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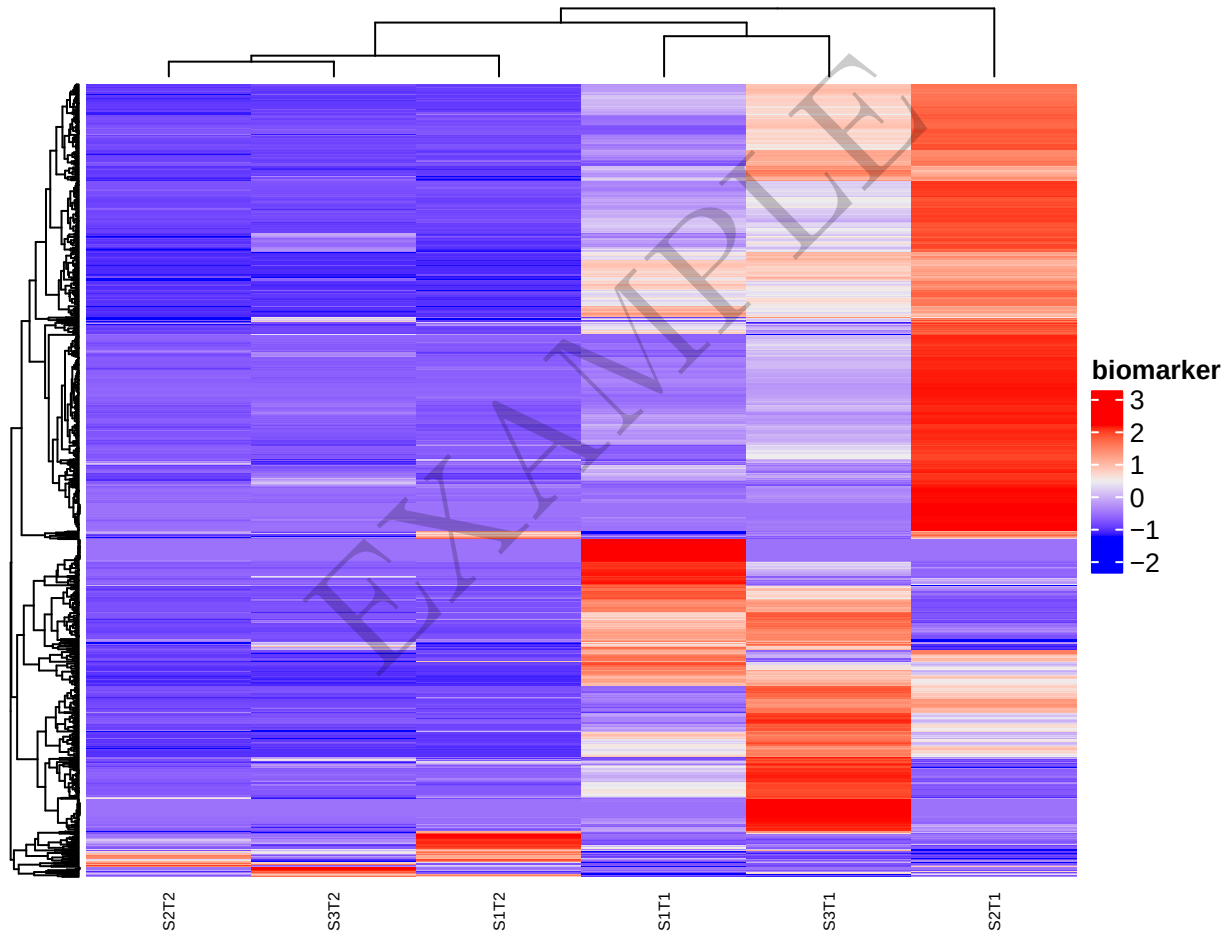
3607 Parkway Ln, Suite 200
Norcross GA 30092
1-888-494-8555
www.raybiotech.com

EXAMPLE REPORT

Biostatistics & Bioinformatics Services

"Cluster Analysis" Service



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Bioinformatics Team, RayBiotech
November 30, 2018

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1 Introduction

The "Cluster Analysis" service performs a preliminary exploration of the data profile. It filters and scales the data before it clusters sample data based on hierarchical clustering and principal component analysis (PCA).

> *Need help understanding how the statistical analyses were performed in layman's terms? Please visit our* website.

2 Methods

2.1 Data filtration

Samples with missing data were identified and excluded from the analysis. Biomarkers showing no variation across all the subjects (i.e., zero-variance), were excluded from the analysis.

2.2 Data scaling

The original biomarker values were first centered and scaled by subtracting the mean of each biomarker from the data and then dividing it by the standard deviation, respectively. Centering and scaling results in a uniform mean and scale across all the biomarkers, but leaves their distribution unchanged.

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2.3 Principal component analysis (PCA)

The scaled data were transformed with principal component analysis (PCA). Each principal component (PC) derived from PCA was a weighted summation of all the input measurements/biomarkers, in which the weights form a vector orthogonal to those of the other PCs. Thus a sample with p biomarker values was transformed to a datapoint defined by PCs. The PCs were ordered by variation contained/explained by themselves, thus providing a good way for dimension reduction and pattern observation. Also, the biomarkers with large weights in a PC might share some common characterisitics.

2.4 Heatmap with hierarchical clustering

The scaled and centered data were plotted as a heatmap in which the different colors represent biomarker expression levels. The biomarkers and samples were then subjected to hierarchical clustering based on Euclidean distance.

2.5 Software

All the analyses were conducted using R programming language V 3.5.1 (R Core Team 2017).

3 Results

3.1 Data filtration

Samples with missing data: None.

Biomarkers with zero variance: 56, including BLC, Eotaxin-2, G-CSF, IFNg, IL-1a, IL-2, IL-4, IL-5, IL-10, IL-13, MIG, TNFa, TNFb, IL-29, 4-1BB, CD30, IL-1 RI, IL-10 Rb, PDGF Rb, RAGE, XEDAR, Angiostatin, IL-2 Ra, IL-23, Siglec-5, IL-1 R4, ANGPTL4, hCGb, IL-1 RII, MMP-3, OSM, CTLA4, EDA-A2, FGF-6, FGF-9, IL-1 F9, IL-1 F10, IL-10 Ra, Leptin R, Mer, ADAMTS13, Angiotensinogen, B7-H1, BMPR-IA, BMPR-II, CNTF, Fractalkine, GITR L, IL-15 R, IL-32 alpha, MEPE, ROBO3, Siglec-7, Syndecan-3, Thrombospondin-2 and BOC. These biomarkers were excluded from PCA and heatmap analyses.

3.2 Data scaling

An example of data scaling is shown in Figure 1.

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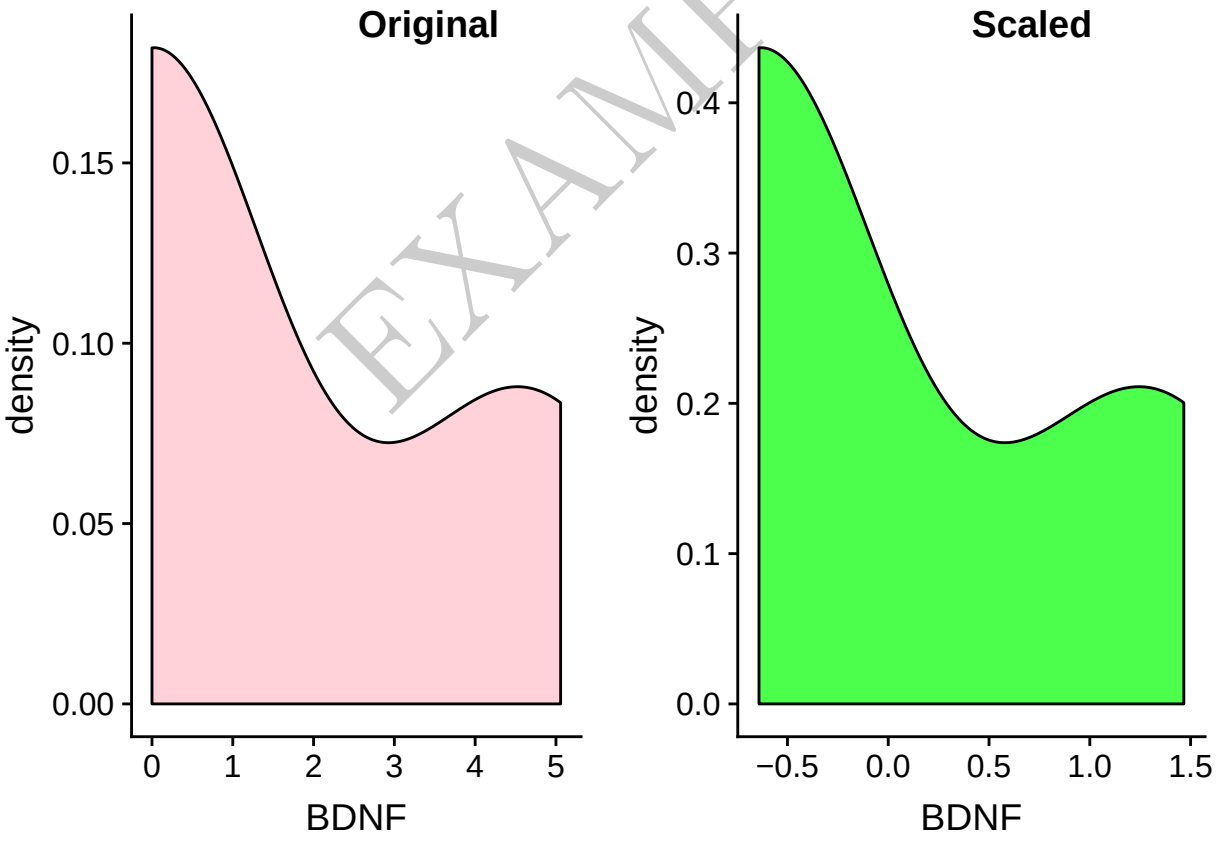

Figure 1: Density plot of biomarker BDNF before and after scaling

3.3 Principal component analysis

Table 1 and Figure 2 demonstrate the percentage of variance explained by each PC, ordered by variance explained.

Table 1: Variance explained by each Principal Component

PC	Variance Explained %
PC1	58.62
PC2	25.06
PC3	11.39
PC4	3.50
PC5	1.43
PC6	0.00

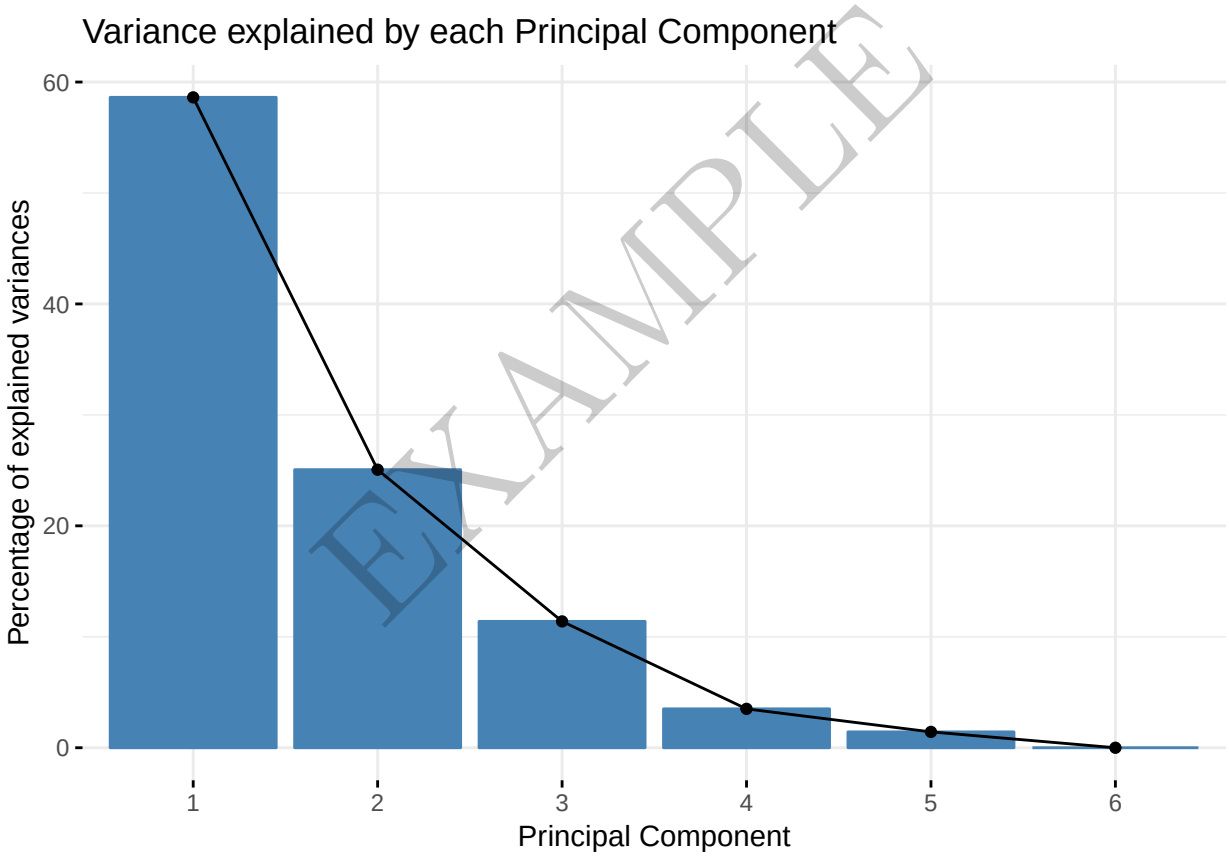

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Figure 2: Variation explained by each principal component

Table 2 lists the calculated values for the top PCs. Note that these values are the result of data transformation.

Table 2: PCs of 6 samples

	PC1	PC2	PC3	PC4	PC5	PC6
S1T1	-1.555609	16.080781	18.136019	-0.5656852	0.0434655	0
S2T1	-38.491990	-18.554884	1.892770	-0.0378606	-0.0786361	0
S3T1	-15.676654	21.429690	-13.836614	-0.0217256	-0.0873416	0
S1T2	19.145544	-7.045838	-2.787251	-9.4058087	2.7175526	0
S2T2	19.125081	-6.275036	-1.825397	1.3896242	-6.6197649	0
S3T2	17.453628	-5.634713	-1.579527	8.6414559	4.0247245	0

Figure 3 plots the samples by their PC1 and PC2 values. Since the data variation is explained the most by PC1, and then PC2, and so on, this scatter plot of the first two PCs presents the pattern of samples while keeping as much as information about variations across them.

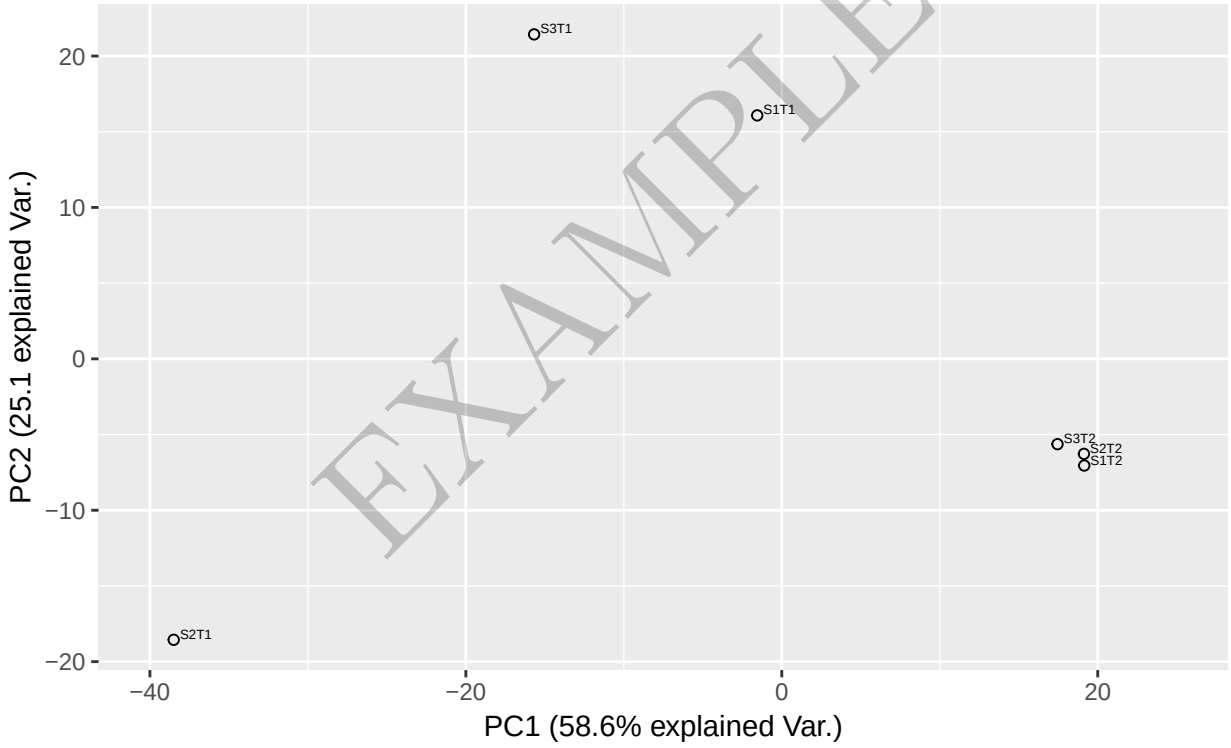

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Figure 3: Plot of PC1 and PC2 values of 6 samples

Table 3 lists the weights of the first 40 biomarkers in 6 PCs.

Table 3: Weights of 40 biomarkers in 6 Principal Components

	PC1	PC2	PC3	PC4	PC5	PC6
Eotaxin	-0.0139	0.0444	-0.0631	-0.0003	-0.0032	0.4175
GM-CSF	-0.0352	-0.0363	0.0052	-0.0006	-0.0031	0.7008
I-309	-0.0043	0.0434	0.0710	-0.0086	0.0009	0.5388
ICAM-1	-0.0387	0.0170	0.0310	-0.0061	-0.0055	-0.1055
IL-1b	-0.0014	0.0333	0.0826	-0.0084	0.0016	0.1487
IL-1ra	-0.0395	0.0208	0.0178	-0.0064	-0.0040	-0.0002
IL-6	-0.0139	0.0444	-0.0631	-0.0003	-0.0032	-0.0018
IL-6R	-0.0206	0.0562	0.0121	-0.0070	-0.0021	-0.0072
IL-7	-0.0341	-0.0384	0.0086	-0.0006	-0.0029	0.0026
IL-8	-0.0085	0.0308	0.0826	-0.0088	0.0006	-0.0013
IL-11	-0.0315	0.0220	-0.0559	-0.0006	-0.0046	0.0035
IL-12p40	0.0172	-0.0133	-0.0155	-0.1407	0.0913	-0.0018
IL-12p70	-0.0145	0.0522	-0.0472	-0.0021	-0.0029	-0.0014
IL-15	-0.0341	-0.0384	0.0086	-0.0006	-0.0029	-0.0007
IL-16	-0.0055	0.0468	0.0656	-0.0086	0.0007	-0.0026
IL-17	-0.0140	0.0452	-0.0617	-0.0005	-0.0032	-0.0022
MCP-1	-0.0092	0.0568	0.0418	-0.0081	-0.0003	-0.0016
MCSF	-0.0395	0.0038	0.0346	-0.0090	-0.0107	-0.0040
MIP-1a	-0.0397	-0.0064	-0.0330	-0.0024	-0.0035	0.0031
MIP-1b	-0.0320	0.0091	-0.0584	-0.0135	-0.0555	-0.0046
MIP-1d	-0.0139	0.0444	-0.0631	-0.0003	-0.0032	-0.0018
PDGF-BB	-0.0076	0.0544	0.0496	-0.0119	-0.0009	-0.0077
RANTES	-0.0040	0.0422	0.0726	-0.0086	0.0010	0.0010
TIMP-1	-0.0302	0.0448	-0.0132	-0.0057	-0.0043	0.0006
TIMP-2	-0.0328	0.0413	-0.0011	-0.0052	-0.0030	0.0008
TNF RI	-0.0413	0.0031	0.0225	-0.0058	-0.0040	0.0028
TNF RII	-0.0268	0.0502	0.0056	-0.0088	-0.0014	-0.0003
AR	-0.0387	-0.0260	-0.0087	-0.0078	-0.0117	-0.0026
BDNF	0.0256	-0.0208	-0.0160	-0.0290	0.1888	-0.0054
bFGF	-0.0381	0.0093	0.0402	-0.0083	-0.0135	-0.0020
BMP-4	0.0395	-0.0186	-0.0021	-0.0386	-0.0201	0.0064
BMP-5	-0.0386	-0.0266	-0.0094	0.0007	-0.0032	0.0008
BMP-7	-0.0098	-0.0546	-0.0433	-0.0224	0.0406	0.0036
b-NGF	-0.0369	-0.0324	-0.0015	-0.0037	-0.0013	0.0013
EGF	-0.0400	-0.0216	-0.0048	-0.0006	0.0137	-0.0002
EGF R	-0.0404	-0.0183	0.0121	-0.0011	0.0055	0.0023
EG-VEGF	-0.0409	-0.0067	-0.0228	-0.0123	-0.0082	0.0007
FGF-4	-0.0385	-0.0259	-0.0117	-0.0113	0.0091	0.0010
FGF-7	-0.0401	-0.0208	-0.0084	0.0020	-0.0096	0.0020
GDF-15	-0.0417	-0.0032	0.0173	-0.0041	-0.0078	-0.0026

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Figure 4 shows the weights of 944 biomarkers in the first 2 PCs.

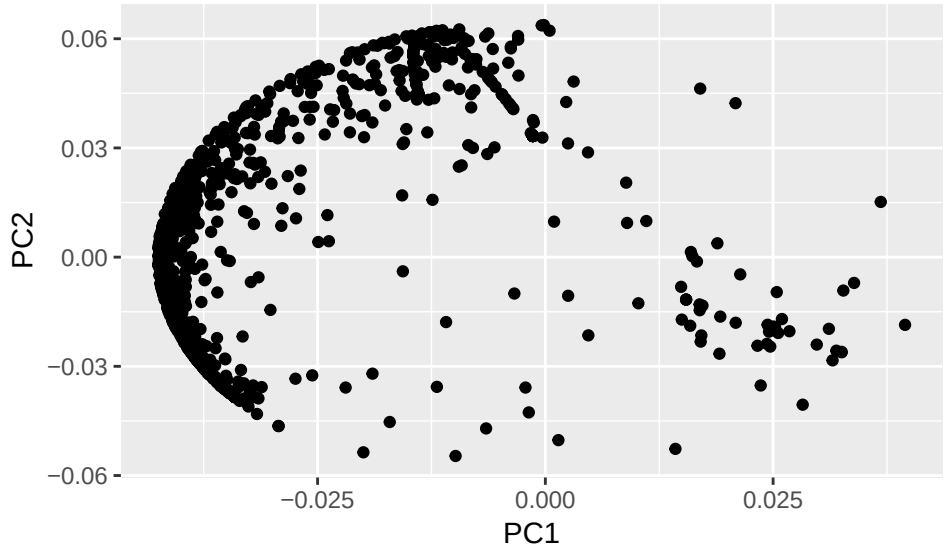

Figure 4: Weights of 944 biomarker in the first 2 PCs

3.4 Heatmap with hierarchical clustering

The 944 biomarkers were clustered into 5 groups (see Figure 5, Table 4) by Euclidean distance after scaling and centering.

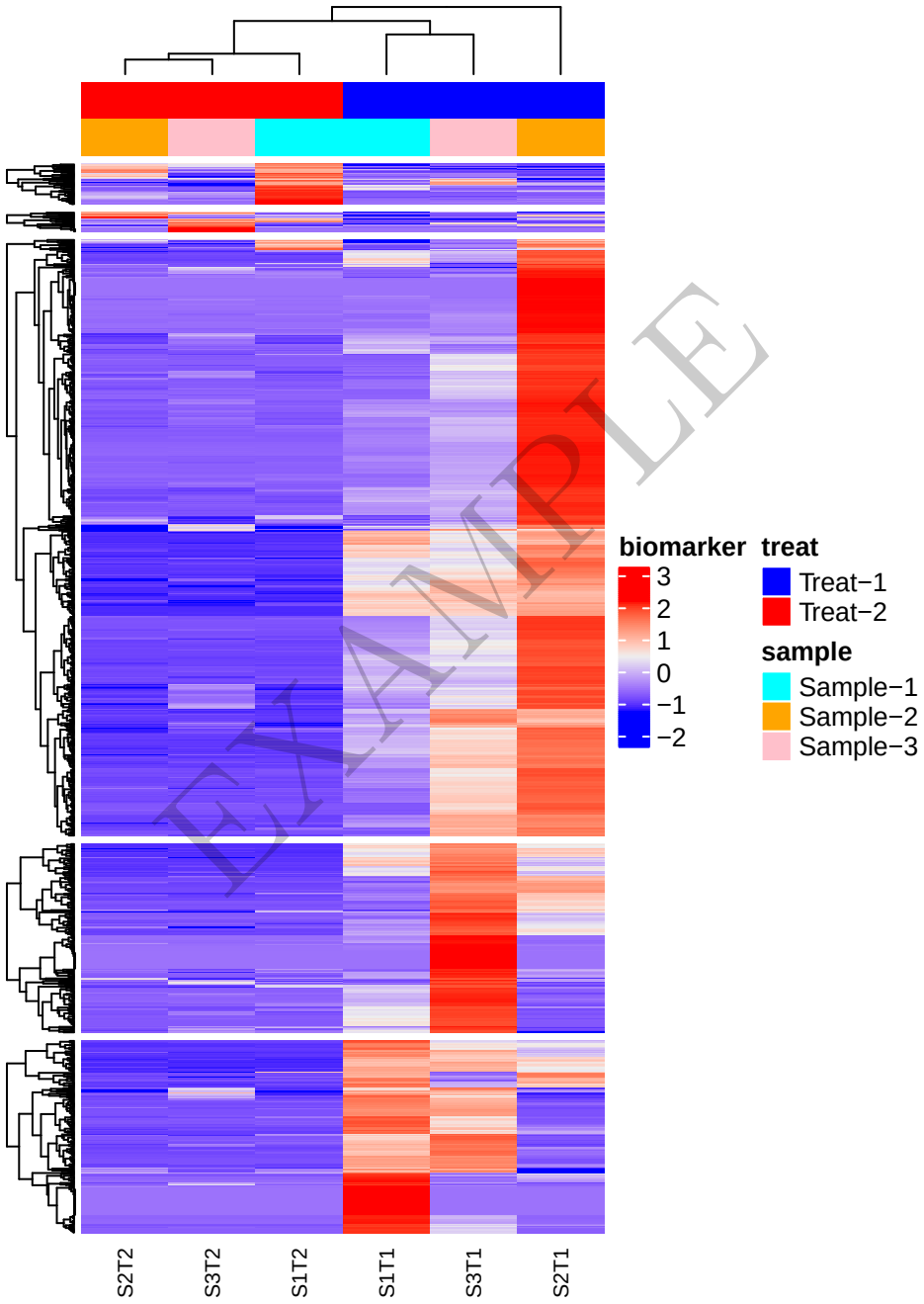

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Figure 5: Heatmap of 944 biomarkers in 6 samples

Table 4: Biomarkers clustered into 5 groups using hierarchical clustering

Ord	Biomarker	Ord	Biomarker	Ord	Biomarker	Ord	Biomarker	Ord	Biomarker
Cluster1									
1	ULBP-2	9	Layilin	17	CHMP2B	25	FAS L	33	IL-13 R1
2	Pref-1	10	Prolactin	18	Dopa Decarboxylase	26	MEF2C	34	GASP-1
3	BMP-4	11	Follistatin-like 1	19	NUP85	27	CTACK	35	CD48
4	IL-13 R2	12	L1CAM-2	20	CD40	28	HB-EGF	36	IL-12p40
5	BMPR-IB	13	Nectin-4	21	LAIR1	29	FCRL2	37	IL-17C
6	NGF R	14	DLL1	22	Cadherin-11	30	Shh-N		
7	SIGIRR	15	Activin R1A	23	VEGF-C	31	EphB2		
8	IGFBP-3	16	GITR	24	ANGPTL3	32	Neurogranin		
Cluster2									
1	GASP-2	5	Persephin	9	BDNF	13	Syntaxin 6	17	ACE-2
2	TRANCE	6	ULBP-1	10	SLAM	14	CRTAM	18	RANK
3	ADAMTSL-1	7	ErbB4	11	uPA	15	TRAIL R2		
4	Sirtuin 1	8	Siglec-2	12	CHST1	16	WISP-1		
Cluster3									
1	BMP-7	110	VEGF-D	219	Desmoglein-3	328	TAFA2	437	Siglec-6
2	TGFb RIII	111	Dtk	220	ADAM12	329	CD58	438	SMPD1
3	CD155	112	TREM-1	221	Olig2	330	Nidogen-1	439	Ficolin-1
4	PD-L2	113	ICOS	222	IL-4 Ra	331	Progranulin	440	AIF
5	OPN	114	Thyroid Peroxidase	223	LAMP2	332	CRP	441	LAMP
6	IL-18 BPa	115	S100A8	224	CA19-9	333	Galectin-7	442	Trypsin 3
7	IL-1 R5	116	Semaphorin 6B	225	Siglec-11	334	ALCAM	443	CRISP-2
8	Activin RIIB	117	GDNF	226	MDL-1	335	VEGF R1	444	Glyoxalase II
9	PF4	118	DBH	227	EphA2	336	Cystatin C	445	LILRB4
10	DC-SIGNR	119	Testican 2	228	TWEAK	337	TSP-1	446	GKN1
11	CEACAM-5	120	CHST2	229	MCSF R	338	IL-1ra	447	Matrilin-3
12	Galanin	121	TECK	230	HO-1	339	EphB3	448	LRIG1
13	Hepsin	122	CHST3	231	B7-H4	340	Nectin-2	449	Cerberus 1
14	ENPP-2	123	GLP-1	232	cIAP-1	341	Sirtuin 5	450	FGF-17
15	Kell	124	CNTF R alpha	233	PD-ECGF	342	S100A13	451	GALNT2
16	Pepsinogen II	125	GM-CSF Ra	234	RELT	343	Caspase 7	452	Enteropeptidase
17	SALM4	126	Cystatin SA	235	ENA-78	344	CPE	453	THAP11
18	IL-31	127	Cadherin-13	236	MIP-3b	345	Activin RIIA	454	GFR alpha-2
19	MMP-8	128	BATF3	237	EGF R	346	Sortilin	455	SorCS2
20	BCAM	129	FGF-7	238	Serpin B6	347	PYY	456	TROY
21	ErbB3	130	VEGF R2	239	NPTXR	348	FGF-12	457	HS3ST4
22	PILR-alpha	131	PTP1B	240	GATA-5	349	vWF-A2	458	FABP4
23	Kallikrein 5	132	Prolactin R	241	Tenascin R	350	CANT1	459	CXADR
24	Neprilysin	133	FKBP51	242	GFAP	351	ACE	460	PON1
25	EDIL3	134	B7-H2	243	Granzyme H	352	Bcl-10	461	EpCAM
26	SP-D	135	Nectin-3	244	Nrf2	353	ARSB	462	GPR115
27	TSLP	136	EGF	245	TCN2	354	Wnt-4	463	EMMPRIN
28	Ubiquitin+1	137	GDF-3	246	FABP8	355	FGF-5	464	Cadherin-17
29	PAPP-A	138	FGF-4	247	CA2	356	Pentraxin 3	465	C1qTNF9
30	TRACP	139	Ck beta 8-1	248	TGM4	357	BLAME	466	Cyclophilin A
31	FGF-21	140	BMP-5	249	TREML1	358	ST8SIA1	467	Siglec-1
32	TLR4	141	Cystatin SN	250	CD39L2	359	Draxin	468	LRRTM4
33	CF VII	142	AR	251	CES1	360	Neudesin	469	CRTAC1
34	Ephrin-A4	143	SOST	252	Troponin I	361	Granzyme A	470	EphB4
35	Cadherin-4	144	CD314	253	ULBP-3	362	HepaCAM	471	PDGF R alpha
36	TMEFF1	145	Erythropoietin	254	LAIR2	363	TAZ	472	PIGF
37	Cystatin A	146	HIF-1 beta	255	NT-4	364	MCEMP1	473	Plexin B3
38	Calcitonin	147	IL-17F	256	CEACAM-1	365	FOLR2	474	Mcl-1
39	IL-19	148	DPPII	257	IL-23 R	366	GIF	475	Plexin D1
40	IL-15	149	MCP-4	258	IGFBP-4	367	SorCS1	476	Podocalyxin
41	Common beta Chain	150	CD200 R1	259	PRDX4	368	Galectin-9	477	DDR1
42	DSPG3	151	p63	260	LAMP1	369	FCRL1	478	sFRP-3
43	CD84	152	CES2	261	TFF3	370	GALNT10	479	Cathepsin H
44	Renin	153	GDF-9	262	CD300c	371	Neuroligin 2	480	TPP1
45	MSP	154	DNMT3A	263	Jagged 2	372	R-Spondin 2	481	Nogo-A
46	MPIF-1	155	gp130	264	PTH	373	HS3ST1	482	Caspase 8
47	GRO	156	Kallikrein 11	265	Aminopeptidase P2	374	NPDC-1	483	SCF
48	6Ckine	157	Desmin	266	CDNF	375	Biglycan	484	Integrin alpha 1
49	IL-7	158	MIP-3a	267	Lipocalin-2	376	B7-H3	485	Matriptase
50	IGF-1	159	GUSB	268	CHI3L1	377	TSK	486	TrkA
51	ST6GAL1	160	MSP R	269	LOX-1	378	MIF	487	GHR
52	DKK-1	161	Notch-3	270	ICAM-1	379	METAP2	488	IFN-gamma R1
53	PAI-1	162	MDGA2	271	Cathepsin S	380	CD99-L2	489	OSCAR

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Table 4: Biomarkers clustered into 5 groups using hierarchical clustering *(continued)*

Ord	Biomarker	Ord	Biomarker	Ord	Biomarker	Ord	Biomarker	Ord	Biomarker
54	BTC	163	HCC-4	272	Legumain	381	TAFA5	490	Spinesin
55	ADAM8	164	IDO	273	GALNT3	382	SCF R	491	E-Cadherin
56	SPHK1	165	Semaphorin 4D	274	CD97	383	SIRP alpha	492	LIF R alpha
57	SR-AI	166	Axl	275	NOV	384	HGF	493	proGRP
58	LSECtin	167	GLI-3	276	JAM-A	385	Fcg RIIBC	494	Contactin-5
59	Osteoadherin	168	Neurexin 3 beta	277	MMP-13	386	FAP	495	Matrilin-2
60	Semaphorin 7A	169	Pax3	278	Glypican 3	387	FUCA1	496	ALK-1
61	IL-20 Ra	170	Calsyntenin-1	279	Flt-3L	388	BID	497	CD39L4
62	Semaphorin 6C	171	TPST2	280	Osteoactivin	389	Inhibin A	498	MeprinA
63	Presenilin 1	172	TRAIL R1	281	TF	390	ADAM9	499	SCCA2
64	AgRP	173	XIAP	282	MCSF	391	PlGF-2	500	WIF-1
65	Kremen-2	174	B3GNT2	283	bFGF	392	ILT2	501	G-CSF R
66	Cystatin D	175	Desmoglein-1	284	Albumin	393	CRIM1	502	SREC-I
67	Integrin alpha 5	176	EXTL3	285	Ferritin	394	Bora	503	CA5B
68	Netrin-4	177	DcR3	286	Cathepsin V	395	Neurocan	504	VE-Cadherin
69	FGF-23	178	Caveolin-2	287	IGFBP-5	396	IL-17 RC	505	CD300e
70	NCK1	179	Ephrin-B3	288	LAP(TGFb1)	397	LOXL2	506	EG-VEGF
71	TGFb3	180	Uromodulin	289	SPINK1	398	DPPIV	507	RGM-A
72	Desmoglein 2	181	IL-20 R beta	290	IP-10	399	CRELD2	508	AMSH
73	Syntaxin 4	182	IL-22 R alpha 1	291	ST3GAL1	400	Serpin B8	509	JAM-B
74	EphA1	183	IL-7 R alpha	292	IGF-1R	401	CD51	510	AMIGO
75	EDAR	184	Sirtuin 2	293	TNF RI	402	SDF-1a	511	VEGF R3
76	Epiregulin	185	BMP-8	294	GDF-15	403	NrCAM	512	HS3ST3B1
77	TLR3	186	Glypican 5	295	Smad4	404	GPR111	513	LAG-3
78	Glypican 2	187	JAM-C	296	SOX7	405	BAMBI	514	cMASP3
79	IL-5 Ra	188	NRG1-alpha	297	Prostasin	406	LIGHT	515	IL-17E
80	GM-CSF	189	SLITRK5	298	MAP1D	407	GPVI	516	CD6
81	CD172g	190	Glypican 1	299	Cochlin	408	CXCL16	517	Activin A
82	HE4	191	Galectin-8	300	Arginase 1	409	Calreticulin	518	CLEC-2
83	Norrin	192	IL-31 RA	301	Cystatin B	410	CDC25B	519	Cathepsin E
84	PDX-1	193	Nectin-1	302	CA13	411	IL-28A	520	FosB
85	Contactin-1	194	FABP6	303	Semaphorin 4G	412	CILP-1	521	CD109
86	CD73	195	Artemin	304	Angiogenin	413	Endocan	522	MIP-1a
87	Galectin-2	196	CD7	305	FcERI	414	FRS2	523	Troponin C
88	TARC	197	RalA	306	Transferrin	415	Calreticulin-2	524	IL-22
89	Eotaxin-3	198	Semaphorin 6D	307	IGF-2R	416	Fgr	525	LDL R
90	GCP-2	199	FGF-16	308	VAMP-1	417	Lin28	526	Kallikrein 12
91	Lymphotactin	200	ADA	309	N-Cadherin	418	HSD17B1	527	Desmocollin-3
92	MCP-2	201	Ryk	310	MDGA1	419	Numb	528	SorCS3
93	TGM3	202	TC-PTP	311	EMR2	420	Granzyme B	529	ROBO4
94	BCL-2	203	NKp30	312	AFP	421	CD39L3	530	SULT2A1
95	NKp46	204	Semaphorin 6A	313	IL-21	422	Flt-3	531	CA4
96	TGFb1	205	EphB6	314	Serpin A4	423	CD229	532	TrkC
97	htPAPP-A	206	S100A1	315	GATA-4	424	MIS RII	533	SREC-II
98	Resistin	207	OSM R beta	316	CTRC	425	COMT	534	p53
99	MCP-3	208	LTbR	317	Reg3A	426	I-TAC	535	eNOS
100	PP	209	CD11b	318	bIG-H3	427	Annexin V	536	B7-2
101	LIF	210	Nogo Receptor	319	LRIG3	428	IL-34	537	MEP1B
102	IL-9	211	MDM2	320	PEAR1	429	CD27 Ligand	538	LH
103	IL-17 RD	212	CD28	321	TIM-3	430	NUDT5	539	CD27
104	MOG	213	RGM-C	322	Reg1B	431	CA5A	540	NRG1-b1
105	TACI	214	NT-3	323	CHST4	432	HAPLN1	541	L-Selectin
106	CF XIV	215	b-NGF	324	PDGF-AA	433	TLR1	542	ADAM22
107	GH	216	Neprilysin-2	325	Siglec-10	434	Nidogen-2		
108	TRAIL	217	Kallikrein 1	326	LYVE-1	435	Jagged 1		
109	CA72-4	218	BAFF R	327	NSE	436	SH2D1A		
Cluster4									
1	CA9	36	GSTM1	71	Galectin-4	106	IL-6	141	DRAK1
2	OX40	37	CD83	72	CREG	107	MIP-1d	142	ErbB2
3	HVEM	38	VAP-A	73	p27	108	B7-1	143	VAMP-2
4	TIMP-2	39	IL-22BP	74	TREM-2	109	IL-21R	144	IL-12p70
5	ULBP-4	40	Pappalysin-2	75	PSA-total	110	GROa	145	CD23
6	Syndecan-4	41	IL-1 R3	76	UCH-L3	111	GP73	146	Ret
7	CA6	42	IFNb	77	Serpin F1	112	DNAM-1	147	GDF-8
8	UNC5H4	43	Trypsin 1	78	CD49b	113	Contactin-2	148	IL-27 Ra
9	PCSK2	44	Tie-1	79	Dectin-1	114	IL-1 F6	149	Insulin
10	ROR2	45	FCRL5	80	CD2	115	CLEC-1	150	Caspr2
11	PCK1	46	cIAP-2	81	Arylsulfatase A	116	CD34	151	Insulin R

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Table 4: Biomarkers clustered into 5 groups using hierarchical clustering *(continued)*

Ord	Biomarker	Ord	Biomarker	Ord	Biomarker	Ord	Biomarker	Ord	Biomarker
12	TRAIL R3	47	Endoglycan	82	FOLR1	117	FAM3C	152	Cardiotrophin-1
13	AKR1C4	48	DCTN1	83	MIA	118	SOX15	153	GRAP2
14	VEGF	49	Langerin	84	Visfatin	119	Olfactomedin-2	154	Carboxypeptidase A2
15	FABP2	50	HIF-1 alpha	85	Dkk-4	120	TWEAK R	155	CD4
16	CA125	51	TGFa	86	PRX2	121	Mesothelin	156	LRRTM3
17	FSH	52	FLRG	87	Aggrecan	122	Neuropilin-2	157	4-1BB Ligand
18	Reg4	53	E-Selectin	88	CrkL	123	HAI-1	158	TIMP-4
19	RCOR1	54	IL-11	89	ADAM23	124	Kallikrein 7	159	Cf10
20	TNF RII	55	Marapsin	90	DAPP1	125	Clusterin	160	Brorin
21	Kynureninase	56	Amnionless	91	GRK5	126	HAI-2	161	Nesfatin-1
22	ASAHL	57	Stabilin-2	92	MMP-12	127	IL-17B R	162	IGSF3
23	PTH1R	58	Bcl-w	93	SHP-1	128	ANG-4	163	ICAM-3
24	Cadherin-6	59	CLEC10A	94	ROBO2	129	BAFF	164	CD300f
25	NTAL	60	Semaphorin 4C	95	Contactin-3	130	FABP1	165	Granulysin
26	Midkine	61	MIP-1b	96	IL-17	131	Lipocalin-1	166	ANGPTL7
27	CD300a	62	C-myc	97	NTB-A	132	NAP-2	167	Carbonic Anhydrase XII
28	B2M	63	CEACAM-3	98	DFF45	133	KIR2DL3	168	POGLUT1
29	TIMP-1	64	Dectin-2	99	Cyr61	134	RGM-B	169	LRRC4
30	CD42b	65	Gas 1	100	Cortactin	135	MICA	170	HAO-1
31	CD320	66	Cytokeratin-8	101	CLEC9a	136	UNC5H3	171	NKp44
32	Aminopeptidase LRAP	67	THSD1	102	LRP-6	137	Activin RIB	172	CPB1
33	OX40 Ligand	68	Siglec-9	103	Epo R	138	Neurturin		
34	OMgp	69	CMG-2	104	aFGF	139	Brevican		
35	DR3	70	CD157	105	Eotaxin	140	MFRP		
Cluster5									
1	IL-1 F5	36	OPG	71	TFPI-2	106	TACE	141	IL-1b
2	MMP-1	37	PDGF-AB	72	MCP-1	107	FGF R5	142	2B4
3	ESAM	38	IFNab R2	73	ROR1	108	HCC-1	143	NKp80
4	IGFBP-1	39	VCAM-1	74	TAFA1	109	IL-17B	144	GDF-11
5	PSA-free	40	PGRP-S	75	PDGF-BB	110	IL-20	145	CD36
6	GFR alpha-1	41	MMP-9	76	C1qTNF4	111	GPR56	146	PSMA
7	DR6	42	Cathepsin L	77	MMP-10	112	CA8	147	Cathepsin B
8	IL-3	43	Pepsinogen I	78	PARC	113	FUT8	148	TLR2
9	NCAM-1	44	TFPI	79	C5a	114	IL-6R	149	Notch-1
10	Tie-2	45	Gas6	80	TSH	115	CD14	150	IL-24
11	Neuroglycan C	46	SOX2	81	Fetuin A	116	Periostin	151	HGF R
12	Leptin	47	CDO	82	CK19	117	DLL4	152	BMP-9
13	Thyroglobulin	48	Kirrel3	83	MMP-7	118	ENPP-7	153	MICB
14	Decorin	49	AMICA	84	SOX9	119	Galectin-3	154	BCMA
15	AMIGO2	50	FCRLB	85	Epimorphin	120	CD99	155	TIM-1
16	PECAM-1	51	FCRL3	86	Cystatin S	121	LIMPII	156	Follistatin
17	DSCAM	52	Syndecan-1	87	IL-18 Rb	122	IL-1 R6	157	IL-2 Rb
18	ASAH2	53	FLRT2	88	CL-P1	123	uPAR	158	TGFb2
19	Adipsin	54	CK18	89	BAI1	124	MBL	159	ANG-2
20	RBP4	55	IL-28 R alpha	90	CD69	125	CCL28	160	I-309
21	PU.1	56	CD40L	91	LEDGF	126	IGF-2	161	P-Cadherin
22	FGF-3	57	LAMA4	92	B4GalT1	127	IL-8	162	FGF-19
23	Cripto-1	58	ANG-1	93	Galectin-1	128	APRIL	163	PRELP
24	IL-18	59	KLF4	94	PDGF-CC	129	Cystatin E M	164	RANTES
25	CA15-3	60	ICAM-2	95	NQO-1	130	TSLP R	165	IL-2 Rg
26	Dkk-3	61	Serpin A5	96	CD5	131	Glycoprotein V	166	IL-17R
27	CXCL14	62	PSMA1	97	Nestin	132	IGSF4B	167	Thrombospondin-5
28	Procalcitonin	63	CA14	98	Endoglin	133	IGFBP-6	168	TPO
29	CD163	64	MMP-2	99	Fas	134	FLRT1	169	ILT4
30	Furin	65	FGF-20	100	Plexin A4	135	Chemerin	170	Trappin-2
31	MDC	66	GBA3	101	FCAR	136	IL-1 F8	171	TROP-2
32	CD200	67	IGFBP-2	102	Thrombomodulin	137	PD-1	172	IL-16
33	Adiponectin	68	DAN	103	Lumican	138	Kallikrein 14	173	SDF-1b
34	CEA	69	Podoplanin	104	HTRA2	139	IL-33	174	IL-1 F7
35	TRAIL R4	70	IL-27	105	PAR1	140	BMP-2	175	NG2

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References

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