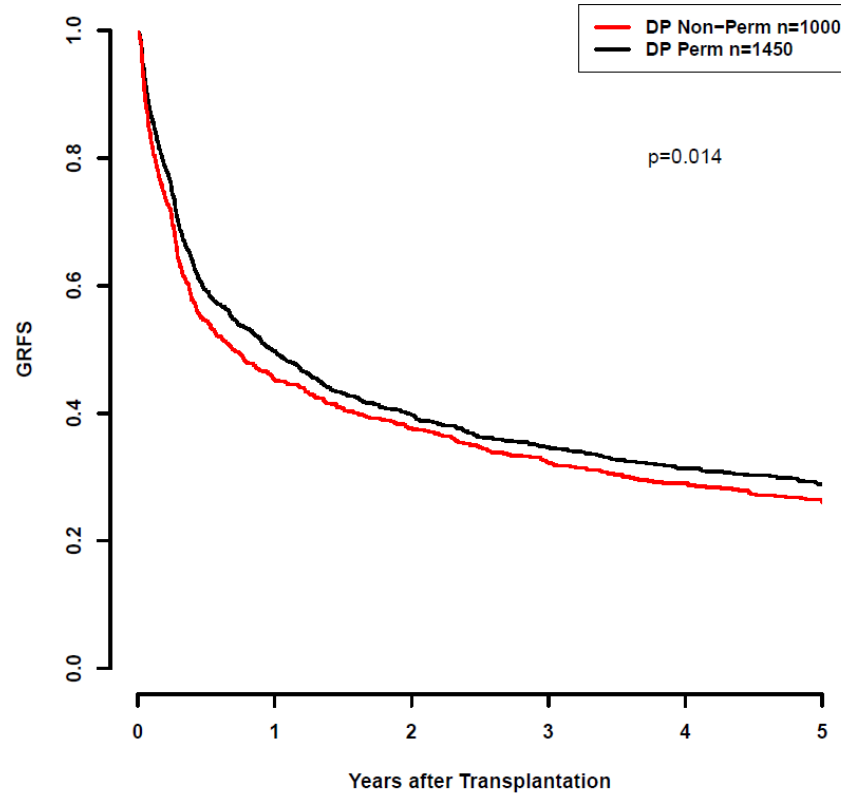


Supplemental Material

Study design, clinical data and ethics:

This study represents a retrospective analysis of the impact of HLA-DPB1 mismatches on the outcome of HSCT. HLA-typing for HLA-A, -B, -C, -DRB1 and -DQB1 was conducted upfront in the context of unrelated donor search, which was performed at the tissue typing laboratory of the search unit Ulm, where all donor searches were conducted. HLA-DPB1 typing was performed retrospectively. Individual treatment decisions were made by the transplanting centers, which also performed the follow-up. This information was recorded in the EBMT ProMISe database, which were made available for this study via the German registry for stem cell transplantation (DRST). Data was recorded at day 0, day 100 and every year thereafter. Missing data for ABO, CMV and date of aGvHD in the DRST file was requested directly from the centers. All patients and donors provided consent for HLA-typing. All patients provided consent for analysis of the clinical data for scientific purposes. The study was approved by the ethical committee of the University of Ulm. The procedures followed were in accordance with the Helsinki Declaration. We agree with the policy regarding deposition of publication-related data and sharing of reagents. The paper reports primary data. The manuscript has not been drafted and written by a ghost writer.

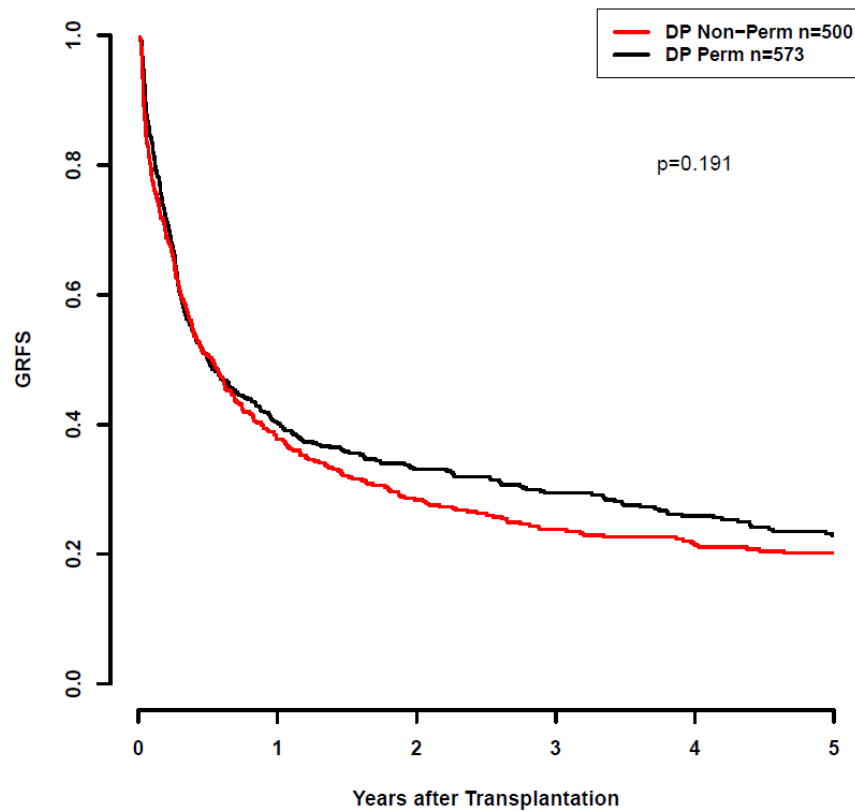
Supp1: 10/10, DP perm vs. non-perm (GvHD III-IV)



| | | | | |
|-----------------|------|-----|-----|-----|
| DP Non-Perm (n) | 1000 | 391 | 237 | 152 |
| DP Perm (n) | 1450 | 612 | 349 | 235 |

Supp1: GRFS in 10/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP Perm vs. DP Non-Perm cases, where DP Perm = DP matched or TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched ($p=0.014$). Graft vs Host disease- and relapse-free survival (GvHD III-IV)

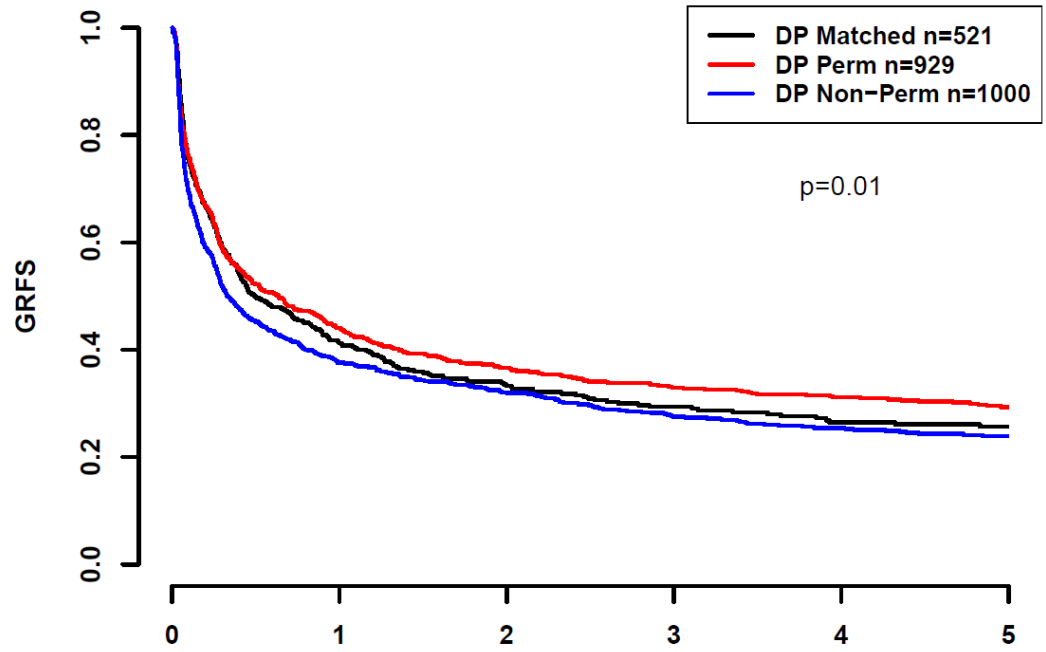
Supp2: 9/10, DP perm vs. non-perm (GvHD III-IV)



| | | | | |
|-----------------|-----|-----|-----|----|
| DP Non-Perm (n) | 500 | 174 | 95 | 68 |
| DP Perm (n) | 573 | 200 | 121 | 75 |

Supp2: GRFS in 9/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP Perm vs. DP Non-Perm cases, where DP Perm = DP matched or TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched ($p=0.191$). Graft vs Host disease- and relapse-free survival (GvHD III-IV)

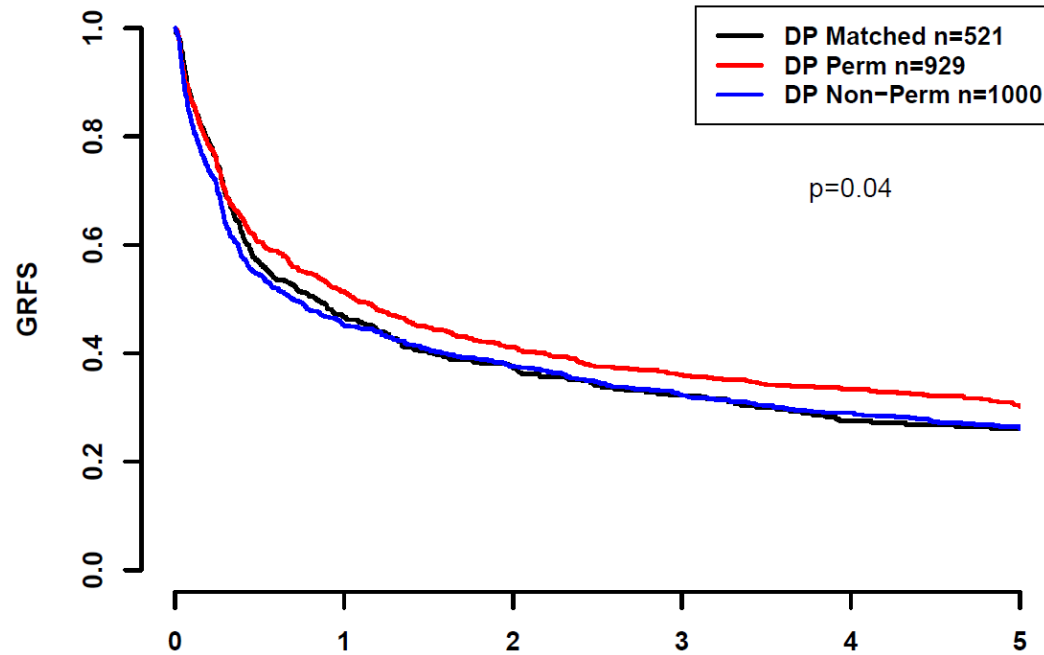
Supp3: 10/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|------------------|-----------------------------|-----|-----|-----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 521 | 167 | 94 | 59 |
| DP perm. (n) | 929 | 315 | 185 | 117 |
| DP non-perm. (n) | 1000 | 351 | 207 | 149 |

Supp3: GRFS in 10/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.01). Graft vs Host disease- and relapse-free survival (GvHD II-IV)

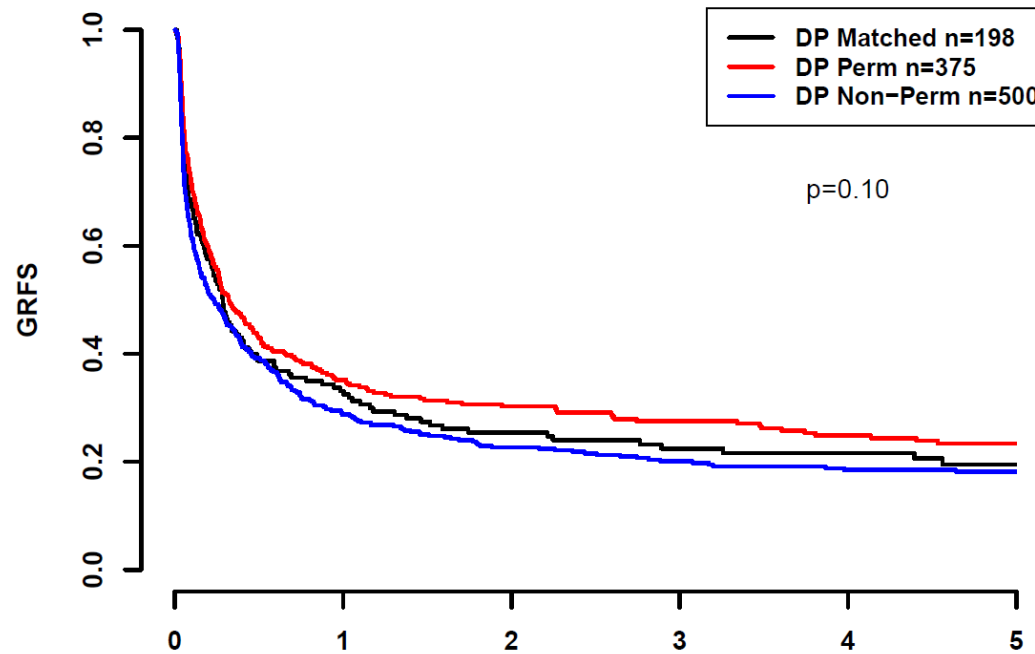
Supp4: 10/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|-----|-----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 521 | 195 | 110 | 67 |
| DP Perm (n) | 929 | 391 | 237 | 152 |
| DP Non-Perm (n) | 1000 | 418 | 240 | 168 |

Supp4: GRFS in 10/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.04). Graft vs Host disease- and relapse-free survival (GvHD III-IV)

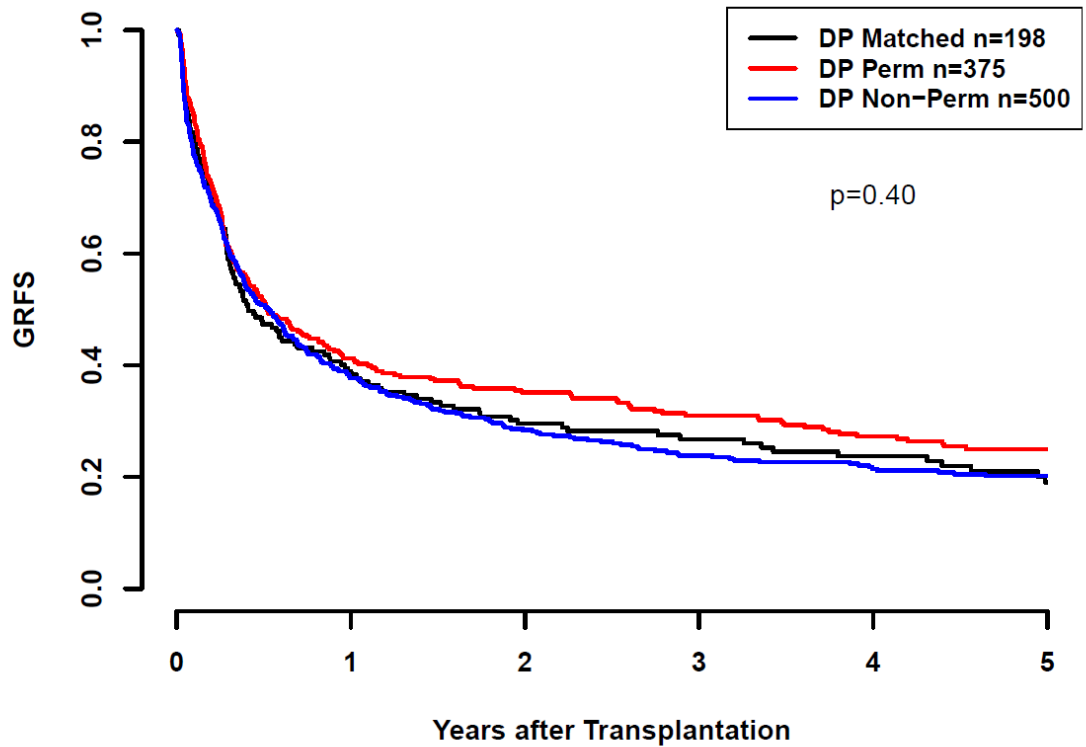
Supp5: 9/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|----|----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 198 | 54 | 29 | 18 |
| DP Perm (n) | 375 | 130 | 73 | 52 |
| DP Non-Perm (n) | 500 | 111 | 69 | 45 |

Supp5: GRFS in 9/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.10). Graft vs Host disease- and relapse-free survival (GvHD II-IV)

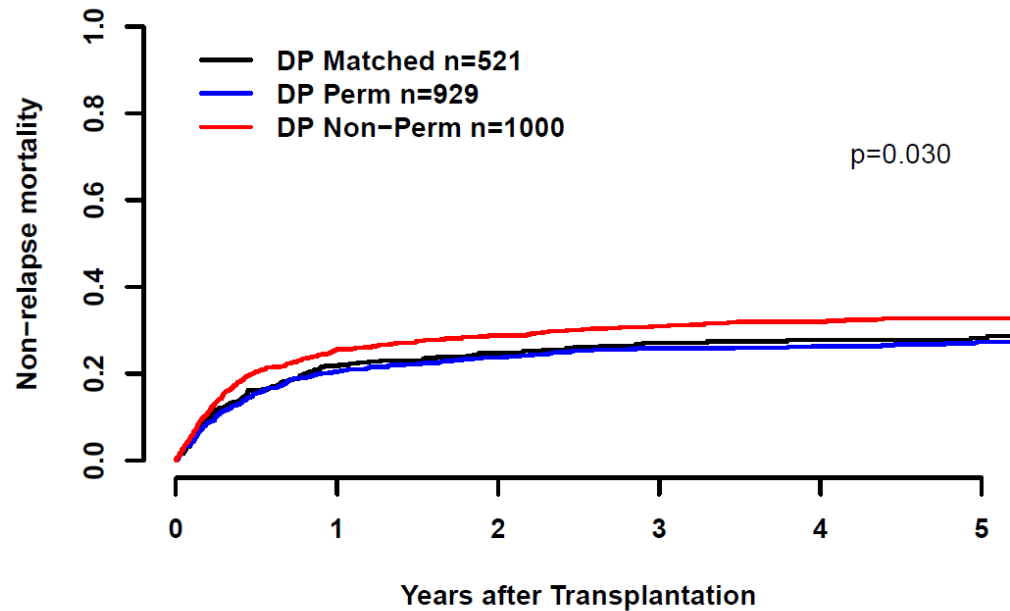
Supp6: 9/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|----|----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 198 | 67 | 39 | 22 |
| DP Perm (n) | 375 | 174 | 95 | 68 |
| DP Non-Perm (n) | 500 | 133 | 83 | 54 |

Supp6: GRFS in 9/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.40). Graft vs Host disease- and relapse-free survival (GvHD III-IV)

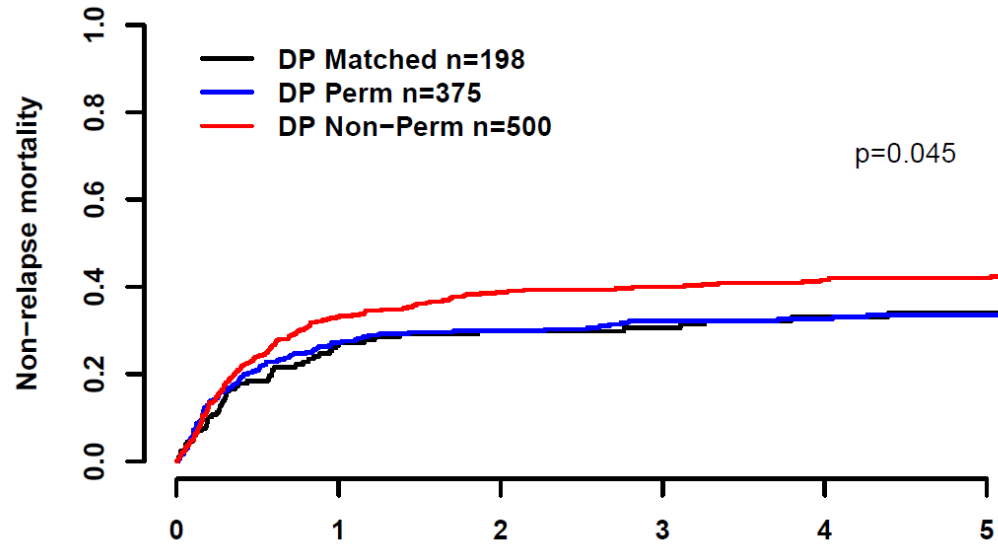
Supp7 (A): 10/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|-----|-----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 521 | 207 | 118 | 73 |
| DP Perm (n) | 929 | 451 | 258 | 182 |
| DP Non-Perm (n) | 1000 | 429 | 258 | 169 |

Supp7(A): NRM in 10/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.03).

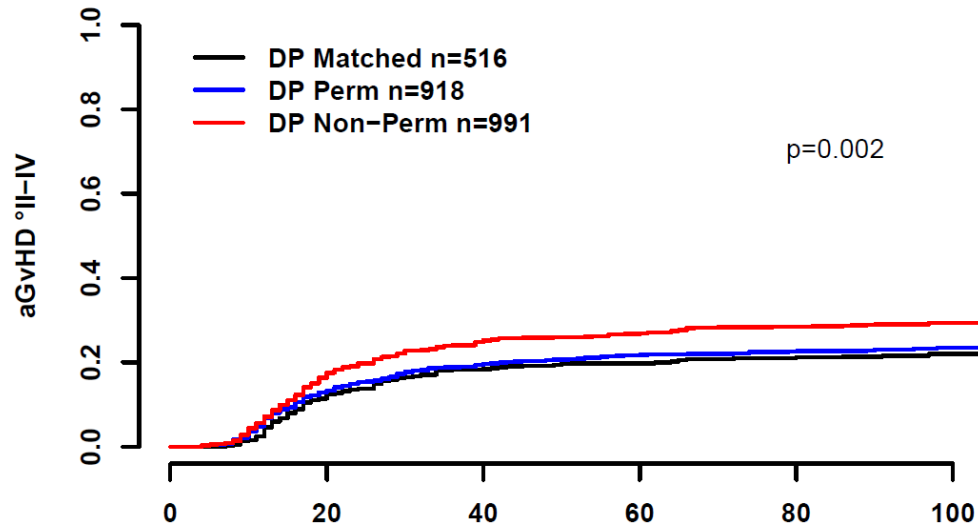
Supp7 (B): 9/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|-----|----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 198 | 77 | 47 | 27 |
| DP Perm (n) | 375 | 151 | 95 | 63 |
| DP Non-Perm (n) | 500 | 193 | 106 | 76 |

Supp7(B): NRM in 9/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.045).

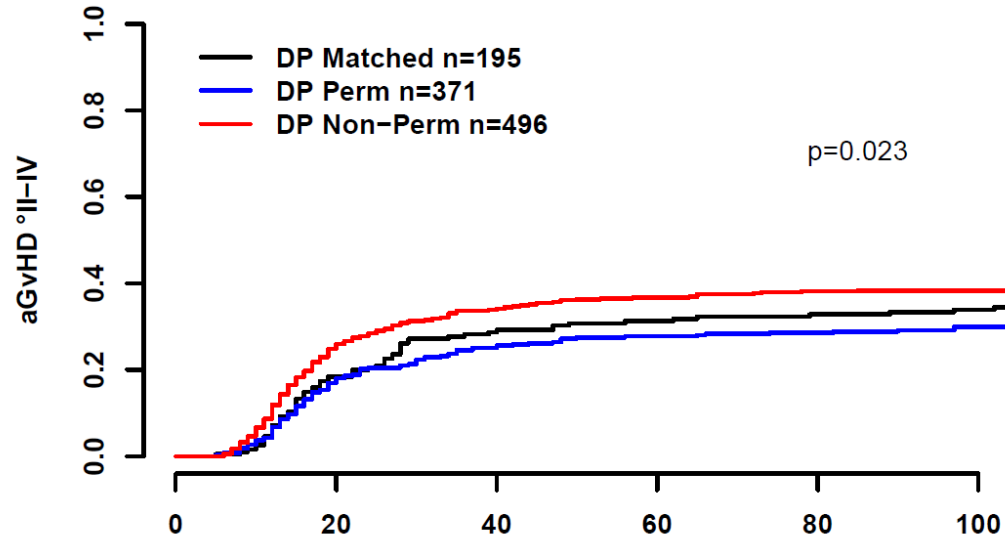
Supp7 (C): 10/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Days after Transplantation | | | | | |
|-----------------|----------------------------|-----|-----|-----|-----|-----|
| | 0 | 20 | 40 | 60 | 80 | 100 |
| DP Matched (n) | 516 | 438 | 374 | 349 | 324 | 290 |
| DP Perm (n) | 918 | 763 | 679 | 623 | 591 | 525 |
| DP Non-Perm (n) | 991 | 792 | 666 | 609 | 562 | 500 |

Supp7(C): aGvHD II-IV in 10/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.002).

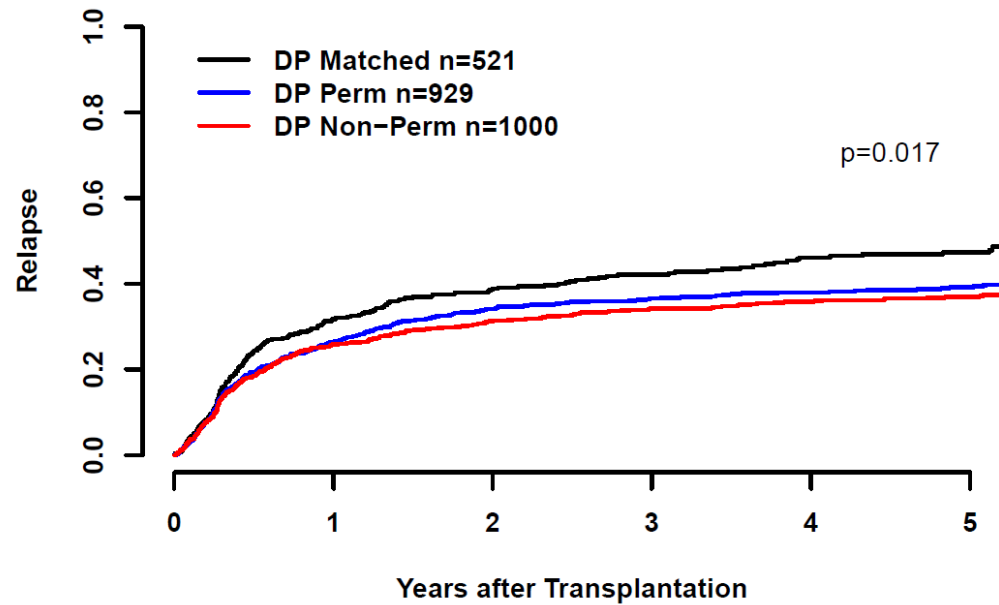
Supp7 (D): 9/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Days after Transplantation | | | | | |
|-----------------|----------------------------|-----|-----|-----|-----|-----|
| | 0 | 20 | 40 | 60 | 80 | 100 |
| DP Matched (n) | 195 | 153 | 128 | 117 | 107 | 92 |
| DP Perm (n) | 371 | 298 | 253 | 226 | 207 | 185 |
| DP Non-Perm (n) | 496 | 360 | 295 | 266 | 243 | 227 |

Supp7(D): aGvHD II-IV in 9/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.023).

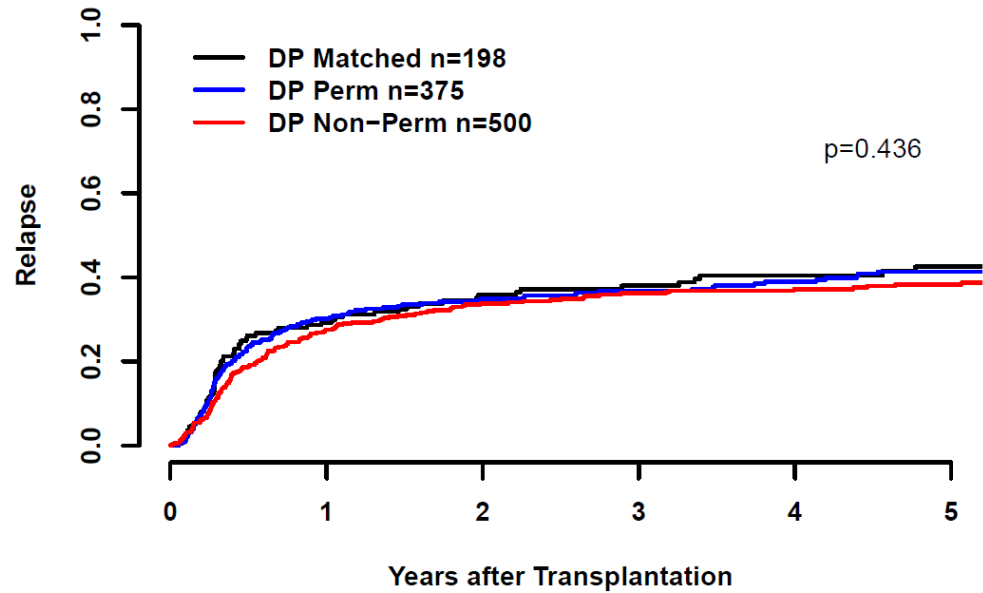
Supp7 (E): 10/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|-----|-----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 521 | 203 | 114 | 71 |
| DP Perm (n) | 929 | 442 | 256 | 181 |
| DP Non-Perm (n) | 1000 | 421 | 256 | 168 |

Supp7(E): Relapse in 10/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched ($p=0.017$).

Supp7 (F): 9/10, DP Matched vs. DP Perm. vs. DP Non-Perm.



| | Years after Transplantation | | | |
|-----------------|-----------------------------|-----|-----|----|
| | 0 | 1 | 2 | 3 |
| DP Matched (n) | 198 | 77 | 45 | 26 |
| DP Perm (n) | 375 | 149 | 94 | 61 |
| DP Non-Perm (n) | 500 | 189 | 103 | 74 |

Supp7(D): Relapse in 9/10 HLA matched cases with respect to DP mismatch permissiveness according to TCE3. DP matched vs. DP Perm vs. DP Non-Perm cases, where DP Perm = TCE3 permissively mismatched and DP Non-Perm = DP TCE3 non-permissively mismatched (p=0.436).

Supp8: Cohort flowchart with regard to DP mismatch categorization

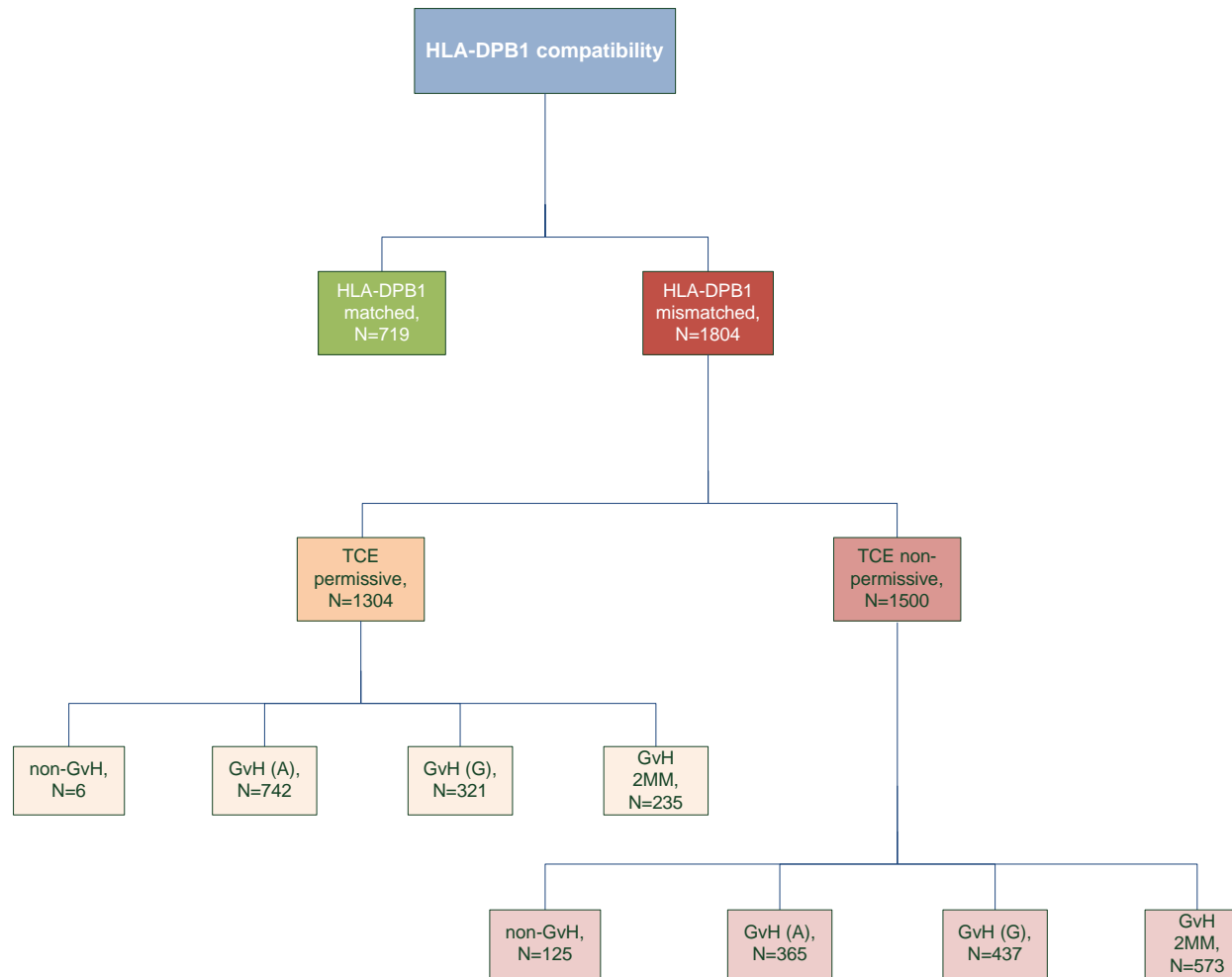


Table S1: Analysis of time-dependent variables

| Endpoint | Variable | Time Period Post Tx | HR (CI) | P-value |
|----------|--------------------------|---------------------|------------------|---------|
| OS | Advanced disease stage | Until 1 year | 2.04 (1.77-2.35) | <0.001 |
| | | After 1 year | 1.38 (1.10-1.72) | 0.005 |
| | MAC | Until 100 days | 1.59 (1.31-1.94) | <0.001 |
| | | After 100 days | 1.06 (0.92-1.22) | 0.395 |
| | In vivo T-cell depletion | Until 100 days | 1.02 (0.84-1.24) | 0.848 |
| | | After 100 days | 0.81 (0.70-0.95) | 0.007 |
| GRFS | Patient age | Until 100 days | 1.00 (1.00-1.01) | 0.084 |
| | | After 100 days | 1.02 (1.02-1.03) | <0.001 |
| | In vivo T-cell depletion | Until 200 days | 0.74 (0.66-0.82) | <0.001 |
| | | After 200 days | 0.99 (0.82-1.19) | 0.901 |
| | TCE3 Non-permissive | Until 100 days | 1.23 (1.11-1.36) | <0.001 |
| | | After 100 days | 1.07 (0.94-1.22) | 0.311 |
| | TCE3 Non-permissive GvH | Until 100 days | 1.31 (1.16-1.48) | <0.001 |
| | | After 100 days | 1.03 (0.87-1.21) | 0.757 |
| NRM | Advanced disease stage | Until 1 year | 1.72 (1.45-2.03) | <0.001 |
| | | After 1 year | 1.03 (0.74-1.43) | 0.878 |
| | MAC | Until 100 days | 1.69 (1.37-2.08) | <0.001 |
| | | After 100 days | 0.99 (0.83-1.19) | 0.939 |
| REL | Advanced disease stage | Until 1 year | 2.63 (2.23-3.11) | <0.001 |
| | | After 1 year | 1.76 (1.38-2.25) | <0.001 |
| | KPS<80 | Until 200 days | 2.02 (1.55-2.63) | <0.001 |
| | | After 200 days | 0.97 (0.54-1.73) | 0.916 |

Abbreviations: OS= Overall survival, GRFS=GvHD and relapse free survival, NRM=Non-relapse mortality, REL=Relapse, MAC=Myeloablative conditioning, TCE3=T-cell epitope 3 matching algorithm, KPS=Karnofsky Performance Score, Tx=Transplantation, HR=Hazard ratio, CI=Confidence interval.

Table S2: Multivariate Analysis aGvHD III-IV

| | aGvHD III-IV | |
|-------------------------------------|------------------|------------------|
| | HR (CI) | P-value |
| Patient Age | - | |
| Early stage disease | - | |
| Intermediate stage disease | - | |
| Advanced disease stage | - | |
| 10/10 HLA | 1.00 | |
| 9/10 HLA | 1.61 (1.32-1.96) | <0.001 |
| Patient HLA-C KIR Ligand group C1x | - | |
| Patient HLA-C KIR Ligand group C2C2 | - | |
| Donor age 18-30 | 1.00 | |
| Donor age 31-45 | 1.38 (1.09-1.73) | <0.001 |
| Donor age 46-60 | 1.12 (0.99-1.26) | <0.001 |
| P-D CMV neg-neg | - | |
| P-D CMV neg-pos | - | |
| P-D CMV pos neg | - | |
| P-D CMV pos pos | - | |
| RIC | - | |
| MAC | - | |
| KPS 80-100 | - | |
| KPS <80 | - | |
| No in-vivo T-cell depletion | 1.00 | |
| In vivo T-cell depletion | 0.62 (0.49-0.77) | <0.001 |
| Year of Tx 2000-2003 | 1.00 | |
| Year of Tx 2004-2009 | 0.58 (0.32-1.05) | 0.073 |
| Year of Tx 2010-2017 | 0.61 (0.33-1.13) | 0.118 |
| | | |
| TCE3 Permissive/DP matched | 1.00 | |
| TCE3 Non-permissive | 1.38 (1.14-1.67) | <0.001 |
| | | |
| DP matched | 1.00 | |
| TCE3 permissive | 1.02 (0.77-1.34) | 0.882 |
| TCE3 Non-permissive | 1.40 (1.08-1.81) | 0.011 |
| | | |
| TCE3 Permissive/DP matched | 1.00 | |
| TCE3 Non-permissive GvH | 1.55 (1.23-1.94) | <0.001 |
| TCE3 Non-permissive HvG | 1.23 (0.97-1.55) | 0.088 |

Abbreviations: P-D Patient-Donor, RIC=Reduced intensity conditioning, MAC=Myeloablative conditioning, TCE3= T-cell epitope 3 matching, HR=Hazard ratio, CI=Confidence interval. - = not significant. Statistical significance marked in bold.

Table S3: Multivariate analysis of Relapse in advanced-disease-stage patients

| | Relapse | |
|-------------------------------------|------------------|--------------|
| | HR (CI) | P-value |
| Patient Age | - | |
| Early stage disease | - | |
| Intermediate stage disease | - | |
| Advanced disease stage | - | |
| 10/10 HLA | - | |
| 9/10 HLA | - | |
| Patient HLA-C KIR Ligand group C1x | - | |
| Patient HLA-C KIR Ligand group C2C2 | - | |
| Donor age 18-30 | - | |
| Donor age 31-45 | - | |
| Donor age 46-60 | - | |
| P-D CMV neg-neg | - | |
| P-D CMV neg-pos | - | |
| P-D CMV pos neg | - | |
| P-D CMV pos pos | - | |
| RIC | - | |
| MAC | - | |
| KPS 80-100 | 1.00 | |
| KPS <80 | 1.53 (1.13-2.05) | 0.005 |
| No in-vivo T-cell depletion | 1.00 | |
| In vivo T-cell depletion | 0.80 (0.63-1.01) | 0.062 |
| Year of Tx 2000-2003 | 1.00 | |
| Year of Tx 2004-2009 | 1.81 (0.90-3.63) | 0.095 |
| Year of Tx 2010-2017 | 2.15 (1.05-4.37) | 0.035 |
| | | |
| TCE3 Permissive/DP matched | 1.00 | |
| TCE3 Non-permissive | 0.83 (0.70-0.98) | 0.028 |
| | | |
| DP matched | 1.00 | |
| TCE3 permissive | 0.88 (0.71-1.11) | 0.288 |
| TCE3 Non-permissive | 0.76 (0.61-0.96) | 0.02 |
| | | |
| TCE3 Permissive/DP matched | 1.00 | |
| TCE3 Non-permissive GvH | 0.83 (0.67-1.04) | 0.112 |
| TCE3 Non-permissive HvG | 0.82 (0.67-1.01) | 0.061 |

Abbreviations: P-D Patient-Donor, RIC=Reduced intensity conditioning, MAC=Myeloablative conditioning, TCE3= T-cell epitope 3 matching, HR=Hazard ratio, CI=Confidence interval. - = not significant. Statistical significance marked in bold.

Table S4: Death cause analysis

| | GvHD | Infection | LPD | Other non TRM/REL | Poor Graft Function | Relapse/Progress | Sec.Mal | Toxicity | Unknown |
|--|-------------|------------------|------------|--------------------------|----------------------------|-------------------------|----------------|-----------------|----------------|
| Non-permissive mismatch, N=1500 | 60 (8.1%) | 251 (34.1%) | 3 (0.4%) | 93 (12.6%) | 2 (0.3%) | 249 (33.8%) | 12 (1.6%) | 60 (8.1%) | 7 (1.0%) |
| Permissive mismatch, N=1304 | 37 (6.2%) | 190 (31.7%) | 1 (0.2%) | 63 (10.5%) | 2 (0.3%) | 249 (41.6%) | 10 (1.7%) | 42 (7.0%) | 5 (0.8%) |
| DP-matched, N=719 | 24 (6.9%) | 98 (28.1%) | 0 (0.0%) | 40 (11.5%) | 0 (0.0%) | 155 (44.4%) | 3 (0.9%) | 24 (6.9%) | 5 (1.4%) |

Abbreviations: LPD = Lymphoproliferative disease, Sec.Mal. = Secondary malignancy

Table S5: Multivariate analysis in 10/10 HLA matched cases

| | OS | | GRFS | | NRM | | aGVHD II-IV | | Relapse | |
|-------------------------------------|--------------------|------------------|-------------------|------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
| | HR (CI) | P-value | HR (CI) | P-value | HR (CI) | P-value | HR (CI) | P-value | HR (CI) | P-value |
| Patient Age | 1.02 (1.01-1.02) | <0.001 | 1.01 (1.00-1.01)* | <0.001 | 1.02 (1.01-1.03) | <0.001 | - | | 1.01 (1.00-1.01) | 0.002 |
| Early stage disease | 1.00 | | 1.00 | | 1.00 | | - | | 1.00 | |
| Intermediate stage disease | 1.24 (1.05-1.46) | 0.010 | 1.30 (1.14-1.48) | <0.001 | 1.01 (0.82-1.24) | 0.923 | - | | 1.56 (1.33-1.84) | <0.001 |
| Advanced disease stage | 1.92 (1.65- 2.25)* | <0.001 | 1.57 (1.38-1.78) | <0.001 | 1.40 (1.16-1.68)* | <0.001 | - | | 1.90 (1.62-2.24)* | <0.001 |
| Patient HLA-C KIR Ligand group C1x | 1.00 | | - | | - | | - | | - | |
| Patient HLA-C KIR Ligand group C2C2 | 1.13 (0.96-1.34) | 0.143 | - | | - | | - | | - | |
| Donor age 18-30 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | - | |
| Donor age 31-45 | 1.18 (1.03-1.36) | 0.015 | 1.08 (0.97-1.21) | 0.158 | 1.19 (1.01-1.41) | 0.043 | 1.18 (0.99-1.42) | 0.063 | - | |
| Donor age 46-60 | 1.25 (1.04-1.51) | 0.018 | 1.12 (0.97-1.30) | 0.130 | 1.44 (1.15-1.79) | 0.001 | 1.33 (1.05-1.69) | 0.016 | - | |
| P-D CMV neg-neg | 1.00 | | - | | - | | - | | - | |
| P-D CMV neg-pos | 1.16 (0.92-1.47) | 0.205 | - | | - | | - | | - | |
| P-D CMV pos neg | 1.08 (0.91-1.28) | 0.383 | - | | - | | - | | - | |
| P-D CMV pos pos | 1.07 (0.92-1.25) | 0.396 | - | | - | | - | | - | |
| RIC | 1.00 | | 1.00 | | 1.00 | | - | | - | |
| MAC | 1.22 (1.05-1.41)* | 0.009 | 1.11 (0.98-1.25) | 0.099 | 1.27 (1.08-1.50)* | 0.005 | - | | - | |
| KPS 80-100 | 1.00 | | 1.00 | | - | | - | | 1.00 | |
| KPS <80 | 1.39 (1.05-1.85) | 0.023 | 1.27 (1.01-1.59) | 0.039 | - | | - | | 1.36 (1.03-1.79)* | 0.032 |
| No in-vivo T-cell depletion | 1.00 | | 1.00 | | - | | 1.00 | | 1.00 | |
| In vivo T-cell depletion | 0.80 (0.67-0.95)* | 0.013 | 0.79 (0.69-0.91)* | 0.001 | - | | 0.67 (0.56-0.80) | <0.001 | 0.84 (0.72-0.99) | 0.034 |
| Year of Tx 2000-2003 | - | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Year of Tx 2004-2009 | - | | 0.54 (0.36-0.82) | 0.004 | 0.48 (0.30-0.77) | 0.002 | 0.53 (0.29-0.97) | 0.039 | 1.40 (0.79-2.48) | 0.248 |
| Year of Tx 2010-2014 | - | | 0.53 (0.35-0.82) | 0.004 | 0.45 (0.28-0.71) | <0.001 | 0.52 (0.28-0.96) | 0.036 | 1.42 (0.79-2.54) | 0.242 |
| TCE3 Permissive/DP matched | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| TCE3 Non-permissive | 1.01 (0.89-1.14) | 0.890 | 1.14 (1.03-1.26)* | 0.009 | 1.19 (1.03-1.38) | 0.018 | 1.33 (1.14-1.56) | <0.001 | 0.89 (0.79-1.01) | 0.074 |
| DP matched | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| TCE3 permissive | 0.93 (0.79-1.09) | 0.393 | 0.96 (0.84-1.09) | 0.546 | 0.99 (0.81-1.21) | 0.938 | 1.13 (0.90-1.41) | 0.289 | 0.85 (0.73-0.99) | 0.038 |
| TCE3 Non-permissive | 0.96 (0.82-1.13) | 0.656 | 1.11 (0.97-1.26)* | 0.110 | 1.19 (0.98-1.44) | 0.084 | 1.44 (1.17-1.78) | <0.001 | 0.81 (0.69-0.94) | 0.006 |
| TCE3 Permissive/DP matched | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| TCE3 Non-permissive GvH | 0.94 (0.80-1.10) | 0.431 | 1.14 (1.01-1.29)* | 0.033 | 1.15 (0.95-1.38) | 0.153 | 1.47 (1.21-1.77) | <0.001 | 0.85 (0.72-0.99) | 0.038 |
| TCE3 Non-permissive HvG | 1.08 (0.93-1.25) | 0.330 | 1.13 (1.00-1.28) | 0.042 | 1.24 (1.04-1.48) | 0.019 | 1.21 (1.00-1.47) | 0.049 | 0.94 (0.81-1.10) | 0.455 |

Abbreviations: P-D Patient-Donor, RIC=Reduced intensity conditioning, MAC=Myeloablative conditioning, TCE3= T-cell epitope 3 matching, HR=Hazard ratio, CI=Confidence interval. Covariates showing time-dependent effects are labeled with an asterisk (*), Statistical significance marked in bold.

Table S6: Multivariate analysis in 9/10 HLA matched cases

| | OS | | GRFS | | NRM | | aGVHD II-IV | | Relapse | |
|-------------------------------------|--------------------|------------------|-------------------|------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
| | HR (CI) | P-value | HR (CI) | P-value | HR (CI) | P-value | HR (CI) | P-value | HR (CI) | P-value |
| Patient Age | 1.02 (1.01-1.03) | <0.001 | 1.01 (1.00-1.02)* | <0.001 | 1.03 (1.02-1.04) | <0.001 | - | | 1.00 (0.99-1.01) | 0.265 |
| Early stage disease | 1.00 | | 1.00 | | 1.00 | | - | | 1.00 | |
| Intermediate stage disease | 1.21 (0.97-1.51) | 0.085 | 1.10 (0.92-1.32) | 0.304 | 1.03 (0.80-1.32) | 0.806 | - | | 1.80 (1.40-2.30) | <0.001 |
| Advanced disease stage | 1.75 (1.41- 2.16)* | <0.001 | 1.45 (1.21-1.74) | <0.001 | 1.18 (0.92-1.50)* | 0.185 | - | | 2.37 (1.85-3.05)* | <0.001 |
| Patient HLA-C KIR Ligand group C1x | 1.00 | | - | | - | | - | | - | |
| Patient HLA-C KIR Ligand group C2C2 | 1.32 (1.06-1.64) | 0.012 | - | | - | | - | | - | |
| Donor age 18-30 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | - | |
| Donor age 31-45 | 1.04 (0.85-1.28) | 0.685 | 1.09 (0.92-1.29) | 0.320 | 1.16 (0.91-1.48) | 0.221 | 1.14 (0.89-1.46) | 0.308 | - | |
| Donor age 46-60 | 1.28 (1.00-1.63) | 0.046 | 1.11 (0.91-1.36) | 0.303 | 1.61 (1.22-2.11) | <0.001 | 1.14 (0.85-1.53) | 0.390 | - | |
| P-D CMV neg-neg | 1.00 | | - | | - | | - | | - | |
| P-D CMV neg-pos | 1.07 (0.78-1.46) | 0.660 | - | | - | | - | | - | |
| P-D CMV pos neg | 1.23 (0.98-1.55) | 0.070 | - | | - | | - | | - | |
| P-D CMV pos pos | 1.14 (0.91-1.44) | 0.250 | - | | - | | - | | - | |
| RIC | 1.00 | | 1.00 | | 1.00 | | - | | - | |
| MAC | 1.29 (1.05-1.59)* | 0.017 | 1.26 (1.06-1.50) | 0.010 | 1.32 (1.06-1.65)* | 0.013 | - | | - | |
| KPS 80-100 | 1.00 | | 1.00 | | - | | - | | 1.00 | |
| KPS <80 | 1.89 (1.36-2.62) | <0.001 | 1.57 (1.17-2.10) | 0.002 | - | | - | | 1.37 (0.98-1.90)* | 0.065 |
| No in-vivo T-cell depletion | 1.00 | | 1.00 | | - | | 1.00 | | 1.00 | |
| In vivo T-cell depletion | 0.90 (0.70-1.16)* | 0.415 | 0.75 (0.61-0.93)* | 0.007 | - | | 0.69 (0.53-0.88) | 0.003 | 0.71 (0.56-0.90) | 0.004 |
| Year of Tx 2000-2003 | - | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Year of Tx 2004-2009 | - | | 0.65 (0.42-1.01) | 0.055 | 0.65 (0.39-1.08) | 0.098 | 0.60 (0.37-0.97) | 0.035 | 3.23 (1.25-8.39) | 0.016 |
| Year of Tx 2010-2014 | - | | 0.68 (0.43-1.09) | 0.107 | 0.73 (0.43-1.24) | 0.244 | 0.65 (0.39-1.07) | 0.090 | 3.27 (1.25-8.56) | 0.016 |
| TCE3 Permissive/DP matched | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| TCE3 Non-permissive | 1.05 (0.89-1.24) | 0.573 | 1.19 (1.03-1.37)* | 0.015 | 1.30 (1.07-1.58) | 0.007 | 1.34 (1.09-1.65) | 0.004 | 0.90 (0.75-1.08) | 0.256 |
| DP matched | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| TCE3 permissive | 0.87 (0.64-1.11) | 0.262 | 0.90 (0.73-1.10) | 0.311 | 0.93 (0.69-1.24) | 0.612 | 0.99 (0.65-1.18) | 0.395 | 0.99 (0.77-1.28) | 0.930 |
| TCE3 Non-permissive | 0.96 (0.76-1.20) | 0.703 | 1.11 (0.92-1.35)* | 0.287 | 1.24 (0.95-1.62) | 0.112 | 1.24 (0.94-1.63) | 0.133 | 0.89 (0.69-1.15) | 0.387 |
| TCE3 Permissive/DP matched | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| TCE3 Non-permissive GvH | 0.95 (0.77-1.18) | 0.647 | 1.24 (1.04-1.47)* | 0.016 | 1.32 (1.04-1.67) | 0.022 | 1.58 (1.24-2.03) | <0.001 | 0.78 (0.62-0.99) | 0.038 |
| TCE3 Non-permissive HvG | 1.14 (0.94-1.39) | 0.182 | 1.15 (0.97-1.36) | 0.112 | 1.29 (1.02-1.62) | 0.030 | 1.14 (0.89-1.47) | 0.305 | 1.02 (0.83-1.27) | 0.818 |

Abbreviations: P-D Patient-Donor, RIC=Reduced intensity conditioning, MAC=Myeloablative conditioning, TCE3= T-cell epitope 3 matching, HR=Hazard ratio, CI=Confidence interval. Covariates showing time-dependent effects are labeled with an asterisk (*), Statistical significance marked in bold.

Table S7: cGvHD multivariate analysis in whole cohort

| | cGvHD | |
|-----------------------------|--------------------|------------------|
| | HR (CI) | P-value |
| Early stage disease | 1.00 | |
| Intermediate stage disease | 0.94 (0.79-1.11) | 0.452 |
| Advanced disease stage | 0.85 (0.72- 1.02)* | 0.075 |
| 10/10 HLA | 1.00 | |
| 9/10 HLA | 1.19 (1.04-1.36) | 0.009 |
| Donor age 18-30 | 1.00 | |
| Donor age 31-45 | 1.13 (0.98-1.31) | 0.084 |
| Donor age 46-60 | 0.95 (0.78-1.16) | 0.610 |
| RIC | 1.00 | |
| MAC | 0.86 (0.75-0.98)* | 0.029 |
| KPS 80-100 | 1.00 | |
| KPS <80 | 1.28 (0.90-1.81) | 0.174 |
| No in-vivo T-cell depletion | 1.00 | |
| In vivo T-cell depletion | 0.69 (0.59-0.80)* | <0.001 |
| | | |
| TCE3 Permissive/DP matched | 1.00 | |
| TCE3 Non-permissive | 1.08 (0.95-1.23) | 0.240 |
| | | |
| DP matched | 1.00 | |
| TCE3 permissive | 1.03 (0.86-1.23) | 0.771 |
| TCE3 Non-permissive | 1.10 (0.92-1.31) | 0.296 |
| | | |
| TCE3 Permissive/DP matched | 1.00 | |
| TCE3 Non-permissive GvH | 1.03 (0.88-1.21) | 0.686 |
| TCE3 Non-permissive HvG | 1.12 (0.96-1.31) | 0.136 |

Abbreviations: P-D Patient-Donor, RIC=Reduced intensity conditioning, MAC=Myeloablative conditioning, TCE3= T-cell epitope 3 matching, HR=Hazard ratio, CI=Confidence interval. Covariates showing time-dependent effects are labeled with an asterisk (*), - = not included in model. Statistical significance marked in bold.