Rapid Engraftment, Immune Recovery, and Resolution of Transfusion Dependence in Treatment-Refractory Severe Aplastic Anemia Following Transplantation with Ex Vivo Expanded Umbilical Cord Blood (Omidubicel)

Mohamed Samour, MD, Georg Aue, MD, PhD, Joseph Clara, MD, Jennifer Wilder, Robert Reger, MS, Rosa Nadal Rios, MD, Kate Stringaris, MD, PhD, Brian Wells, Lisa Cook, Kristen Gunn, Reem A Shalabi, PharmD, Josef Rivero, Patricia Prince, David F. Stroncek, MD, Willy A. Flegel, MD, Xin Tian, PhD and Richard W. Childs, MD

Mohamed Samour, MD
National Institutes of Health, Bethesda, MD

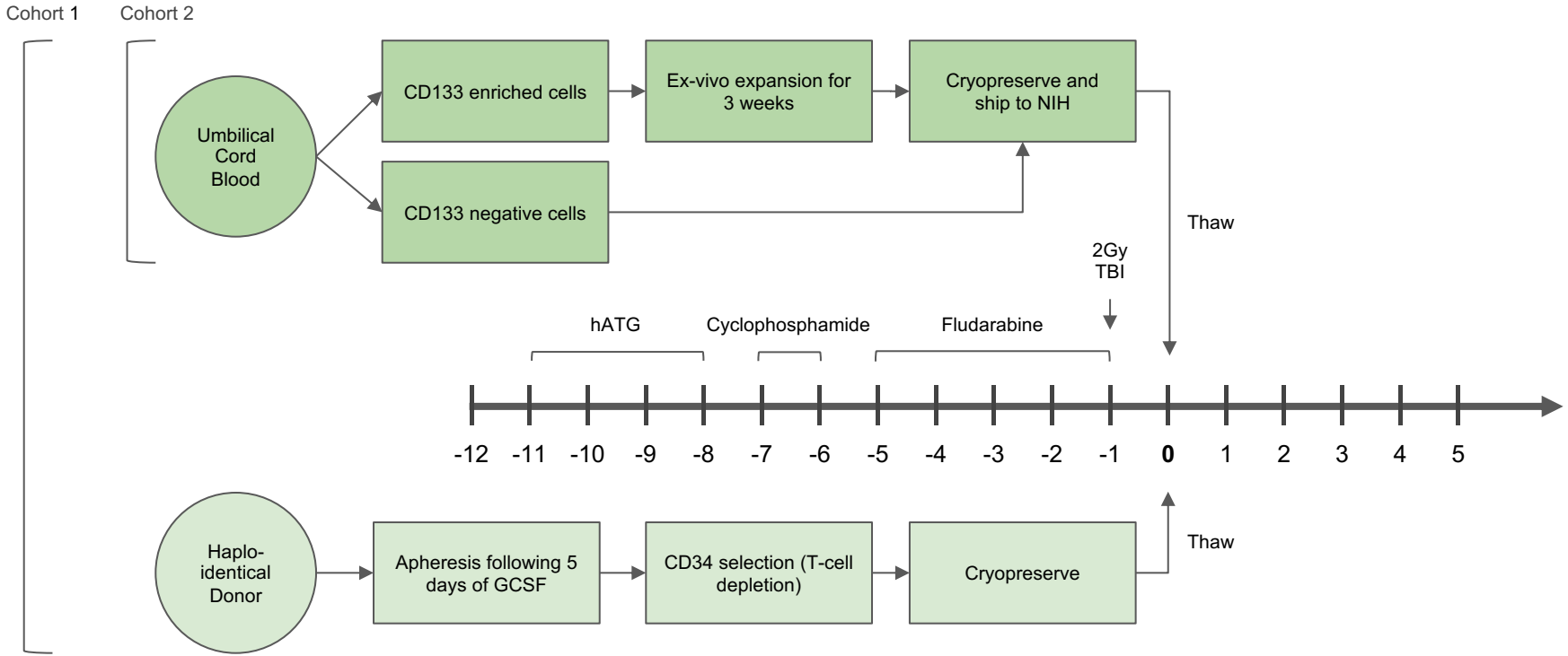
Disclosures

No Disclosures

Severe Aplastic Anemia (SAA)

- SAA is a life-threatening bone marrow failure disorder
- Long term survival for SAA patients can be achieved with immunosuppressive therapy (IST), but refractory disease and relapses are common
- Allogeneic stem cell transplantation is a viable option for refractory patients but many patients lack an HLA-matched donor
- Umbilical cord blood transplantation is associated with delayed engraftment and high rejection rates

Study Design: Schema



Study Design: Eligibility

- Patients 4 to 55 years of age with a diagnosis of transfusion dependent SAA or hypoplastic MDS
- Failure or intolerance to IST
- Lack of an HLA-matched donor
- Patients must have a ≥ 4/8 HLA matched UCB unit with a minimum of 1.8 x 10^9 and at least 1.8x10^7 /kg TNCs and at least 8 x 10^6 CD34+ cells
- Absence of donor specific antibodies to mismatched alleles on the UCB unit

Results

	ID	Age	Sex	Prior Therapy	CMV/EBV Status (IgG)	ABO Mismatch	aGVHD (≥grade 2)	cGVHD	CMV Reactivation	Transfusion Independence	Time From Transplant
Cohort 1	1	22	M	IST + EPAG	+/+	Major	No	No	Yes	Yes	3.2 y
	2	45	F	IST + EPAG	+/+	Major	No	No	Yes	Yes	2.7 y
	3	22	F	IST + EPAG	+/+	None	No	No	No	Yes	2.1 y
Cohort 2	4	27	M	IST + EPAG	-/+	Bidirectional	No	No	No	Yes	1.4 y
	5	24	F	IST + EPAG	+/+	None	No	No	Yes	Yes	1.3 y
	6	6	M	IST + EPAG	+/+	Major	No	N/E	No	N/E	1.2 y
	7	27	M	IST + EPAG	+/+	Bidirectional	Yes	N/E	No	N/E	1.1 y
	8	17	M	IST + EPAG	-/+	None	No	No	No	Yes	5 m
	9	38	M	IST + EPAG	+/+	Minor	N/E	N/E	No	N/E	1 m

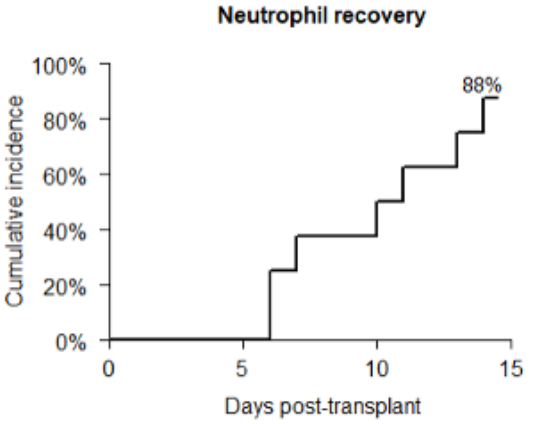
EPAG: Eltrombopag, N/E: not evaluable

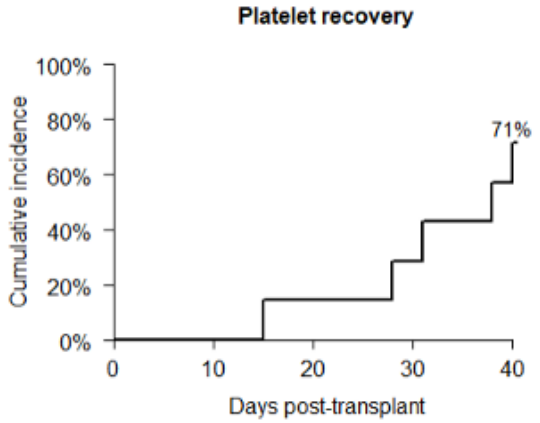
Results: Summary

- No acute grade ≥2 GVHD (except patient #7)
- No chronic GVHD
- CMV reactivation seen in 3 patients (42.8% of patients at risk)
- 1 death related to disseminated adenovirus infection
- 1 rejection in cohort 2 followed by a successful haploidentical transplant

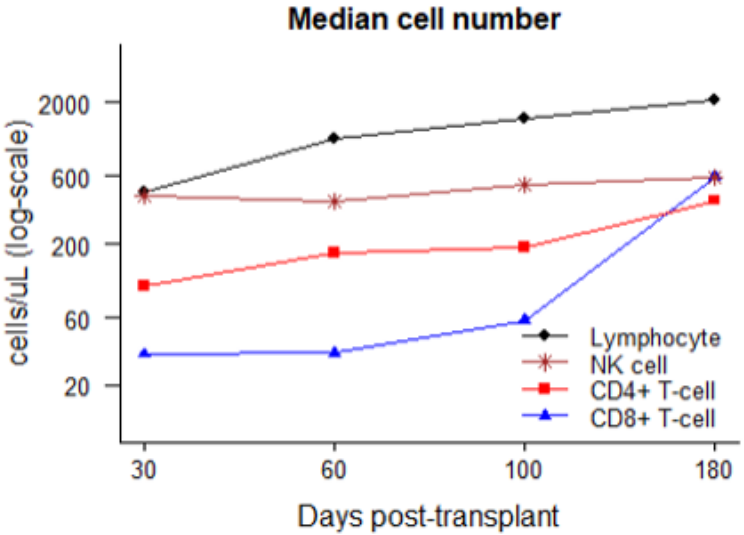
Results: Summary

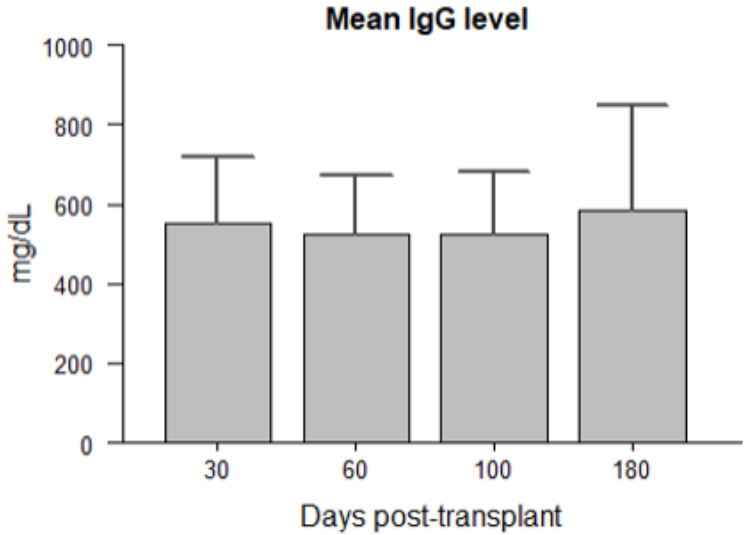
- A total of 7 of 8 (88%) patients achieved early and sustained cord engraftment
- Brisk neutrophil and platelet recovery occurring at a median of 10 days (range 6-14) and 31 days (15-40) respectively
- Chimerism data shows 6 patients had > 95% myeloid by D+14 and >95% T-cell by D+26





Results


Median cell number
cells/uL (log-scale)
2000
600
200
60
20
30
60
100
180
Days post-transplant
Lymphocyte
NK cell
CD4+ T-cell
CD8+ T-cell


Mean IgG level
mg/dL
1000
800
600
400
200
0
30
60
100
180
Days post-transplant