

Table S3. Identification of differentially expressed VF\_Hx signature genes in ATACSeq and MsRNAseq datasets

Count	VF_Nx AND VF_Hx	VF_Nx ONLY	VF_Hx ONLY				WT_Hx ONLY			
	41	155	158				144			
			ATACSeq		Ms RNAseq (MEPs)		ATACSeq		Ms RNAseq (MEPs)	
			log2_FC	p_value	log2_FC	p_value	log2_FC	p_value	log2_FC	p_value
Add3		2500002B13Rik	Abrac1	0.0224	0.7211	1.5408	0.1942	Acp6	0.0978	0.2488
Adh5		4930447F24Rik	Acin1	-0.2981	0.5905	1.5789	0.0165	Acsi3	0.0776	0.2764
Arid3a		Agl	Aco2	-0.1244	0.1143	0.8678	0.0538	Acvrl1	ND	ND
Ascc3		Agp	Adgr1	ND	ND	-0.6298	0.0106	Anp32b	0.0137	0.2545
Atg4c		Ak4	Agbl5	-0.0648	0.7728	-2.3993	0.0210	Anxa2	0.0887	0.4860
Atr		Aldh9a1	Anxa4	-0.1025	0.0247	1.0466	0.0045	Apbb1ip	-0.1211	0.0601
Babam2		Alkbh5	Ap1m1	0.1625	0.0021	-1.6205	0.0239	Arl6ip6	-0.0197	0.6575
Blm		Anln	Apoh	ND	ND	ND	ND	Atf3	0.0355	0.4069
Btln10		Ap5s1	Arid1b	-0.0794	0.0133	-3.2067	0.0978	Atp8b2	0.0317	0.7803
Cct3		Arih2	Asic1	ND	ND	0.2173	0.8420	B4galt5	ND	1.1045
Cyren		Atg9a	Atp11b	-0.1243	0.0631	5.3482	0.0000	Bag2	-0.4047	0.0002
Dpf1		Bmt2	Atp8b4	-0.1212	0.0398	3.9546	0.0046	Bcl2	ND	0.7168
Ecsit		Bnip3	Atxn7l2	-0.0954	0.4273	-2.3014	0.0847	Bcl7b	-0.1141	0.1539
Eif3a		Bsg	Aurkb	-0.1366	0.3360	-2.0335	0.0001	Bnip3l	-0.0271	0.8812
Exoc7		C2cd3	Avpi1	-0.0975	0.0769	-0.5834	0.0603	C9orf72	0.0407	0.2038
Fam168a		Ccdc115	Babam1	0.0072	0.7610	-1.9878	0.0275	Caprin1	-0.0586	0.3295
Fiz1		Ccng2	Bcl2l1	0.0107	0.6747	-1.0661	0.0205	Ccdc183	0.0654	0.1139
Grm4		Cers6	Bcl7a	-0.0214	0.8077	-1.0354	0.0000	Ccdc58	-0.0580	0.5985
Gsk3b		Ciart	Bivm	0.0464	0.5524	0.2242	0.7360	Ccnl1	-0.0365	0.6508
Hsp90b1		Cited2	Blm	0.0184	0.7215	2.5227	0.0091	Cdc42ep2	0.0788	0.3203
Itpr2		Cks2	Bnip1	0.0887	0.3523	-0.4842	0.0233	Cdca7	0.1419	0.0763
Mgat3		Coro2a	Brat1	-0.1710	0.0150	-4.6107	0.0186	Cdk5rap2	0.0455	0.3189
Mrpl34		Crocc	Brwd3	0.1005	0.4031	ND	ND	Cep170	0.0212	0.8847
Mrpl45		Crtap	Catspere2	ND	ND	ND	ND	Cep350	-0.0096	0.5411
Msh6		Cryz	Catsperz	ND	ND	ND	ND	Clptm1l	-0.0312	0.7611
Ncf4		Dapp1	Cda	-0.0215	0.9027	ND	ND	Clta	0.0803	0.0069
Ncln		Dbnl	Cdca3	-0.0412	0.2836	-0.6414	0.0064	CMTM7	-0.0001	0.8539
Numa1		Dcaf11	Cdk2ap2	-0.2158	0.0062	-2.2110	0.0031	Creb3	-0.0811	0.4438
Psm1		Dennd2d	Cdkl4	0.0016	0.9945	-0.2633	0.7425	Ctdsp1	-0.0601	0.0773
Rbpj		Dipk2a	Chd8	0.0067	0.9109	-0.7929	0.0016	Dars	-0.0550	0.5406
Rest		Dnajc5	Cish	0.0208	0.3524	2.6942	0.0509	Dido1	0.0438	0.3515
Septin9		Dph5	Cmtm8	0.0903	0.0918	0.6884	0.4585	Dlx1	ND	ND
Serpine1		Dph6	Coq2	-0.1914	0.0072	ND	ND	Efcab2	-0.0268	0.3339
Slc16a6		Elov16	Ctsa	-0.0167	0.9450	-0.5692	0.0207	Egfl7	-0.0604	0.3301
Slc29a2		Eno1	Cux1	0.0532	0.3870	1.0931	0.0001	EGLN1	0.0790	0.3729
Spidr		Epsti1	Dchs1	0.0052	0.9777	ND	ND	Elov15	0.0192	0.9834
Srsf1		Ero1a	Ddit4	-0.0006	0.9931	-2.1869	0.0087	Exosc8	-0.1691	0.3256
Ttc41		Fnip2	Dhcr24	0.0215	0.7920	-1.1844	0.0002	Extl2	0.0722	0.3067
Tut4		Ftx	Dhodh	0.0309	0.8694	-4.0743	0.0132	F11r	-0.0850	0.1105
Ubl7		G2e3	Dnaja1	0.0101	0.4232	0.6601	0.0207	Fam210a	0.0245	0.5733
Zfp609		Gapdh	Dok2	ND	ND	ND	ND	Fgf11	-0.1052	0.0989
		Gbe1	Dtw2	-0.0219	0.5387	0.3299	0.4565	Flacc1	ND	ND
		Glg1	Eif4ebp1	ND	ND	-1.6868	0.0027	Foxo3	-0.1010	0.0233
		Gm12796	Eri2	-0.1070	0.0564	0.6115	0.0261	Fyb	ND	-0.6910
		Gm14326	Esrra	-0.0850	0.2126	0.6531	0.1847	Gabpb2	-0.1280	0.0854
		Gm2059	F13a1	ND	ND	1.9208	0.0138	Galk1	0.0261	0.2934
		Gm31452	Fam117b	0.0123	0.5937	0.6845	0.2594	Gas2	0.4101	0.0000
		Gm31805	Fam32a	0.1199	0.0837	-0.1592	0.4268	Gm11444	ND	ND
		Gm32591	Fance	-0.1146	0.1279	-2.6220	0.0360	Gm11809	ND	ND
		Gm36339	Fbxl12os	ND	ND	1.4010	0.0814	Gm13414	ND	ND
		Gm36608	Fbxo10	0.1273	0.0579	-2.8196	0.0000	Gm16275	ND	ND
		Gm49722	Fhit	0.1067	0.0570	ND	ND	Gm17106	ND	ND
		Gm50149	Frs3	ND	ND	ND	ND	Gm20257	ND	ND
		Gne	Gas2l3	ND	ND	-1.3025	0.3174	Gm33373	ND	ND
		Golga7	Get3	ND	ND	-0.4939	0.0194	Gm37169	ND	ND
		Gtdc1	Gls2	0.0059	0.8483	ND	ND	Gm47648	ND	ND
		Gtf2e2	Gm2a	ND	ND	0.0296	0.9212	Gm5857	ND	ND
		Hagh	Gm41335	ND	ND	0.9873	0.2044	Gng5	-0.1218	0.1384
		Hikeshi	Gnat2	ND	ND	1.5908	0.1336	Gpn2	-0.0784	0.4503
		Hilpda	Hacd1	ND	ND	0.5051	0.3022	Gpx4	0.0884	0.2383
		Hnnpf	Hdgf	0.0264	0.9599	0.0891	0.9129	Hdlbp	0.0178	0.7451
		Hnnppl	Hic2	ND	ND	-0.3748	0.2106	Helb	-0.0246	0.7773
		Hnnpnm	Hk1	0.0485	0.4923	-2.6444	0.0003	Higd1a	-0.1308	0.0193
		Hrob	Hmg20a	-0.0247	0.8911	1.2678	0.0301	HK2	-0.0312	0.5260
		Iba57	Hnnpul1	0.0237	0.2783	1.2792	0.0283	Hmgn2	-0.1609	0.0706
		Ikzf2	Hnnpul2	-0.1087	0.1912	-0.6879	0.0047	IER3	0.0154	0.8028
		Il15	Homer1	0.0095	0.8937	0.6675	0.0890	Jmjd6	-0.0247	0.7323
		Imp4	Hormad2	ND	ND	0.2549	0.8824	Kcnq5	0.0592	0.5856
		Ing5	Hspa13	0.0599	0.3649	0.2017	0.4199	Klf13	-0.0816	0.0081
		Insig2	Id1	0.2043	0.1419	ND	ND	Kpna4	-0.0610	0.2791
		Itprid2	Il17ra	0.0146	0.8001	-3.1360	0.0074	Lmln	0.0690	0.3864
		Jund	Itsn2	-0.0753	0.1524	4.2532	0.0000	Lrmda	ND	-3.0995
		Kdm4b	Izumo4	-0.0112	0.9277	-1.2484	0.4196	Maz	-0.1695	0.0047

	Kmt2e	Kctd20	-0.0109	0.8968	1.1724	0.0248	Mcu	-0.1224	0.0464	-0.6358	0.0233
	Kmt5b	Khdrbs1	-0.0356	0.5791	-0.7592	0.0048	Mettl21a	-0.0598	0.3942	-0.4612	0.4171
	Kpna7	Khynyn	-0.0496	0.5662	-0.6585	0.0321	Mettl23	-0.0790	0.1954	-0.9449	0.0014
	Larp4	Khsrp	-0.0055	0.7076	-1.8919	0.0000	Mettl6	-0.0949	0.2379	0.6016	0.0190
	Ldha	Klf9	-0.0817	0.0960	-0.2292	0.3372	Mga	ND		-3.5223	0.0096
	Lmf1	Lbh	-0.1824	0.0017	1.4050	0.0747	Mllt10	-0.1145	0.0074	-0.6009	0.0047
	Maco1	Lipc	0.2387	0.0000	ND	ND	Msi2	-0.1693	0.0000	1.0260	0.0036
	Maml3	Lmbrd1	ND	ND	-0.4374	0.0448	NAIP	ND		0.5676	0.5009
	Mcl1	M1ap	0.0903	0.1619	-0.9628	0.0103	Nbn	0.0195	0.5482	-0.4831	0.1395
	Mcm3	Mapkapk3	-0.0282	0.7345	-1.4119	0.0163	NFE2L2	-0.0862	0.0910	0.9709	0.0138
	Med18	Mat2b	-0.1157	0.1917	-1.1419	0.0098	Nfx1	0.1026	0.0088	-0.6214	0.0022
	Mef2d	Mdm2	0.0152	0.6628	-4.7775	0.0404	Oip5os1	ND		0.4755	0.0663
	Mettl9	Metap1d	-0.0775	0.3195	0.9642	0.0077	P2ry1	-0.0818	0.5047	-0.6746	0.3499
	Mfsd8	Mindy1	ND	ND	2.5640	0.0119	Pced1a	-0.1284	0.2674	-1.0066	0.0018
	Mif	Mob3a	ND	ND	-1.0969	0.0013	Pde4dip	-0.1698	0.2214	1.6266	0.1173
	Mphosph10	Mthfd1l	0.0988	0.2135	-2.3469	0.0000	Pfkip	-0.0191	0.7376	1.7214	0.0059
	Mt1	Myo1h	ND	ND	-1.7252	0.0005	Plekha2	-0.0437	0.1559	0.1945	0.3679
	Mtss1	Nrros	-0.0560	0.4837	-1.5416	0.0030	Ppp3ca	-0.0251	0.2977	2.1786	0.0080
	Mxi1	Nudt6	0.0387	0.7670	-1.7812	0.0174	Prdx6	-0.0062	0.7983	-0.6250	0.0162
	Naa16	Nup205	-0.1168	0.2230	1.7327	0.0190	Prkacb	-0.1577	0.0040	1.449576	0.0920
	Nampt	Pa2g4	-0.1176	0.1381	-1.2240	0.0000	Ptgs2os2	ND		ND	
	Narf	Pank1	-0.0347	0.6130	-3.5241	0.0318	Ptp4a1	-0.0506	0.5158	-0.3438	0.2872
	Ncapgh2	Pard6b	0.0086	0.8998	-1.7855	0.0083	Pygo2	0.0839	0.3112	-4.5206	0.0060
	Neat1	Pcna	-0.1132	0.0402	1.3462	0.0001	Rara	-0.0756	0.0569	-1.0198	0.5541
	Neu2	Pfkm	-0.1146	0.1857	-1.5951	0.0000	Rcor2	0.1270	0.1578	-0.6755	0.6192
	Npm1	Pgm1	-0.0256	0.6891	-0.8433	0.0305	Rnf113a1	-0.0044	0.8104	-0.4441	0.0371
	Nudt3	Phf12	-0.1431	0.0202	-0.7301	0.0013	Rnf13	ND		2.0777	0.0179
	Parp9	Phf5a	-0.0602	0.6062	-0.6635	0.0249	Rnf19a	0.1322	0.0074	-1.2460	0.0069
	Pcgf5	Polg	-0.0421	0.4781	-4.7052	0.0074	Rnf7	-0.0288	0.6667	-0.1786	0.3722
	Pcid2	Ppia	-0.0578	0.4633	1.8435	0.0072	Rpn2	-0.0622	0.3447	0.6946	0.0055
	Pcif1	Ppid	-0.0709	0.6687	2.6889	0.0757	Rprd2	-0.0435	0.3487	0.8010	0.1827
	Pcx	Ppp1r1c	0.3021	0.0115	ND	ND	Rrbp1	0.1374	0.0093	-0.6186	0.0657
	Pdk1	Prickle4	-0.1225	0.1068	ND	ND	Safb2	0.1668	0.0034	3.0218	0.0038
	Pdss1	Ptbp3	ND	ND	-5.0577	0.0425	Set	0.0168	0.3178	-0.7712	0.0035
	Pdpx	Rangap1	-0.0126	0.5608	-2.7535	0.0047	Shc4	0.0267	0.5273	-1.4678	0.0000
	Pgam1	Rb1	-0.0508	0.7834	1.5416	0.0169	Slc12a6	-0.0990	0.1274	0.7296	0.0073
	Pgk1	Rbp7	ND	ND	1.2211	0.2074	Slc19a2	-0.0545	0.4836	-0.9641	0.3127
	Phtf1	Rdx	ND	ND	-4.1539	0.0417	Slc2a1	-0.1854	0.0007	-0.4940	0.29469
	Polr3g	Rem2	0.0331	0.8030	-1.5814	0.0555	Slc43a1	-0.1042	0.1317	-3.0392	0.0329
	Prpf38b	Rexo5	ND	ND	0.8818	0.0013	Spata13	0.0324	0.4174	-0.9998	0.1829
	Ptprj	Rnmt	-0.0271	0.7292	0.5324	0.0182	Spred1	-0.0120	0.9315	3.1021	0.0030
	Ranbp2	Rpa2	-0.0663	0.5750	-0.5893	0.0037	Srsf10	0.0796	0.1914	-0.9648	0.0133
	Rap1gds1	Rpl21	0.0274	0.7969	-0.3141	0.1746	St7l	0.0741	0.3501	-3.6838	0.0486
	Rgs11	Rusc1	-0.0095	0.7951	-1.3189	0.0184	Surf4	0.0254	0.8010	-4.4550	0.0117
	Rmc1	Saysd1	-0.0767	0.3002	-0.7686	0.0058	Susd1	0.2631	0.0000	3.3281	0.0019
	Rnf145	Scrn3	0.0572	0.5168	-0.8524	0.0000	Syncrip	-0.0444	0.4214	-1.2429	0.0085
	Ruvbl2	Sde2	-0.0416	0.1223	-0.9624	0.0000	Tacc1	0.0672	0.0462	-0.6373	0.0021
	Sacm1l	Selenbp1	ND	ND	-1.1665	0.0000	Tesk1	0.0214	0.2106	-3.0442	0.0107
	Sdr39u1	Sertad1	0.0234	0.4931	-1.4131	0.0049	Tet2	-0.2865	0.0000	-4.5487	0.0154
	Seh1l	Sertad2	-0.0604	0.5061	-0.8989	0.0010	Ticam2	ND		0.7512	0.0404
	Sema6b	Sesn2	-0.1436	0.1276	-2.8029	0.0000	Tmem131l	ND		1.7757	0.1536
	Sil1	Skil	0.0367	0.4566	0.9684	0.0426	Tomm40	0.0985	0.0957	0.9510	0.0952
	Sinhcaf	Slc2a3	ND	ND	1.2811	0.0003	Tpm3	0.0426	0.5613	-0.7538	0.0017
	Sipa1l1	Smim4	-0.1490	0.0231	0.3669	0.1778	Tprn	0.0642	0.3051	-1.6875	0.0000
	Slc35c1	Snx1	0.0156	0.7453	-0.6050	0.0030	Traf3ip3	-0.1077	0.0928	0.6246	0.0480
	Slc43a2	Srsf3	-0.1010	0.2066	3.8115	0.0036	Trim59	-0.1755	0.0319	-0.1265	0.6081
	Spop	St13	-0.2299	0.0031	0.8913	0.0005	Trmo	ND		0.1961	0.6614
	Syce2	Strip1	-0.0797	0.2862	-1.8559	0.0058	Ttc39b	0.1413	0.0088	0.3798	0.1038
	Tgfbf2	Stxbp2	0.0939	0.1897	1.5671	0.2005	Tubb5	ND		-1.1194	0.1522
	Thra	Sun1	-0.0167	0.8440	-1.9502	0.0107	Txndc9	-0.1125	0.1423	0.6148	0.0167
	Tob1	Syvn1	-0.0516	0.5104	-6.6369	0.0000	Txnl4b	-0.0361	0.6743	-0.5935	0.0207
	Tom1	Tent2	ND	ND	2.4213	0.0192	Ubap2l	-0.0360	0.9712	-6.7411	0.0031
	Tor4a	Timm21	-0.0226	0.7245	0.2948	0.2296	Ufl1	0.0859	0.4147	-0.3033	0.1573
	Tram2	Tmem147	0.1888	0.1065	-1.3386	0.0082	Ugcg	0.1297	0.0684	0.8283	0.0483
	Trerf1	Tmem192	-0.0249	0.6713	-1.4587	0.0223	Usf1	-0.0478	0.6708	-0.6878	0.0014
	Trim33	Tmigd3	ND	ND	ND	ND	WIPF1	0.0131	0.3905	-0.0238	0.9806
	Triobp	Tnfaip8	-0.1610	0.0001	2.0930	0.0581	Zbtb7b	-0.0145	0.8393	-2.0332	0.1841
	Tut7	Tnks	0.0049	0.9851	-0.2611	0.2457	Zc3h6	-0.1618	0.0453	0.0534	0.8567
	Ubalcl1	Trappc5	0.0377	0.3727	-1.5558	0.0143	Zfp106	ND		-2.2667	0.0154
	Utp11	Trp53cor1	ND	ND	0.6225	0.5359	Zfp335os	ND		-0.9236	0.1213
	Vdac1	Tubb4b	0.0815	0.1143	-1.4589	0.0000	Zfp653	ND		-1.0494	0.1271
	Vps8	Tubgcp2	-0.1666	0.0093	1.0410	0.0429					
	Wipf1	Uhrf2	0.1580	0.0489	1.5678	0.0000					
	Yars2	Unc13a	ND	ND	-0.1981	0.4672					
	Zbtb16	Usp36	0.0378	0.6478	2.9738	0.0118					
	Zdhhc5	Usp5	-0.0650	0.1245	-2.6077	0.0055					
	Zfat	Vasp	-0.0722	0.3050	-1.2881	0.0106					
	Zfp24	Wsb1	-0.0640	0.5865	1.0096	0.0023					
	Zfp446	Yju2	ND	ND	0.9086	0.0025					

		Zfp451	Zdhhc19	ND	ND	1.0592	0.1475					
		Zfp607b	Zfp945	ND	ND	2.9587	0.0189					
		Zfp639	Zkscan14	ND	ND	-0.7131	0.0202					
			Zmiz1	ND	ND	2.2227	0.0174					
			Znhit3	ND	ND	0.6369	0.1567					
			Znrf4	ND	ND	ND	ND					