induction  | 63  | 22     | 19  | 26  | 63  | 3.1    | 2.7 | 3.7 |
| Course 03 Induction  | 63  | 45     | 37  | 63  | 63  | 6.4    | 5.3 | 9.0 |
| Course 04 Induction  | 62  | 75     | 62  | 93  | 62  | 10.7   | 8.9 | 13.3|
| Course 05 Induction  | 61  | 102    | 85  | 122 | 61  | 14.6   | 12.1| 17.4|
| Course 06 Induction  | 61  | 127    | 111 | 161 | 61  | 18.1   | 15.9| 23.0|
| Intensification Phase| 58  | 167.5  | 138 | 207 | 58  | 23.9   | 19.7| 29.6|
| Autologous transplant| 55* | 174    | 145 | 214 | 55* | 24.9   | 20.7| 30.6|
| Additional MRD Treatment| 42  | 176    | 147 | 214 | 42  | 25.1   | 21.0| 30.6|

*Should be a total of 57, but dates were not entered in the database for 2 patients.