**Article:**
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**Supplementary data**

**Supplementary Methods**

This is a retrospective, multicenter, registry-based study approved by the Chronic Malignancies Working Party (CMWP) of the EBMT in accordance with the Declaration of Helsinki and Good Clinical Practice guidelines. The EBMT is a non-profit, scientific society representing more than 700 transplant centers mainly in Europe. EBMT centers commit to obtain informed consent according to the local regulations applicable at the time of transplantation to report pseudonymized data to the EBMT. Data are entered, managed, and maintained in a central database with internet access; each EBMT center is represented in this database.

Neutrophil engraftment was defined as the first of three consecutive days of achieving a sustained peripheral blood neutrophil count of $>0.5 \times 10^9$/L. Platelet recovery was defined as the first of at least 7 days with a platelet count of more than $>20 \times 10^9$/L without any transfusion during the 5 days before. Primary graft failure (PGF) was defined as a failure to reach neutrophil engraftment within the first 42 days after stem cell infusion. Acute GvHD and limited and extensive cGvHD were scored according to previously reported criteria.[32,33] GRFS was defined as survival without any occurrence of acute-GvHD (aGvHD) grade III-IV, extensive chronic-GvHD (cGvHD), graft failure (GF)/rejection and relapse.

Outcomes

The primary endpoint was overall survival (OS) after allo-HCT. Secondary endpoints were progression free survival (PFS), cGvHD-free survival (cGFS) and GRFS and cumulative incidences of relapse and non-relapse mortality (NRM), neutrophil and platelet engraftment, primary GF (PGF) and secondary GF (sGF), aGvHD II-IV and limited and cGvHD of all grades and severe/extensive.

*Statistical analysis*

Clinical, demographical and transplantation related characteristics at baseline were tabulated and expressed as median and interquartile range (IQR) for continuous variables and frequencies for categorical variables. Median follow-up after allo-HCT was calculated using the reverse Kaplan–

Meier (KM) method. The primary endpoint (OS) and secondary endpoints PFS and GRFS were analyzed using the KM method and group differences were evaluated using the log-rank test. Relapse/progression and NRM were analyzed together in a competing risk framework. The cumulative incidences of aGvHD II-IV, cGvHD, PGF and SGF were each analyzed separately with competing events second transplant and death. Cumulative incidences of neutrophil and platelet engraftment were analyzed with competing event death. Gray's test was used to compare differences in cumulative incidences between groups.

Multivariable Cox proportional hazards models were fitted to assess the impact of PTCy vs ATG, adjusted for several risk factors simultaneously on OS, GRFS and PFS and cause specific hazards models were fitted for outcomes aGvHD II-IV, overall cGvHD and severe cGvHD and relapse/progression and NRM. Covariate constellations were identical between outcomes and were defined beforehand based on clinical relevance: GvHD prophylaxis (PTCy versus ATG), patient age (decades), DIPSS[34] at allo-HCT (high-intermediate risk, high risk versus low-intermediate risk), donor type (MMUD versus MUD), Hematopoietic Cell Transplantation Comorbidity Index (HCT-CI, intermediate risk, high risk versus low risk), interval from diagnosis to allo-HCT (months), Ruxolitinib used (yes versus no), conditioning regimen (RIC versus MAC), MF type (sMF versus PMF) and transplant year. All models included a gamma-distributed frailty term for center, to adjust for confounding-by-centre. The missing indicator method was used for patients with missing data on DIPSS or Ruxolitinib use; they were categorized as 'Missing' for the respective covariates. Patients with missing data on any other risk factors were excluded from the corresponding analyses. Hazard ratios with 95% confidence intervals are provided and corresponding p-values are calculated using the Wald-test. The frailty term was tested using a likelihood ratio test. A second set of models was fit, including an interaction between GvHD prophylaxis and donor type, otherwise following the same structure as described above.

All statistical tests were two-sided, and $p < .05$ were considered statistically significant. All analyses were performed in R version 4.2.2 using "survival," "cmprsk" and "prodlim".

**Supplementary Results:**

A total of 2607 MF patients were included: 192 who received PTCY and 2415 who received ATG as GvHD prophylaxis. Data regarding ATG doses were available for 1976/2415 (81.8%) patients, which was all rabbit-derived ATG of two commercial formulations/brands; either Thymoglobulin® (Sanofi) for 978 (49%; with a median dose of 5 mg/kg (range 0.2-10)) or Grafalon® (Neovii, formerly ATG-Fresenius) for 998 (51%; with a median dose of 35 mg/kg (range 20-60)). Disease characteristics at diagnosis were similar across the PTCY and ATG groups.

*Acute and chronic GvHD*

When comparing MUD and MMUD with respect to GvHD incidence, the rate of grade II-IV aGvHD was higher with MMUD: 35% (95 CI 30-39%) vs 30% (95 CI 27-32%) with MUD (p=0.032, **Supplementary Table S2**), regardless of the GvHD prophylaxis strategy.

When accounting for confounding factors, an effect of MMUD was observed (HR, 1.29; 95% CI 1.06-1.57, p=0.01; **Supplementary Table S3**). While an interaction effect was observed (p = 0.024), the rate of grade III-IV aGvHD with PTCY compared to ATG was lower with MUD (HR, 0.8; 95% CI 0.42-1.55), whereas no effect was seen with MMUD (HR, 1.04; 95% CI 0.55 - 1.97); neither comparison reached statistical significance. Other factors associated with grade II-IV aGvHD in the multivariable analysis included high-risk DIPSS and high-risk HCT-CI (**Supplementary Table S3**).

Concerning cGvHD. no further effect of donor type was observed (**Supplementary Table S2**).

We also compared outcomes between the different type of ATG given, either Thymoglobulin® or Grafalon®, and found no difference in aGvHD grade II-IV (**Supplementary Figure S2A**) but a higher incidence of grade III-IV aGvHD with Thymoglobulin®: 17% (95% CI 15-20%) vs 14% (95% CI 11-16%) with Grafalon® (p=0.03, **Supplementary Figure S2B**). On the other hand, the 3-year overall cGvHD was lower with Thymoglobulin®, 41% (95% CI 37-44%) vs 47% (95% CI 44-51%) with Grafalon® (p=0.003, **Supplementary Figure S2C**).

*OS, PFS and GRFS*

Three-year OS in the MUD cohort was higher than in the MMUD cohort: 61% (95% CI 59-64%) vs 55% (95% CI 50-60%), p=0.015 (**Supplementary Table S2)**.

When comparing the different ATG administered, either Thymoglobulin® or Grafalon®, there was a better OS and PFS with Grafalon®: OS was 57% (95% CI 54-61%) for Thymoglobulin® vs 64% (95% CI 61-68%) for Grafalon®, p<0.001, PFS was 49% (95% CI 45-52%) for Thymoglobulin® vs 57% (95% CI 53-60%) for Grafalon®, p<0.001. But the GRFS was not statistically different with 34% (95% CI 31-38%) for Thymoglobulin® vs 35% (95% CI 32-38%) for Grafalon®, p=0.4 (**Supplementary Figure S4**).

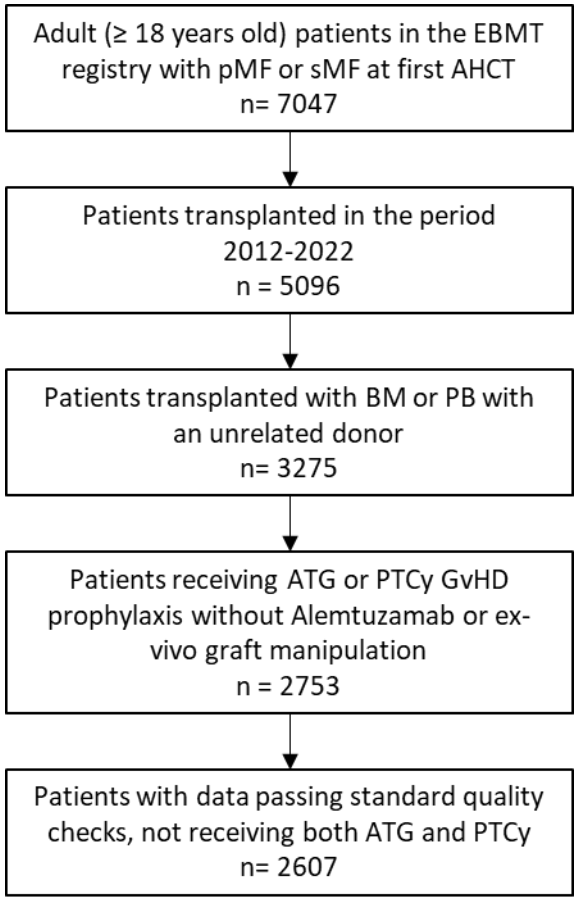
*Relapse incidence and NRM*

When comparing MUD to MMUD transplants, 3-year RI was similar between the two cohorts: 20% (95% CI 18-22%) for MUD and 20% (95% CI 16-24%) for MMUD, p=0.7 (**Supplementary Table S2)**.

Three-year NRM was slightly lower with MUD: 27% (95% CI 25-29%) vs 31% (95% CI 27-36%) with MMUD, p=0.07 (**Supplementary Table S2**). In multivariable analysis of NRM, the effect of MMUD was statistically significant, with an HR of 1.39 (95% CI 1.13-1.72), p=0.002 (**Supplementary Table S4**).

On the other hand, increasing patient age and a high HCT-CI score were associated with worse NRM (**Supplementary Table S4**).

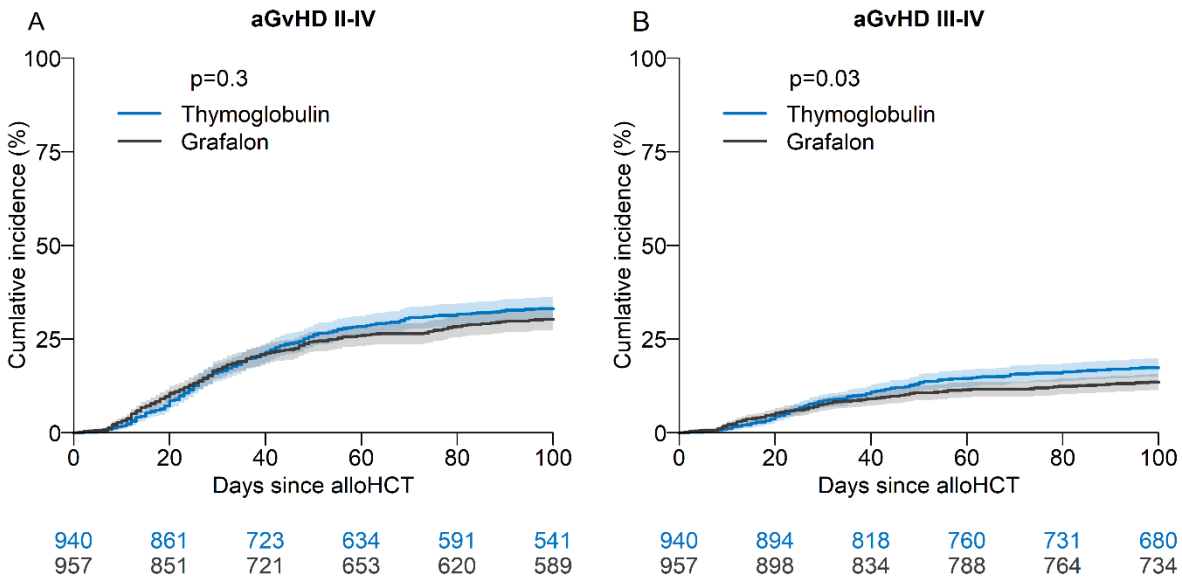
**Figure S1. Flow chart for patient inclusion**




PTCY: post-transplant cyclophosphamide, ATG: antithymocyte globulin, GvHD: graft-versus-host disease, pMF: primary myelofibrosis, sMF : secondary myelofibrosis allo-HCT: allogeneic hematopoietic cell transplantation, BM: bone marrow, PB: peripheral blood, EBMT ?.

**Figure S2. Incidence of acute and chronic graft-versus-host disease (GvHD) comparing Thymoglobulin® vs Grafalon®**

A) Acute GvHD grade II-IV B) Acute GvHD grade III-IV C) chronic GvHD


A
aGvHD II-IV
p=0.3
Thymoglobulin
Grafalon
Cumlative incidence (%)
100
75
50
25
0
0
20
40
60
80
100
Days since alloHCT
940 861 723 634 591 541
957 851 721 653 620 589
B
aGvHD III-IV
p=0.03
Thymoglobulin
Grafalon
Cumlative incidence (%)
Days since alloHCT
940 894 818 760 731 680
957 898 834 788 764 734

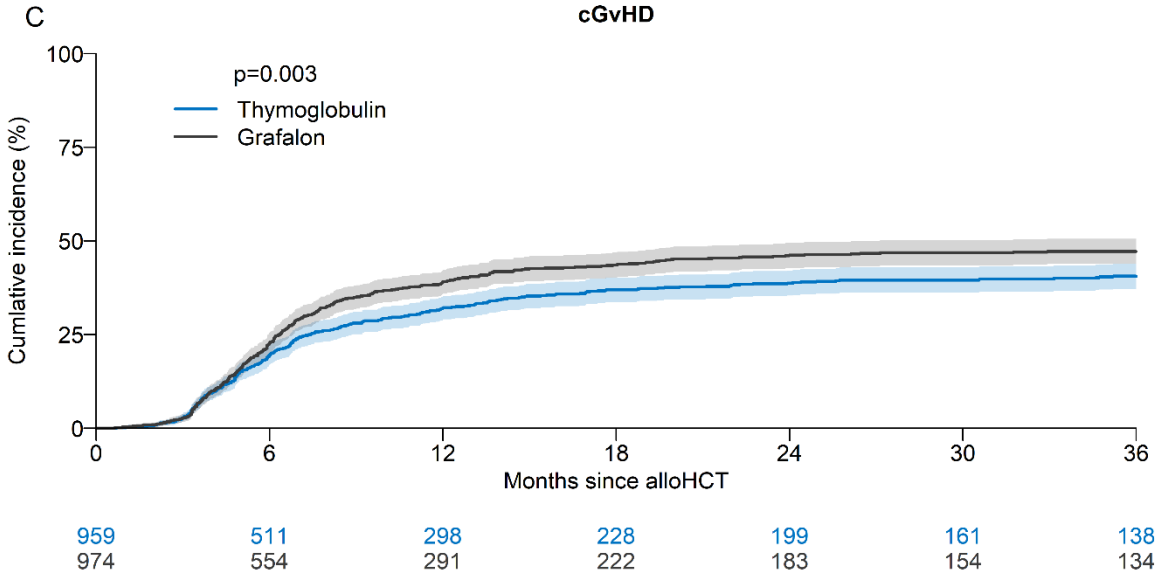

C
cGvHD
p=0.003
Thymoglobulin
Grafalon
Cumlative incidence (%)
100
75
50
25
0
0
6
12
18
24
30
36
Months since alloHCT
959 511 298 228 199 161 138
974 554 291 222 183 154 134

**Figure S3. Outcome of MF patients transplanted with either ATG or PTCY as GvHD prophylaxis.**

A) Overall survival (OS), B) progression free survival (PFS), C) Graft-vs-host disease-free relapse-free survival (GRFS), D) relapse incidence (RI) and E) non-relapse mortality (NRM) of myelofibrosis patients who received post-transplant cyclophosphamide (PTCY) or antithymocyteglobulin (ATG) as Graft-vs-host disease (GvHD) prophylaxis for unrelated donor (UD) allogeneic hematopoietic stem cell transplantation (allo-HCT) and stratified on donor type (matched unrelated donor (MUD) vs mismatched unrelated donor (MMUD)). Numbers below the graph show the number of patients at risk. Confidence intervals are represented by the shaded areas. P-values are calculated by the logrank and Gray tests where appropriate.

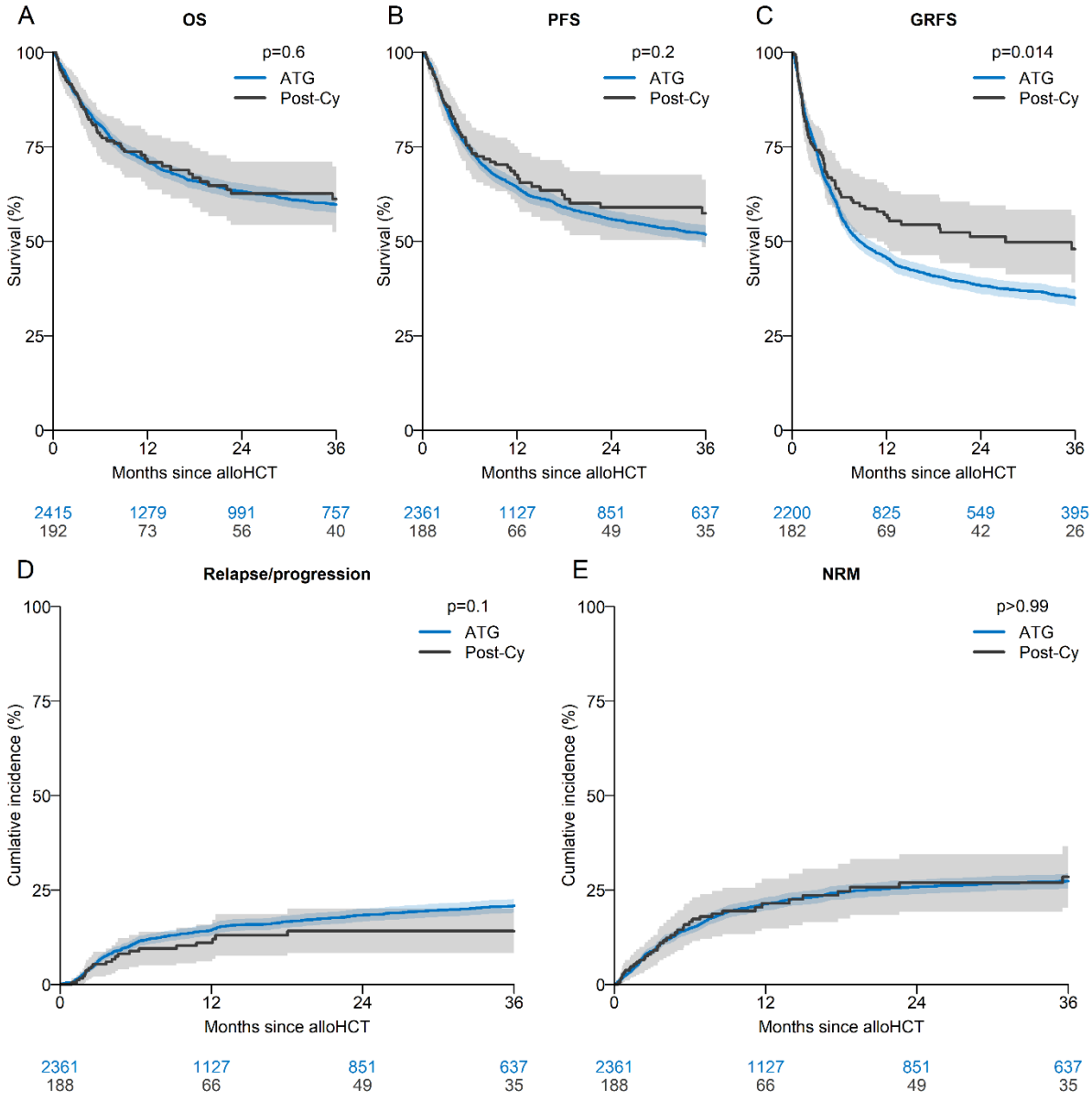
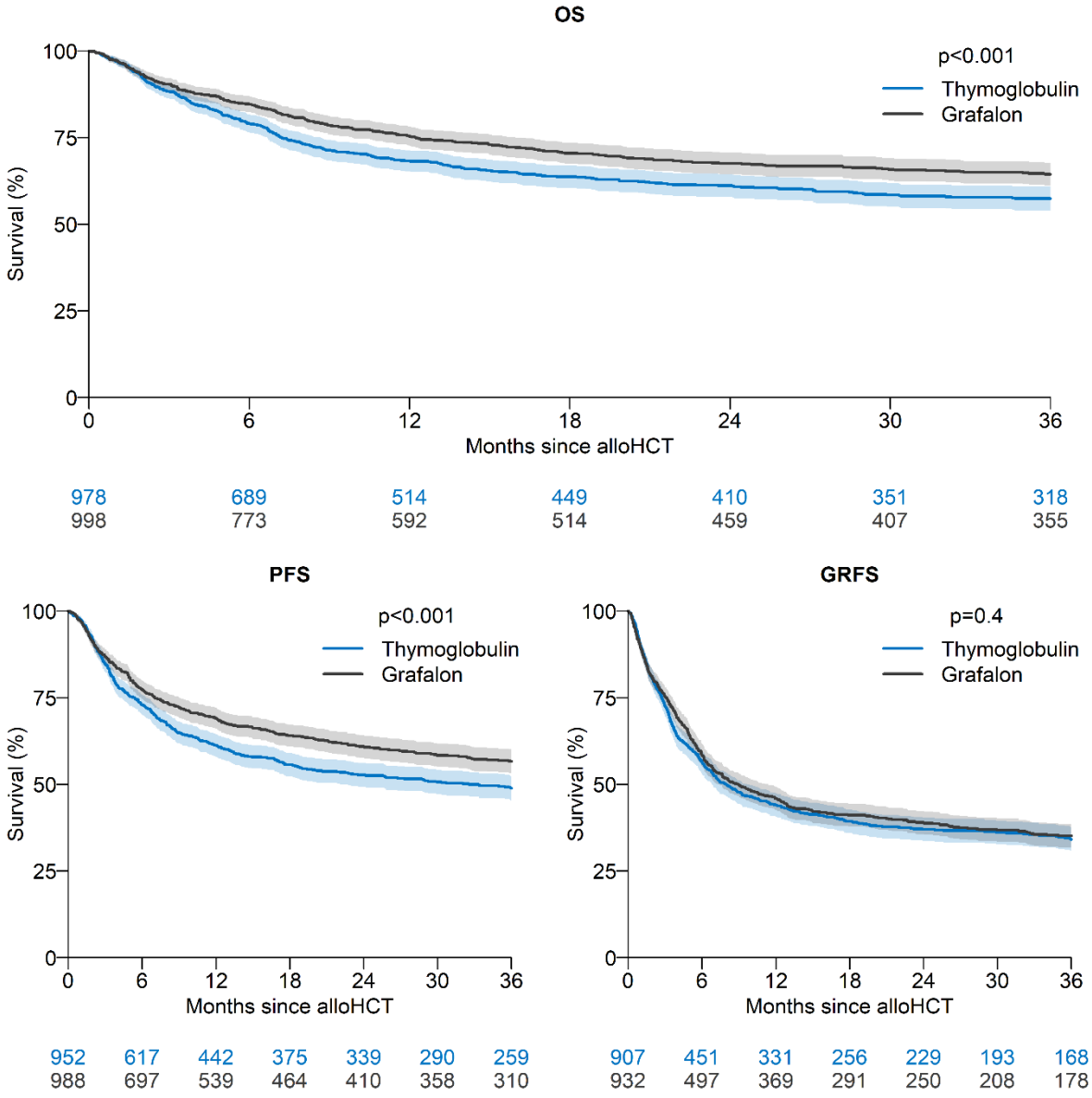

A
OS
p=0.6
ATG
Post-Cy
Survival (%)
100
75
50
25
0
0
12
24
36
Months since alloHCT
2415 1279 991 757
192 73 56 40
B
PFS
p=0.2
ATG
Post-Cy
Survival (%)
Months since alloHCT
2361 1127 851 637
188 66 49 35
C
GRFS
p=0.014
ATG
Post-Cy
Survival (%)
Months since alloHCT
2200 825 549 395
182 69 42 26
D
Relapse/progression
p=0.1
ATG
Post-Cy
Cumulative incidence (%)
Months since alloHCT
2361 1127 851 637
188 66 49 35
E
NRM
p>0.99
ATG
Post-Cy
Cumulative incidence (%)
Months since alloHCT
2361 1127 851 637
188 66 49 35

**Figure S4. Overall survival (OS), progression-free survival (PFS) and graft-versus-host-free relapse-free survival (GRFS) with Thymoglobulin® vs Grafalon®**

Numbers below the graph show the number of patients at risk. Confidence intervals are represented by the shaded areas. P-values are calculated by the logrank and Gray tests where appropriate.


OS
p<0.001
Thymoglobulin
Grafalon
Survival (%)
100
75
50
25
0
0
6
12
18
24
30
36
Months since alloHCT
978 689 514 449 410 351 318
998 773 592 514 459 407 355
PFS
p<0.001
Thymoglobulin
Grafalon
Survival (%)
Months since alloHCT
952 617 442 375 339 290 259
988 697 539 464 410 358 310
GRFS
p=0.4
Thymoglobulin
Grafalon
Survival (%)
Months since alloHCT
907 451 331 256 229 193 168
932 497 369 291 250 208 178

## Table S1. Patient characteristics

| Characteristic | Overall N = 2607 | PTCY N = 192 | ATG N = 2415 | p-value |
|---|---|---|---|---|
| **Median age (IQR)** | 61 [55, 65] | 60 [53, 64] | 61 [55, 65] | **0.031** |
| **Sex** | | | | 0.4 |
| **Male** | 1634 (63%) | 115 (60%) | 1519 (63%) | |
| **Female** | 973 (37%) | 77 (40%) | 896 (37%) | |
| **Recipient-donor CMV match** | | | | **<0.001** |
| **Pat -/Don -** | 843 (33%) | 33 (17%) | 810 (34%) | |
| **Pat -/Don +** | 208 (8.1%) | 19 (10%) | 189 (7.9%) | |
| **Pat +/Don -** | 555 (22%) | 71 (37%) | 484 (20%) | |
| **Pat +/Don +** | 964 (38%) | 67 (35%) | 897 (38%) | |
| **(Missing)** | 37 | 2 | 35 | |
| **Donor type** | | | | **<0.001** |
| **MUD** | 1790 (78%) | 110 (60%) | 1680 (79%) | |
| **MMUD** | 515 (22%) | 74 (40%) | 441 (21%) | |
| **(Missing)** | 302 | 8 | 294 | |
| **DIPSS Risk group (at alloHCT)** | | | | **0.037** |
| **Low risk (0 score points)** | 32 (1.9%) | 3 (2.0%) | 29 (1.8%) | |
| **Low-intermediate risk (1-2)** | 685 (40%) | 75 (51%) | 610 (39%) | |
| **High-intermediate risk (3-4)** | 633 (37%) | 44 (30%) | 589 (37%) | |
| **High risk (5-6)** | 376 (22%) | 26 (18%) | 350 (22%) | |
| **(Missing)** | 881 | 44 | 837 | |
| **IPSS Risk group (at diagnosis)** | | | | 0.5 |
| **Low risk (0 score points)** | 131 (10%) | 12 (12%) | 119 (10%) | |
| **Low-intermediate risk (1)** | 276 (22%) | 19 (19%) | 257 (22%) | |
| **High-intermediate risk (2)** | 571 (45%) | 49 (50%) | 522 (44%) | |
| **High risk (3)** | 301 (24%) | 18 (18%) | 283 (24%) | |
| **(Missing)** | 1328 | 94 | 1234 | |
| **HCT-CI** | | | | **0.066** |
| **low risk (0)** | 1152 (51%) | 79 (43%) | 1073 (51%) | |
| **intermediate risk (1-2)** | 568 (25%) | 51 (28%) | 517 (25%) | |
| **high risk (>= 3)** | 554 (24%) | 55 (30%) | 499 (24%) | |
| **(Missing)** | 333 | 7 | 326 | |
| **KPS** | | | | **0.005** |

| | | | | |
|---|---|---|---|---|
| **≥90** | 1613 (65%) | 138 (73%) | 1475 (64%) | |
| **80** | 708 (29%) | 35 (19%) | 673 (29%) | |
| **<80** | 156 (6.3%) | 16 (8.5%) | 140 (6.1%) | |
| **(Missing)** | 130 | 3 | 127 | |
| **Recipient-donor sex match** | | | | 0.8 |
| **Don M->Pat M** | 1305 (51%) | 92 (48%) | 1213 (51%) | |
| **Don F->Pat M** | 301 (12%) | 23 (12%) | 278 (12%) | |
| **Don M->Pat F** | 624 (24%) | 50 (26%) | 574 (24%) | |
| **Don F->Pat F** | 333 (13%) | 27 (14%) | 306 (13%) | |
| **(Missing)** | 44 | 0 | 44 | |
| **Graft source** | | | | >0.9 |
| **BM** | 92 (3.5%) | 7 (3.6%) | 85 (3.5%) | |
| **PB** | 2515 (96%) | 185 (96%) | 2330 (96%) | |
| **Conditioning regimen** | | | | 0.071 |
| **MAC** | 912 (36%) | 56 (29%) | 856 (36%) | |
| **RIC** | 1656 (64%) | 134 (71%) | 1522 (64%) | |
| **(Missing)** | 39 | 2 | 37 | |
| **Transplant year** | | | | **<0.001** |
| **2012-2014** | 497 (19%) | 3 (1.6%) | 494 (20%) | |
| **2015-2016** | 414 (16%) | 14 (7.3%) | 400 (17%) | |
| **2017-2018** | 554 (21%) | 34 (18%) | 520 (22%) | |
| **2019-2020** | 578 (22%) | 61 (32%) | 517 (21%) | |
| **2021-2022** | 564 (22%) | 80 (42%) | 484 (20%) | |
| **Interval diagnosis-alloHCT (months)** | 33 [11, 107] | 44 [13, 111] | 32 [11, 107] | 0.061 |
| **Ruxolitinib used** | | | | 0.5 |
| **no** | 1003 (59%) | 54 (56%) | 949 (59%) | |
| **yes** | 702 (41%) | 43 (44%) | 659 (41%) | |
| **(Missing)** | 902 | 95 | 807 | |
| **Myelofibrosis type** | | | | 0.13 |
| **Primary MF** | 1850 (71%) | 127 (66%) | 1723 (71%) | |
| **Post-ET or post-PV** | 757 (29%) | 65 (34%) | 692 (29%) | |
| **GvHD prophylaxis** | | | | |
| **Calcineurin inhibitors** | | | | **<0.001** |

| | | | | |
|---|---|---|---|---|
| **Yes** | 2507 (97%) | 149 (78%) | 2358 (98%) | |
| **No** | 81 (3%) | 43 (22%) | 38 (2%) | |
| **Missing** | 19 (1%) | | 19 (1%) | |
| **Calcineurin inhibitors + MMF** | | | | **0.007** |
| **Yes** | 1272 (49%) | 113 (59%) | 1159 (48%) | |
| **No** | 1316 (51%) | 79 (41%) | 1237 (52%) | |
| **Missing** | 19 (1%) | | 19 (1%) | |
| **Calcineurin inhibitors + Methotrexate** | | | | **<0.001** |
| **Yes** | 1044 (40%) | 1 (1%) | 1043 (44%) | |
| **No** | 1544 (60%) | 191 (99%) | 1353 (56%) | |
| **Missing** | 19 (1%) | | 19 (1%) | |

IQR: interquartile range, PTCY: post-transplant cyclophosphamide, ATG: antithymocyte globulin, CMV: cytomegalovirus, Pat: patient, Don: donor, MUD: matched unrelated donor, MMUD: mismatched unrelated donor (defined as donors not matched 10/10), alloHCT: allogeneic hematopoietic stem cell transplantation, DIPSS: dynamic international prognostic scoring system, IPSS: international prognostic scoring system, HCT-CI: hematopoietic cell transplantation-specific comorbidity index, KPS: Karnofsky performance status, M: male, F: female, BM: bone marrow, PBSC: peripheral blood stem cell, MAC: myeloablative conditioning, RIC: reduced intensity conditioning, MF: myelofibrosis, ET: essential thrombocythemia, PV: polycythemia vera, MMF: mycophenolate mofetil.

**Table S2. Outcome of MF patients with unrelated donor transplants by donor type (univariable)**

| Variables | MUD N=1790 | MMUD N=515 | p-value |
|---|---|---|---|
| **3-year OS** | 61% (59-64%) | 55% (50-60%) | 0.015 |
| **3-year PFS** | 53% (51-56%) | 48% (43-53%) | 0.06 |
| **3-year relapse/progression** | 20% (18-22%) | 20% (16-24%) | 0.7 |
| **3-year NRM** | 27% (25-29%) | 31% (27-36%) | 0.07 |
| **D100 aGvHD (95% CI)** | | | |
| **aGvHD grade II-IV** | 30% (27-32%) | 35% (30-39%) | 0.032 |
| **aGvHD grade III-IV** | 14% (13-16%) | 16% (13-20%) | 0.17 |
| **3-year cGvHD (95% CI)** | | | |
| **All** | 42% (39-44%) | 44% (39-49%) | 0.6 |
| **Mild** | 14% (12-16%) | 12% (8-15%) | 0.3 |
| **Moderate** | 14% (12-16%) | 15% (12-19%) | 0.6 |
| **Severe /extensive** | 9% (8-11%) | 12% (8-15%) | 0.3 |
| **3-year cGvHD-free survival** | 28% (26-31%) | 21% (17-25%) | 0.001 |
| **3-years GRFS (95% CI)** | 38% (35-41%) | 28% (23-33%) | 0.002 |

MF: myelofibrosis, MUD: matched unrelated donor, MMUD: mismatched unrelated donor, D: day, CI: confidence interval, OS: overall survival, PFS: progression-free survival, NRM: non-relapse mortality, aGvHD: acute graft-versus-host disease, cGvHD: chronic graft-versus-host disease, GRFS: graft-versus-host disease-free relapse-free survival.

**Table S3. Multivariable Cox model for acute and chronic GvHD. Patient age at transplant is in decades. Effect estimates are given with 95% confidence intervals. Corresponding p-values are calculated using the Wald test.**

| | | aGvHD II-IV | | aGvHD III-IV | | cGvHD | | Severe cGvHD | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Group | HR (95% CI) | P | HR (95% CI) | p | HR (95% CI) | p | HR (95% CI) | p |
| Prophylaxis | ATG | | | | | | | | |
| | PTCY | 0.84 (0.59 - 1.19) | 0.325 | 0.91 (0.56 - 1.48) | 0.705 | 0.59 (0.4 - 0.87) | 0.008 | 0.38 (0.15 - 0.97) | 0.042 |
| Patient age (decades) | | 0.98 (0.88 - 1.08) | 0.645 | 1 (0.86 - 1.15) | 0.961 | 0.97 (0.88 - 1.07) | 0.542 | 0.94 (0.78 - 1.14) | 0.536 |
| DIPSS Risk group (at alloHCT) | Low-int (0-2) | | | | | | | | |
| | High-int(3-4) | 1.04 (0.81 - 1.32) | 0.771 | 0.89 (0.63 - 1.25) | 0.5 | 1.03 (0.84 - 1.28) | 0.755 | 1.3 (0.83 - 2.04) | 0.245 |
| | High (5-6) | 1.33 (1.02 - 1.74) | 0.036 | 1.35 (0.94 - 1.94) | 0.102 | 1.04 (0.8 - 1.34) | 0.781 | 1.38 (0.83 - 2.31) | 0.22 |
| | (Missing) | 1.18 (0.93 - 1.49) | 0.168 | 0.88 (0.62 - 1.23) | 0.449 | 1.13 (0.91 - 1.41) | 0.252 | 1.06 (0.66 - 1.69) | 0.815 |
| Donor type | MUD | | | | | | | | |
| | MMUD | 1.29 (1.06 - 1.57) | 0.011 | 1.29 (0.98 - 1.71) | 0.071 | 1.17 (0.97 - 1.41) | 0.1 | 1.24 (0.85 - 1.82) | 0.26 |
| HCT-CI | low risk (0) | | | | | | | | |
| | intermediate risk (1-2) | 1.06 (0.87 - 1.29) | 0.592 | 0.96 (0.72 - 1.28) | 0.776 | 1.05 (0.87 - 1.27) | 0.604 | 0.89 (0.59 - 1.33) | 0.561 |
| | high risk (>= 3) | 0.79 (0.63 - 0.99) | 0.036 | 0.79 (0.58 - 1.08) | 0.139 | 1.03 (0.85 - 1.26) | 0.74 | 1.09 (0.73 - 1.62) | 0.672 |
| Interval diagnosis-alloHCT (decades) | | 1.03 (0.91 - 1.18) | 0.621 | 1.21 (1.01 - 1.44) | 0.039 | 0.97 (0.85 - 1.1) | 0.61 | 0.95 (0.72 - 1.25) | 0.714 |
| Ruxolitinib used | no | | | | | | | | |
| | yes | 0.98 (0.8 - 1.21) | 0.86 | 1.1 (0.82 - 1.48) | 0.527 | 1.06 (0.88 - 1.27) | 0.531 | 1.19 (0.81 - 1.74) | 0.377 |
| | (Missing) | 1.04 (0.84 - 1.3) | 0.706 | 1.14 (0.83 - 1.57) | 0.41 | 1.03 (0.84 - 1.27) | 0.765 | 1.03 (0.66 - 1.58) | 0.911 |
| Conditioning regimen | standard | | | | | | | | |
| | reduced | 0.93 (0.77 - 1.14) | 0.494 | 0.92 (0.7 - 1.21) | 0.554 | 0.94 (0.79 - 1.13) | 0.509 | 0.96 (0.67 - 1.39) | 0.84 |
| Myelofibrosis type | Primary MF | | | | | | | | |
| | post-ET or PV MF | 1.22 (1 - 1.5) | 0.054 | 0.97 (0.72 - 1.3) | 0.834 | 1.04 (0.86 - 1.26) | 0.713 | 0.88 (0.58 - 1.32) | 0.536 |
| Transplant year | | 1 (0.97 - 1.03) | 0.896 | 0.99 (0.95 - 1.04) | 0.833 | 1.01 (0.98 - 1.04) | 0.438 | 0.98 (0.91 - 1.04) | 0.465 |
| Center effect | Variance | 0.28 | <0.001 | 0.38 | <0.001 | 0.17 | <0.001 | 0.55 | <0.001 |

PTCY: post-transplant cyclophosphamide, ATG: antithymocyte globulin, CI: confidence interval, OS: overall survival, PFS: progression-free survival, GRFS: graft-versus-host disease-free relapse-free survival, GvHD: graft-versus-host disease, DIPSS: dynamic international prognostic score system, MUD: matched unrelated donor, MMUD: mismatched unrelated donor, , allo-HCT: allogeneic hematopoietic cell transplantation, HCT-CI: hematopoietic cell transplantation comorbidity index, MAC: myeloablative conditioning, RIC: reduced intensity conditioning, MF: myelofibrosis.

**Table S4. Multivariable Cox model for OS, PFS, NRM, relapse and GRFS. Patient age at transplant is in decades. Effect estimates are given with 95% confidence intervals. Corresponding p-values are calculated using the Wald test.**

| | | OS | | PFS | | NRM | | Relapse/progression | | GRFS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Group** | **HR (95% CI)** | **p** | **HR (95% CI)** | **p** | **HR (95% CI)** | **p** | **HR (95% CI)** | **p** | **HR (95% CI)** | **p** |
| Prophylaxis | ATG | | | | | | | | | | |
| | PTCY | 0.84 (0.6 - 1.18) | 0.325 | 0.79 (0.58 - 1.08) | 0.138 | 0.89 (0.61 - 1.31) | 0.555 | 0.65 (0.39 - 1.09) | 0.1 | 0.72 (0.55 - 0.95) | 0.02 |
| Patient age (decades) | | 1.25 (1.13 - 1.38) | <0.001 | 1.18 (1.08 - 1.29) | <0.001 | 1.39 (1.23 - 1.57) | <0.001 | 0.95 (0.83 - 1.09) | 0.457 | 1.04 (0.96 - 1.12) | 0.323 |
| DIPSS Risk group (at alloHCT) | Low-int (0-2) | | | | | | | | | | |
| | High-int(3-4) | 1.1 (0.88 - 1.37) | 0.408 | 1.07 (0.88 - 1.3) | 0.523 | 1.01 (0.78 - 1.31) | 0.935 | 1.13 (0.83 - 1.53) | 0.436 | 1 (0.84 - 1.19) | 0.966 |
| | High (5-6) | 1.62 (1.28 - 2.05) | <0.001 | 1.29 (1.04 - 1.61) | 0.022 | 1.27 (0.96 - 1.68) | 0.095 | 1.3 (0.92 - 1.85) | 0.139 | 1.25 (1.03 - 1.52) | 0.024 |
| | (Missing) | 1.16 (0.93 - 1.44) | 0.197 | 0.92 (0.75 - 1.13) | 0.438 | 0.92 (0.71 - 1.2) | 0.559 | 0.92 (0.67 - 1.26) | 0.594 | 0.98 (0.82 - 1.17) | 0.808 |
| Donor type | MUD | | | | | | | | | | |
| | MMUD | 1.36 (1.14 - 1.62) | 0.001 | 1.27 (1.07 - 1.49) | 0.005 | 1.39 (1.13 - 1.72) | 0.002 | 1.1 (0.85 - 1.44) | 0.457 | 1.31 (1.13 - 1.51) | <0.001 |
| HCT-CI | low risk (0) | | | | | | | | | | |
| | intermediate risk (1-2) | 1.22 (1 - 1.47) | 0.045 | 1.12 (0.94 - 1.33) | 0.212 | 1.21 (0.97 - 1.52) | 0.096 | 0.98 (0.74 - 1.29) | 0.86 | 1.05 (0.91 - 1.22) | 0.5 |
| | high risk (>= 3) | 1.49 (1.24 - 1.8) | <0.001 | 1.34 (1.13 - 1.59) | 0.001 | 1.44 (1.15 - 1.8) | 0.002 | 1.21 (0.93 - 1.59) | 0.16 | 1.13 (0.97 - 1.32) | 0.118 |
| Interval diagnosis-alloHCT (decades) | | 1.14 (1.01 - 1.28) | 0.031 | 1.14 (1.02 - 1.27) | 0.022 | 1.22 (1.06 - 1.4) | 0.005 | 1.01 (0.85 - 1.21) | 0.889 | 1.16 (1.06 - 1.28) | 0.002 |
| Ruxolitinib used | no | | | | | | | | | | |
| | yes | 0.95 (0.79 - 1.14) | 0.583 | 0.99 (0.84 - 1.18) | 0.94 | 0.97 (0.77 - 1.21) | 0.768 | 1.03 (0.79 - 1.35) | 0.842 | 1.05 (0.91 - 1.22) | 0.511 |
| | (Missing) | 1 (0.82 - 1.22) | 0.999 | 1.1 (0.92 - 1.32) | 0.291 | 0.98 (0.77 - 1.24) | 0.861 | 1.29 (0.98 - 1.71) | 0.069 | 1.08 (0.92 - 1.27) | 0.357 |
| Conditioning regimen | standard | | | | | | | | | | |
| | reduced | 1.04 (0.87 - 1.24) | 0.681 | 0.99 (0.84 - 1.16) | 0.87 | 0.9 (0.73 - 1.11) | 0.328 | 1.14 (0.89 - 1.47) | 0.292 | 1.03 (0.89 - 1.18) | 0.709 |
| Myelofibrosis type | Primary MF | | | | | | | | | | |
| | post-ET or PV MF | 0.9 (0.74 - 1.09) | 0.263 | 0.96 (0.81 - 1.15) | 0.691 | 0.79 (0.63 - 1) | 0.053 | 1.27 (0.97 - 1.66) | 0.086 | 0.94 (0.8 - 1.09) | 0.416 |
| Transplant year | | 0.99 (0.96 - 1.02) | 0.626 | 0.98 (0.95 - 1.01) | 0.168 | 0.99 (0.95 - 1.02) | 0.438 | 0.97 (0.93 - 1.02) | 0.268 | 0.99 (0.97 - 1.02) | 0.681 |
| Center effect | Variance | 0.16 | <0.001 | 0.09 | <0.001 | 0.18 | <0.001 | 0.12 | <0.001 | 0.08 | <0.001 |

PTCY: post-transplant cyclophosphamide, ATG: antithymocyte globulin, CI: confidence interval, OS: overall survival, PFS: progression-free survival, GRFS: graft-versus-host disease-free relapse-free survival, GvHD: graft-versus-host disease, DIPSS: dynamic international prognostic score system, MUD: matched unrelated

142 donor, MMUD: mismatched unrelated donor, HSCT: hematopoietic stem cell transplantation, alloHSCT: allogeneic hematopoietic stem cell transplantation, HCT-
143 CI: hematopoietic cell transplantation comorbidity index, MAC: myeloablative conditioning, RIC: reduced intensity conditioning, MF: myelofibrosis.
144

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