Figure legend:

Figure.1:

The TRECs of health children aged from 0-18y.

DNA from peripheral blood of health children aged from 0-18 years old was extracted and used to analyzed the TRECs by RT-qPCR.

We divided the health control into seven different age groups (0-1m, 1m-6m, 6m-1y, 1-4y, 4-8y, 8-12y, 12-18y), the TRECs level of 410 healthy children was decreased with age.

Figure.2:

The TRECs level was no difference in female and male.

The Higher levels of TRECs were detected in females than males before 1-year old, but the differences were not statistically significant, after 1-year-old, the TRECs levels in female were similar to male.

Figure.3:

The influence of gestational age and birth weight on TRECs.

The DNA was extracted from dry blood pot of newborns, the TRECs was analyzed.

A. The TRECs of different gestational aged and birth weighted newborns.
B. The TRECs of preterm newborn was lower than full terms.
C. In Full term newborns, the TRECs of low birth weight was lower than normal birth weight.
D. In preterm newborns, the TRECs of low birth weight was comparable to normal birth weight.

Figure.4:

The correlation of T cell subsets and TRECs level.

A: There was a minor correlation between TRECs and T cells absolute number.

B&C: There was a low correlation between TRECs and CD4+/CD4+ Naive T cells absolute number.

D&E: There was no correlation between CD8+/CD8+ Naive T cells absolute number.

F&H&G: There was no correlation between CD4+/CD8+ centra memory(CM)/ CD8 effector memory(EM) T cells absolute number and TRECs.

I: There was a minor correlation between TRECs and CD4/CD8 effector memory(EM) T cells absolute number.

Figure.5:

The correlation of TRECs and CD4+Naïve T cells in different age group was analyzed.

A&B&C&F&G: There were no correlation between TRECs and CD4 Naïve T cell in theses age groups.

D&E: There were significant correlations between TRECs and CD4 Naïve T cell in children aged 1y-4y and 4y-8y.

Figure.6:

The TRECs copies in different PIDs.

The qRT-PCR was used to analyzed the TRECs of peripheral blood DNA in different PIDs, including XLA/SCID/CMCD/MSMD/APDS/WAS/XLT patients.

Figure.7:

The TRECs level and CD4 Naïve T cells absolute number of STAT1 patients.

The TRECs level of P11/P13/P14/P15 were decreased while the TRECs of P16/P17/P18 were in the normal range, that was consistent to their change of CD4 Naïve T cells absolute number

Figure.8:

The TRECs level of nephrotic syndrome(NS) patients with or without prednisone treatment.

The TRECs level of NS patients with or without prednisone treatment were in normal range

Figure.9:

TRECs monitoring T cell reconstitution after HSCT.

We followed up the TRECs level of 5 WAS and 2 CGD after HSCT.

The TRECs of P1/P3/P4/P7 were started to rise at 4 weeks and got into normal range in 1 year. For P2/P5/P6, the TRECs were remain unchanged.

Table 1:

The TRECs of health children aged from 0-18y

Age group	Total number	TRECs (copies/10`5 cells)
0-1m	11	2927.0±534.70
1-6m	64	2922.0±221.00
6m-1y	54	2058.0±166.40
1y-4y	92	1443.0±102.70
4y-8y	88	1174.0±82.94
8y-12y	44	991.3±149.00
12y-18y	57	445.7±43.58

Table 2:

The TRECs copies in different PIDs.

Patient	Disease	Gene mutation	Age	TRECs (copies/10`5 cells)
P1	SCID	IL2rg	20d	0
P2	SCID	IL2rg	2m	0
P3	SCID	IL2rg	14d	236
P4	SCID	Lig4	1y6m	30.8
P5	SCID	JAK3	4m	0
P6	SCID	RAG1	2y1m	81.2
P7	SCID	RAG1	1y	0
P8	XLA	BTK	5y	2000
P9	XLA	BTK	10y	1004
P10	XLA	BTK	1y5m	1404
P11	CMCD	STAT1	4y6m	160
P12	MSMD	STAT1	4m7d	360
P13	CMCD	STAT1	15y	114
P14	CMCD	STAT1	5y	228
P15	CMCD	STAT1	4y8m	660
P16	CMCD	STAT1	9y1m	1712
P17	CMCD	STAT1	1y2m	2431.6
P18	MSMD	STAT1	6m29d	3280

P19	APDS	PIK3CD	9y	3.8
P20	APDS	PIK3CD	9y	156
P21	APDS	PIK3CD	5y	48
P22	APDS	PIK3CD	2y	556
P23	APDS	PIK3CD	18y	100
P24	XLT	WAS	10y	504
P25	XLT	WAS	6y2m	660
P26	XLT	WAS	11m	2512
P27	XLT	WAS	1y6m	1484
P28	XLT	WAS	7m	1380
P29	XLT	WAS	2y	1611
P30	XLT	WAS	1y5m	1321
P31	XLT	WAS	8y	438
P32	WAS	WAS	19d	332
P33	WAS	WAS	3m	1236
P34	WAS	WAS	15d	59.6
P35	WAS	WAS	1y	169.2
P36	WAS	WAS	2m	960
P37	WAS	WAS	4m	1028
P38	WAS	WAS	3m	1160
P39	WAS	WAS	1y	524
P40	WAS	WAS	9m	664
P41	WAS	WAS	5y2m	72.8
P42	WAS	WAS	1y1m	592
P43	WAS	WAS	5m	200
P44	WAS	WAS	1y	136.4
P45	WAS	WAS	4m	344

Table 3:
The CD4 naïve T cells absolute number of STAT1 patients

	P11	**P13**	**P14**	**P15**	**P16**	**P17**	**P18**
CD4 naive (cells/ul)	103.50	66.50	402.5	106.08	620.99	664.10	1108.30
TRECs(copies/ 10^5 cells)	160	114	228	660	1712	2431.6	3280

Table 4:

The TRECs level of nephrotic syndrome(NS) patients with or without prednisone treatment.

Patient	Sex	Age(y)	Prednisone	TRECs (copies/10`5 cells)
P1	Male	2	No	2080
P2	Male	15	No	750
P3	Male	10	No	520
P4	Male	8	No	1864
P5	Male	2	No	2571
P6	Male	11	Regularly	644
P7	Male	2	Regularly	2844
P8	Male	5	Regularly	1280
P9	Male	3	Regularly	1740
P10	Male	6	Regularly	1520

Table 5:
The characteristic of patients accept HSCT

Patient	Disease	Age of accept Trans-plantation	Donor	HLA matches	Conditioning regimen	Implantation rate	GVHD	Others after HSCT
P1	WAS	1y4m	Unrelated cord blood units	Mismatched	BU+CY	D45 100%	skin	indirect coombs test +
P2	WAS	1y6m	Maternal peripheral Blood stem cell	Mismatched	BU+CY	D29 100%	liver, eye CNS	-
P3	WAS	1y6m	Brother's BMSC	Mismatched	BU+CY	D55 39.9%	skin, intestine	drugs liver lesion, indirect coombs test +
P4	WAS	1y6m	Unrelated cord blood units	Mismatched	BU+CY	D28 100%	skin	mycoardial lesion, autoimmune hemolytic anemia
P5	WAS	1y6m	Sister's BMSC	Matched	BU+CY	D48 100%	intestine	MODS, autoimmune hemolytic anemia
P6	CGD	1y9m	Sister's BMSC	Matched	BU+CY	D45 100%	skin, intestine	Drug-induced liver and kidney damage
P7	CGD	2y11m	Unrelated cord blood units	Mismatched	BU+CY+ATG	D33 100%	intestine	-

BMSC: Bone Marrow Stem Cell
CNS: Central Nervous System

MODS: Multiple organ dysfunction