Supplemental Data

Patients with *CD3G* mutations reveal a role for human CD3 γ in T_{reg} diversity and suppressive function

Jared H. Rowe, Ottavia M. Delmonte, Sevgi Keles, Brian D. Stadinski, Adam K. Dobbs, Lauren A. Henderson, Yasuhiro Yamazaki, Luis M. Allende, Francisco A Bonilla, Luis I. Gonzalez-Granado, Seyma Celikbilek Celik, Sukru N. Guner, Hasan Kapakli, Christina Yee, Sung-Yun Pai, Eric S. Huseby, Ismail Reisli, Jose R. Regueiro, and Luigi D. Notarangelo.

Patient #	Autoimmune manifestation	Age at onset	Treatment	Age at the time of the study	Outcome	Current age (years)
P1	Enteropathy AIHA GLILD	15 months 21 months 21 months	Rituximab, sirolimus	27 months	MUD-HSCT at 32 months, deceased at 47 months (GvHD, infections)	N/A
P2	Subclinical hypothyroidism (positive TG and TPO Ab)	11 years	none	19 years	Actively followed, no treatment needed	20
P3	Hypothyroidism	5 years	Thyroid hormone replacement	6 years	Still under hormone replacement therapy	7
P4	Evans syndrome Autoimmune hepatitis Nephropathy ALPS	12 months 5 years 5 years 12 years	Steroids, cyclosporine A, high dose IVIG	15 years	Multiple relapses of Evans syndrome, persistent hepatomegaly and splenomegaly	18
P5	Hypothyroidism	10 years	Thyroid hormone replacement	23 years	Still under hormone replacement therapy	24
P6	Vitiligo Subclinical hypothyroidism (positive TG and TPO Ab)	12 months 18 years	none	34 years	Actively followed, no treatment needed	36

Table S1 – Characteristics of autoimmunity in CD3G-mutated patients

Ab, antibody; AIHA, autoimmune hemolytic anemia; ALPS, autoimmune lymphoproliferative syndrome; GLILD, granulomatous lymphocytic interstitial lung disease; GvHD, graft versus host disease; IVIG, intravenous immunoglobulins; MUD-HSCT, hematopoietic stem cell transplantation from a matched unrelated donor; TG, thyroglobulin; TPO, thyroid peroxidase

N/A: not applicable

Figure S1 - **High throughput sequencing analysis of** *TRB* repertoire in CD4⁺ T_{conv}, CD4⁺ T_{reg}, and CD8⁺ T cell subsets. Heat maps showing $V\beta$ and $J\beta$ pairing in unique *TRB* reads of CD4⁺ T_{conv} (top), CD4⁺ T_{reg} (middle) or CD8⁺ T cells (bottom) from all controls and all *CD3G*-mutated patients included in the study.

	C1	C2	C3	C4	C5	C6	C7	C8	P1	P2	P3	P4	P5	P6
CD4+T	4 2010/00	ernerol prrecipieres prrecipieres prrecipieres precipi	Canado Ca		Areadore CORLOP CORL	Accession Accession	CORLOS CORLOS CORLOS CORLOS CORLOS CORLOS CORLOS CORLOS CORLOS CORLOS			Annesi Anne				
CD4 I conv	-	-	-			-	Nillian av		Statistics.	-	-	-	-	
						-	4.100.00	-		-			10-100 k Z	TCR8V04-02 TCR8V04-02 TCR8V04-02 TCR8V04-02 TCR8V04-02 TCR8V04-02 TCR8V04-02
	man and	121704111	100001	BURNING.	B-045+1	1000010	121011	PROFES	Brifte H	PREM	1-1-11-11	22世世	-	TCREVOT40 TCREVO642 TCREVO642 TCREVO641 TCREV0641 TCREV11-01
	20001	ing in 12	Distance of	Science in a	Sector 1 i	increased.	249-1	-	1000	1.0254	5-1211	E-STREET	507515	TCREV12-61 TCREV10-62 TCREV10-62 TCREV12-62 TCREV12-62 TCREV12-62 TCREV05-66 TCREV05-66
	Biant P	0000000	Barren 11	100000000	distant of	Bialds Fil	100000000	Balant PE	1000	10.000	10.00	1.010	Route at	1038/00-04 1034/04-05 1034/04-05 1034/04-05 1034/04-05 1034/04-07
	Distant Res	Report to a local	100.00		100,0010	Carte	25.275		12 and	2000	1000	1221	Contraction in the	TCREWGE of TCREWGE of TCREWGE of TCREWGE of TCREWGE of TCREWGE of
	E	TOR I	CHI		1311	調問			新期	日期	后期	5.83	CHI.	17038900-00 17038907-59 1703891-543 17039
	1201	Berger of	-	B.000	B1997514	-	STREET.	Roserts.	東西部門	8-997	Roman and	机合物的	STREET.	TCHIWITHA TCHIWIHAA TCHIWIHAA TCHIWIAAA TCHIW20AH TCHIW20AH TCHIW20AH
	BOARD CO.	Manager and	100.001.00	Million and	Manager and	And in case of the	MARCH A	Manager of Parameters of Param	Print, N. Links	111110-011	10.1 10.01	101 1010	STREET,	TCRBV23-01 TCRBV25-01 TCRBV25-01 TCRBV25-01 TCRBV25-01 TCRBV25-01
CD4+T	STATES OF TAXABLE PARTY.	HICKS'S	STATES.	100000	COLUMN 1	STREET, ST	Concession of the	1000000000	101000	DOLLARS.		0.10010	The second second	TCRIV29-31 TCRIV20-31
CD4 [°] I _{reg}					-	-		-	6 days	B-Sizeffet	N.L. BARNE	1.000	BURN	TORINOL 41 TORINOL 41 TORINOL 41 TORINOL 41 TORINOL 41 TORINOL 41 TORINOL 41 TORINOL 41 TORINOL 41
	20120-00	N.CHILL		1202311		300010	Rosers.	7-2-3		1 intel	1.100	1.6.13	append.	TCREVOLOT TCREVOLOZ TCREVOLOZ TCREVOLOZ TCREVOLOZ TCREVOLOZ
	To state	1.10114	ET BALL	ti interi	miles to	e-184.00	BARKER	(के जाते	1.1	PBN	i. Spine	e leta	0.172	TORIVOR-00 TORIVOR-00 TORIVOR-00 TORIVOR-00 TORIVOR-00 TORIVOR-00 TORIVOR-00 TORIVOR-00
	125	pinter (50511	1011	Sec. 1	testa 1	10000	Internet of	5 4.5	1000	2,23	5,25	두 2011년	TOREVISE TOREVISE TOREVISE TOREVISE TOREVISE TOREVISE TOREVISE TOREVISE
	Contraction of the	Printer of	212212	minter:	States and	A	States of	and the second s	** <u>7</u> **	7777	516.6	1.22	States of the	TCREVES SH TCREVES SH TCREVES SS TCREVES SS TCREVES SS TCREVES SS TCREVES SS
		1.0.00	10.010	Qu. 101	C. State	122.0	1224.43	112.2		3.53	Same	1. 1.	1	TCREVOLOGI TCREVOLOGI TCREVOLOGI TCREVOLOGI TCREVOLOGI TCREVOLOGI
	朝			同時	5.1			調相	1.77	時時	局时	京開	使制	
	1201	MILLION I	1000	B-100 13	10001	WORKS	100000	10700	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	FCER	1000	F150	FOR STATE	TOREWISH TOREWISH TOREWISH TOREWISH TOREWISH TOREWISH TOREWISH TOREWISH
	Bald, etc.	Marganian Street	NAME OF TAXABLE PARTY.	10.00.014	and the second second	NAMES OF TAXABLE PARTY.	1000030	A solution		10,210	11111	1.000	100° 411	TORW2341 TORW2341 TORW2941 TORW2941 TORW2941 TORW2941
	Receipter a	Real Property lies	C	08+ T colle	100000			all the set	-	C. A. BLAN			10.101-00	TOREV29-01 TOREV29-01 TOREV29-01
				Jo I Cells	B.CHIFT.	REALIZ		E-08044	BEAD	STATUS.	82.000	1.000	SCHOOL SE	TOREVOSAL TOREVOSAL TOREVOSAL TOREVOSAL TOREVOSAL
	TCRB	V-J pairs			4-0-01	arrest in		Minister We	1 2 10	statistics.	1	4 Barro	Second.	1098/004/02 1098/004/02 1098/004/02 1098/004/02 1098/004/02 1098/004/02 1098/004/02
	Percent un	ique NGS read	s		Barlef be	PO-ST-1	Enited 14	0-DIT	5 2.	1.04	PORT	e leta	COT PR	TC/BV0743 TC/BV0642 TC/BV0642 TC/BV0643 TC/BV0643 TC/BV0643 TC/BV0643 TC/BV0643
	0	1	>3		1000	10000	model and	Brannin .	制度量	E-Intel	6.27	E. The	1.100	TCRIW12-31 TCRIW12-32 TCRIW11-32 TCRIW11-32 TCRIW11-32 TCRIW12-32 TCRIW0-35
	J gene	9 5'->3'			E COLUMN ST	0.000	BORD T	23834	11011	1100	Statistics of the	10.00	al supervision terretaria	TOREVOS 44 TOREVOS 44 TOREVOS 45 TOREVOS 45 TOREVOS 45 TOREVOS 47
	lene				2.212	And the local division of the	Collins and	-	Sec. 3	10224	2.711	1.24	d column	TCREV06-08 TCREV06-08 TCREV06-08 TCREV06-08 TCREV06-09 TCREV06-09
	5'->3'								राषण	日期	CIN	हे.हम	同調	TCHW05-0 TCHW05-0 TCHW05-0 TCHW05-0 TCHW05-0 TCHW05-0 TCHW07-0 TCH
	¥				REP.15	Product of	and the second s	82.0.0	8	1,111	11111	FIRM	1-nd	TCRIVID-01 TCRIVID-01 TCRIVID-01 TCRIVID-01 TCRIVID-01 TCRIVID-01 TCRIVID-01
					Distant of	Bergers.	BURGER PR	10.000.00		BARBON OF	in street		RI-GROUP	TCHBV25-01 TCHBV25-01 TCHBV25-01 TCHBV25-01 TCHBV25-01 TCHBV27-01 TCHBV27-01 TCHBV27-01 TCHBV27-01 TCHBV27-01 TCHBV27-01 TCHBV27-01



Figure S2 – Overlay of expression of CTLA-4, HELIOS, and ICOS on CD4⁺ FOXP3⁻ T conventional (T_{conv}) cells (blue) and CD4⁺ FOXP3⁺ regulatory T (T_{reg}) cells (red) from controls (C1-C4) and patients (P2-P5). Results demonstrate that T_{reg} cells from both controls and patients show increased expression of CTLA-4, HELIOS, and ICOS as compared to T_{conv} cells.