Temporal Stability and Molecular Persistence of the Bone Marrow Plasma Cell Antibody Repertoire

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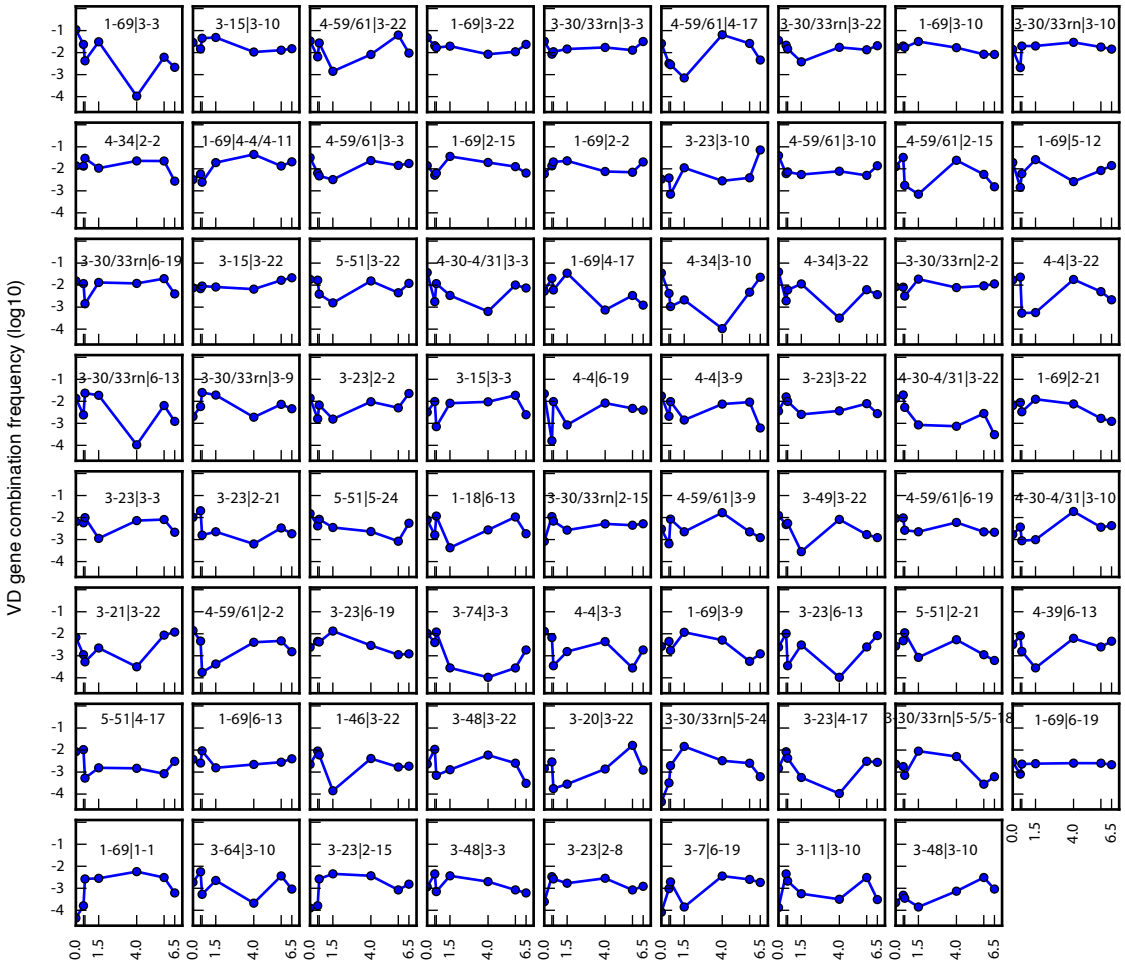
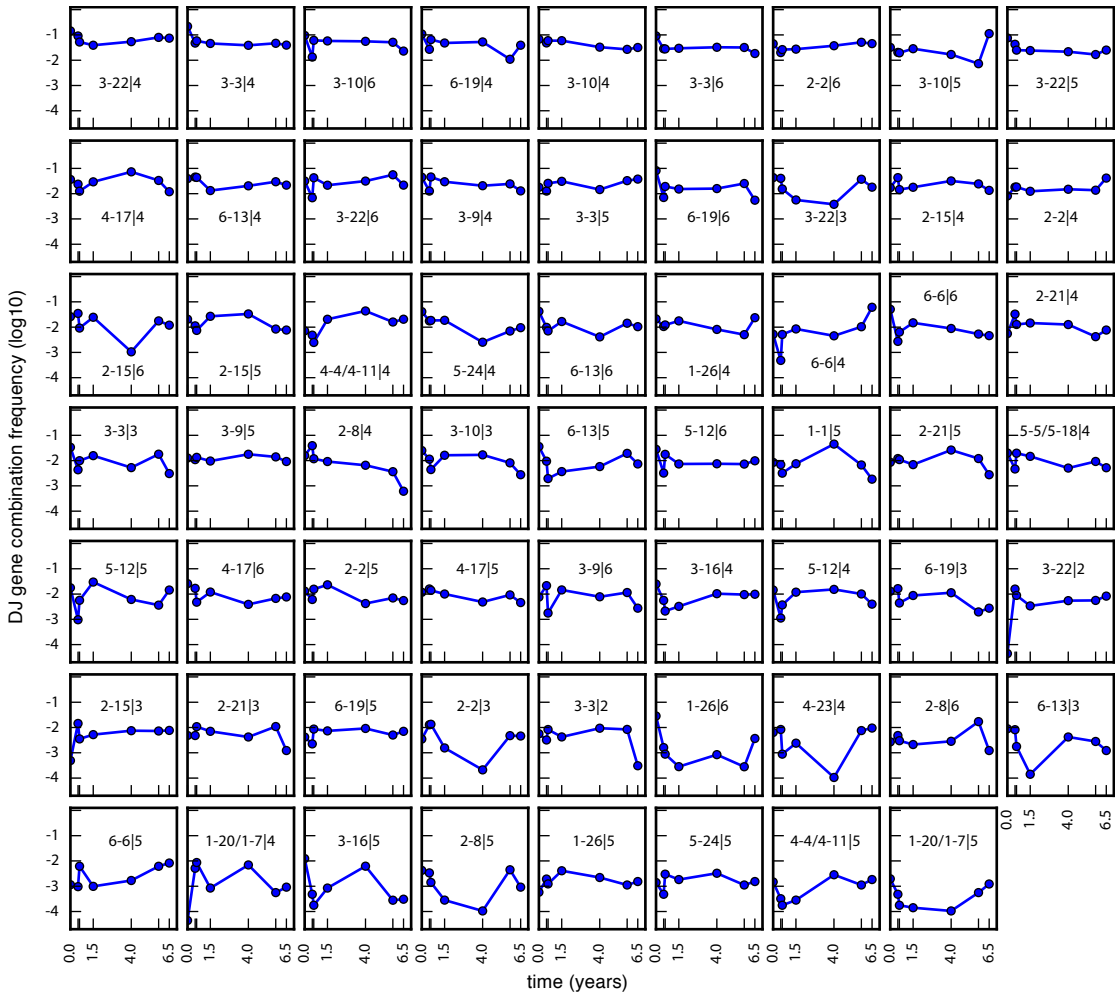
Supplementary Information

Sample ID	Donor	Age (years)	Time (years)	Cells counted	Read counts	Unique CDRH3s
d1t00a	1	10.9	0	6,674	49,742	4,290
d1t00b	1	10.9	0	1,298	110,619	4,338
d1t05	1	11.2	0.5	2,877	50,468	2,773
d1t06	1	11.5	0.6	5,047	39,683	3,265
d1t15	1	12.4	1.5	5,629	45,949	3,691
d1t40	1	14.9	4	1,870	70,692	3,709
d1t58	1	16.5	5.8	14,307	20,330	3,276
d1t65	1	17.3	6.5	6,735	21,996	2,843
d2t00	2	13.5	0	3,642	17,726	2,120
d2t28a	2	15.78	2.28	2,021	39,096	2,855
d2t28b	2	15.78	2.28	1,100	37,114	4,999
Total				51,200	503,415	38,159

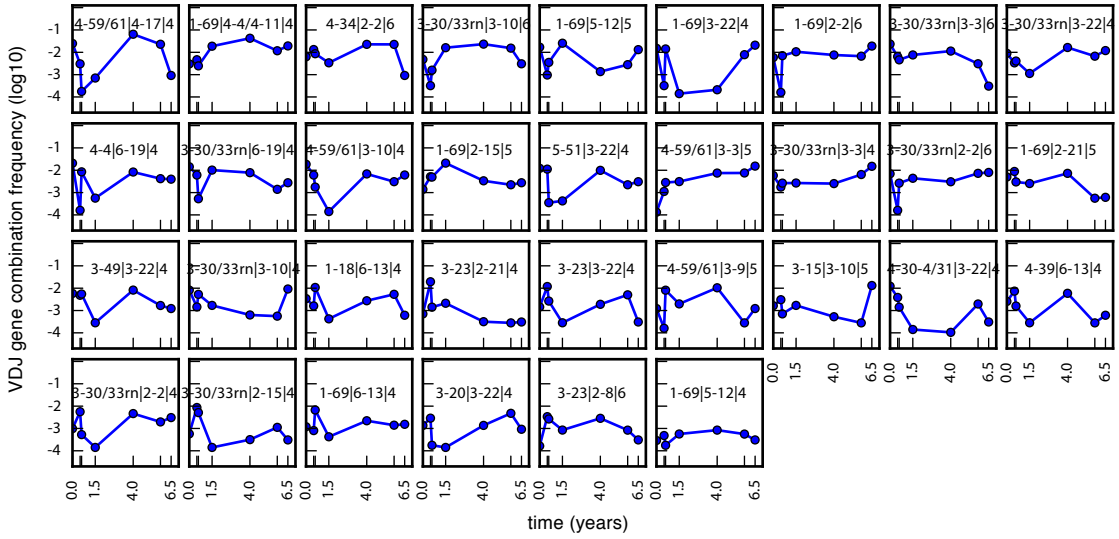
Supplementary Table 1: Donor and sequencing Information. Bone marrow plasma cells (BM PCs) were isolated from each sample by flow cytometry. BM PCs are defined as CD138+ CD38++ cells from bone marrow mononuclear cells. See **Fig. 1** and Materials and Methods. Donor 1 was diagnosed at the age of 9 years with adrenal neuroblastoma metastatic to the bone marrow. Patient underwent multiagent chemotherapy consisting of high dose alkylators, then consolidated with myeloablative therapy followed by hematopoietic stem cell transplant. Because of progressive disease in bone marrow and bones at age 10, local radiation and systemic 131 I-MIBG was given followed by anti-GD2 antibody immunotherapy, 3F8+ GM-CSF+ beta-glucan+ 13-cis- retinoic acid till age 14. Patient continued in remission through age 17 years. Because of cancer therapy, patient had to be re-immunized with tetanus, Hemophilus influenza b (Hib), Hepatitis B, and Polio at age 12 (before sample d1t15) and boosted again with Hib, Hepatitis B and Polio at age 13 (between sample d1t15 and d1t40). MMR (mumps measles rubella) vaccine was then given at age 14 (before sample d1t40 and d1t58 and d1t65). Donor 2 was diagnosed at the age of 4 with mediastinal neuroblastoma metastatic to bone and bone marrow and received high dose multiagent chemotherapy. Tumor recurred as epidural mass in the lumbar at the age of 12 and was retreated with high dose multiagent chemotherapy followed by myeloablative therapy plus autologous hematopoietic stem cell rescue and focal radiation to the spine. Patient was treated with anti-GD2 3F8 immunotherapy plus oral etoposide till age 14, and remained in remission through age 20 years.



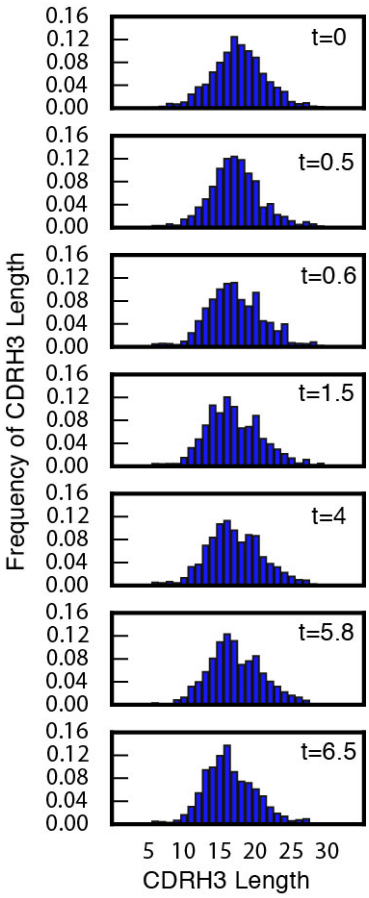
Supplementary Fig. 1a: IGH V-D combination gene use frequency from Donor 1. Plotted as in **Fig. 3**.



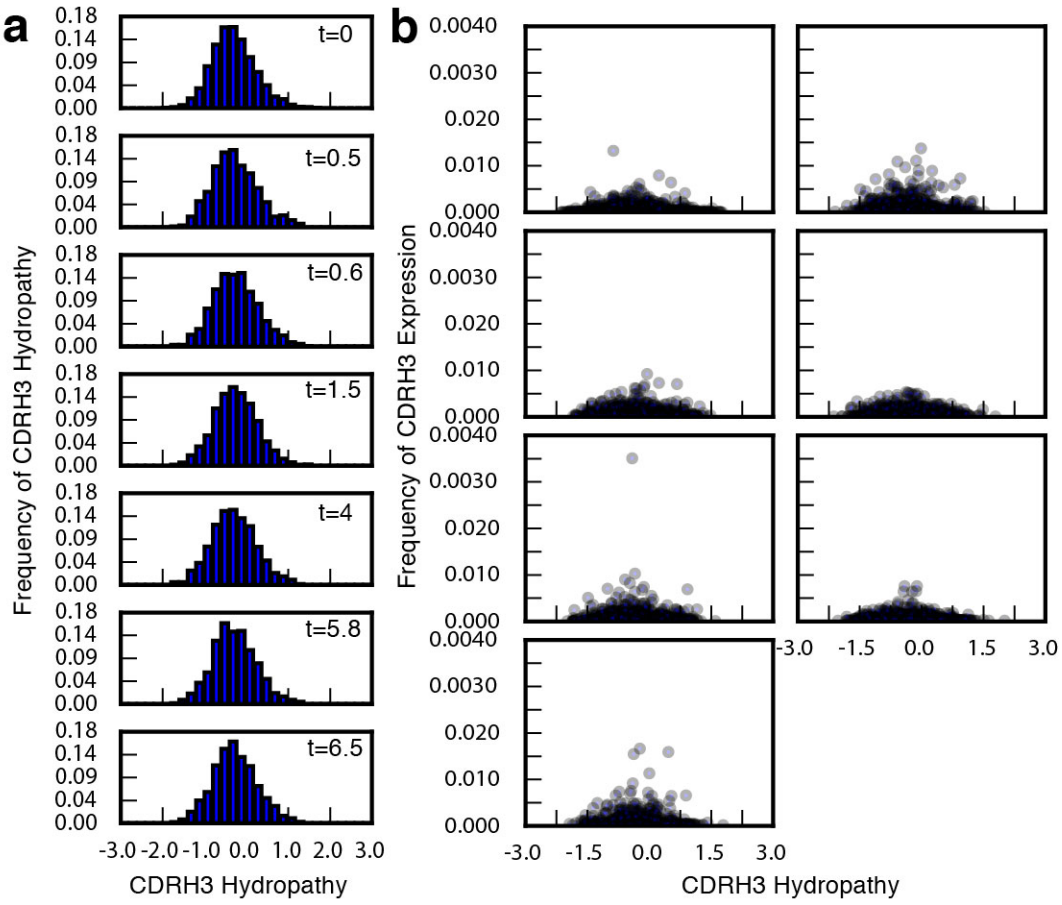
Supplementary Fig. 1b: IGH D-J combination gene use frequency from Donor 1. Plotted as in **Fig. 3**.



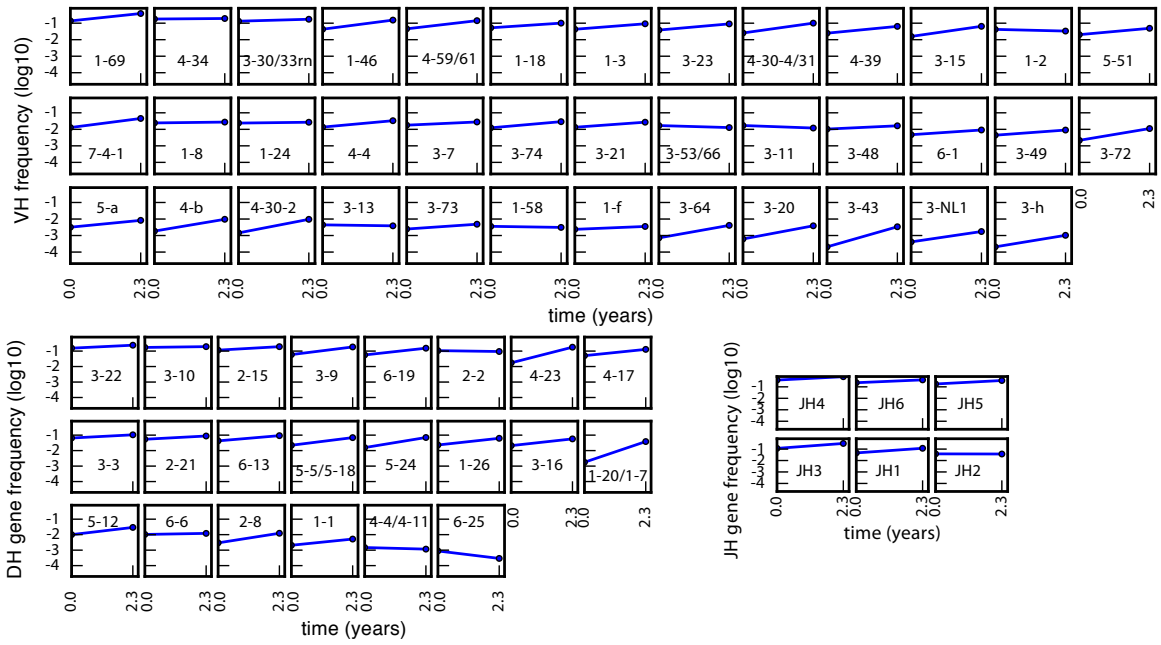
Supplementary Fig. 1c: IGH V-D-J combination gene use frequency from Donor 1. Plotted as in **Fig. 3**.



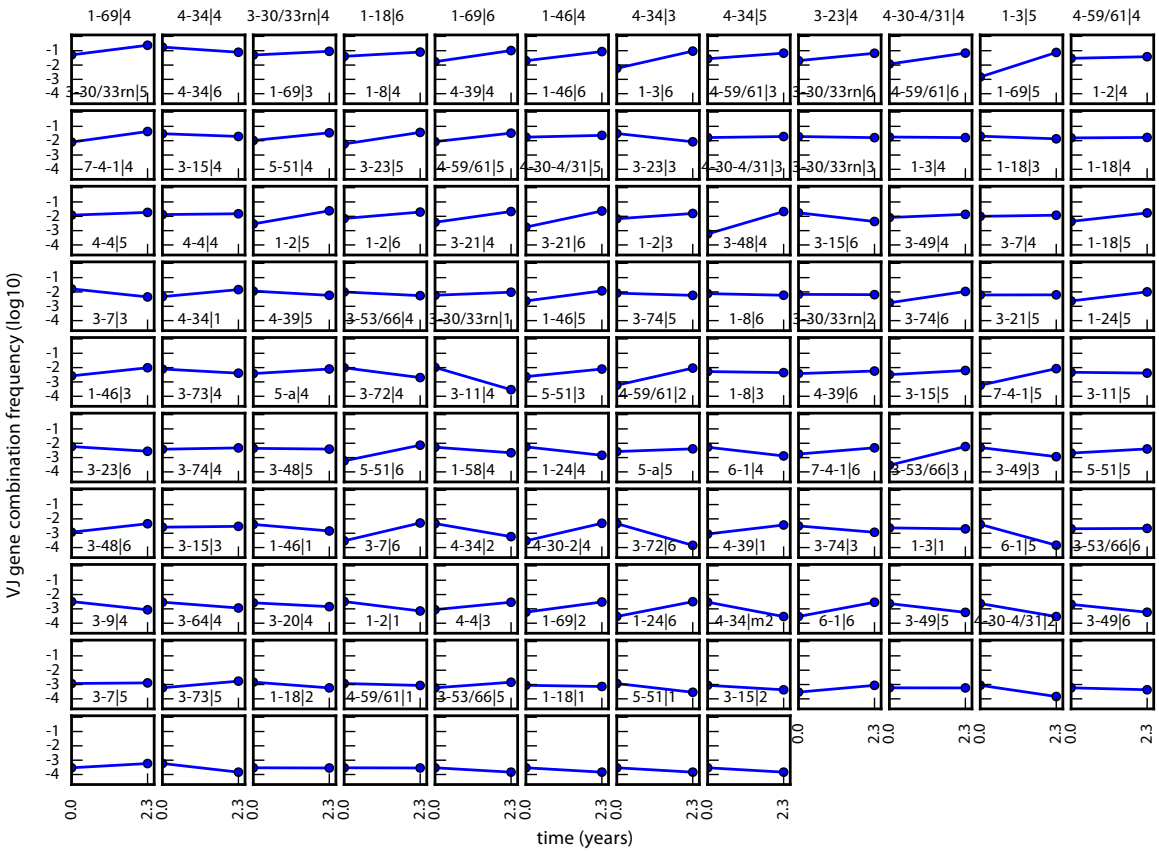
Supplementary Fig. 2: CDR-H3 length distribution for each timepoint from Donor 1.



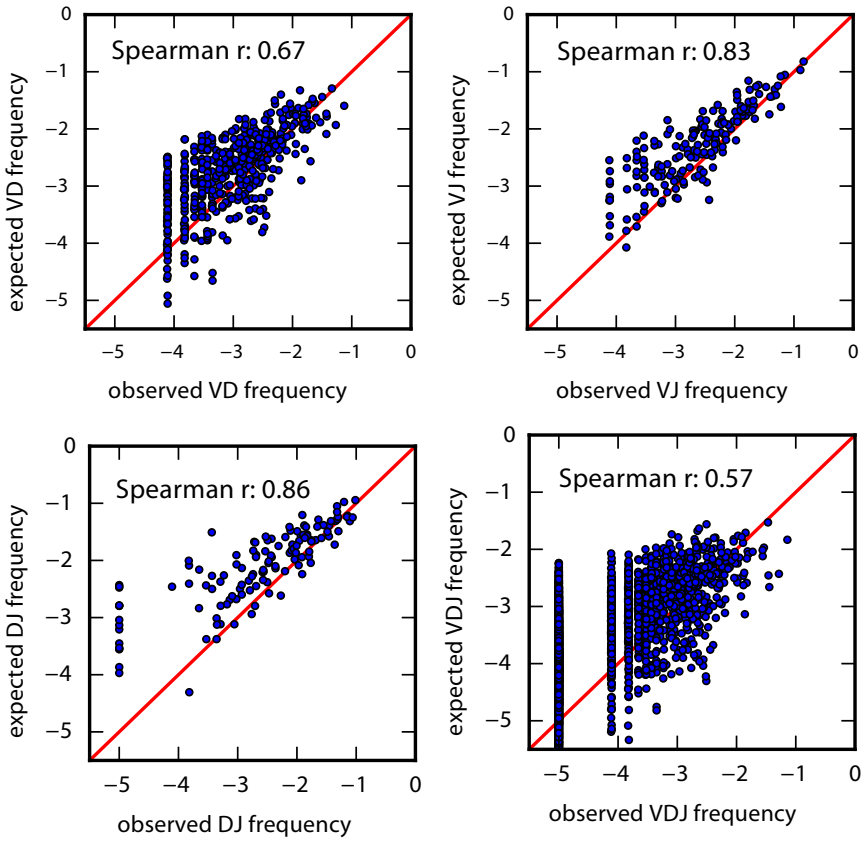
Supplementary Fig. 3: For Donor 1: (a) CDR-H3 hydropathy distribution for each timepoint. (b) CDR-H3 frequency versus hydropathy scatter plot.



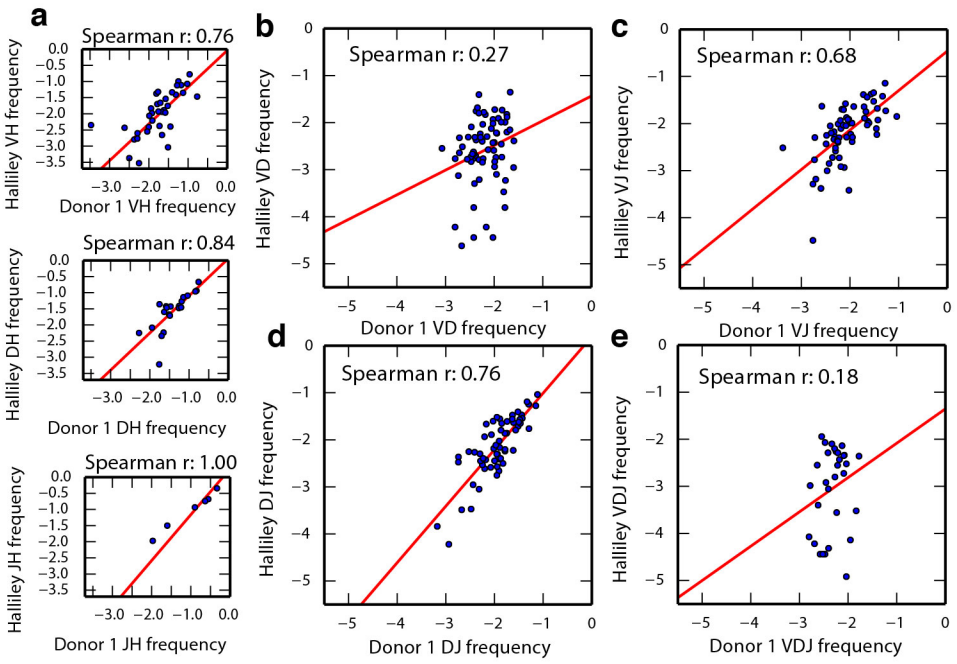
Supplementary Fig. 4: Donor 2 individual gene time course. Plotted as in **Fig. 2**.



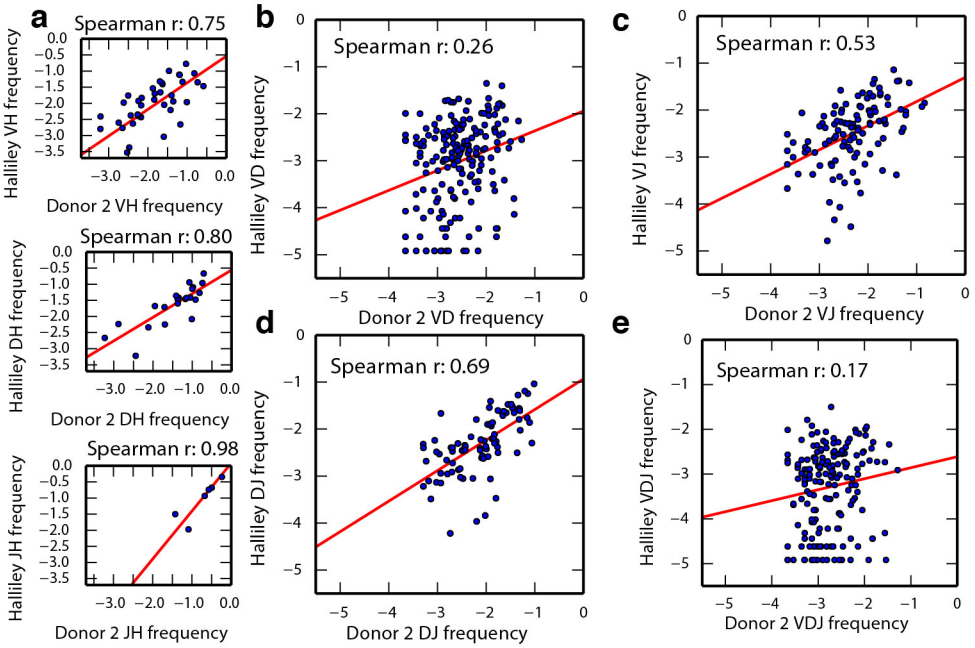
Supplementary Fig. 5: IGH V-J combination gene use frequency from Donor 2. Plotted as in **Fig. 3**.



Supplementary Fig. 6: a 2 expectation versus observed frequencies.



Supplementary Fig. 7: Correlation of gene and gene combination use frequencies between Donor 1 and donor from Halliley, 2015.



Supplementary Fig. 8: Correlation of gene and gene combination use frequencies between Donor 2 and donor from Halliley, 2015.