

Table S20. GBM modules with enriched pathways in BioCarta.

Module ID	m	k	x	Gene Ontology	p-value	Genes	p-value
2	20	98	3	Atm Pathway	5.39E-04	RAD51, CHEK1, BRCA1	2.34E-02
2	18	98	8	Mcm Pathway	5.43E-13	CDT1, ORC6L, MCM2, MCM4, CDC6, MCM3, MCM7, MCM6	1.18E-10
2	23	98	4	G2 Pathway	3.24E-05	PLK1, CHEK1, BRCA1, CDC25C	2.35E-03
2	20	98	3	Atrbrca Pathway	5.39E-04	RAD51, CHEK1, BRCA1	2.34E-02
2	9	98	4	Ranms Pathway	5.04E-07	KIF15, AURKA, KPNA2, TPX2	5.47E-05
3	14	101	3	Akapcentrosome Pathway	1.95E-04	AKAP9, PRKAR2A, PCNT	4.23E-02
5	18	56	5	Mcm Pathway	1.48E-08	MCM7, CDK2, MCM2, MCM4, MCM3	3.22E-06
5	20	56	3	Atrbrca Pathway	1.03E-04	CHEK1, FANCC, RAD51	1.11E-02
8	11	73	3	Blymphocyte Pathway	3.41E-05	ICAM1, FCGR2B, PTPRC	3.70E-03
8	31	73	3	Bcr Pathway	8.51E-04	SYK, BTK, LYN	4.29E-02
8	35	73	3	Fcer1 Pathway	1.22E-03	SYK, BTK, LYN	4.29E-02
8	37	73	3	Il2Rb Pathway	1.43E-03	PTPN6, SYK, FAS	4.29E-02
8	10	73	3	Monocyte Pathway	2.49E-05	ICAM1, ITGAM, CD44	3.70E-03
8	27	73	3	Nkt Pathway	5.63E-04	CCR5, IL4R, CCR1	4.07E-02
10	18	73	6	Mcm Pathway	7.05E-10	ORC2L, CDK2, CDT1, MCM3, MCM4, MCM2	1.53E-07
10	27	73	3	G1 Pathway	5.63E-04	CDK2, SKP2, HDAC1	4.07E-02
10	12	73	3	Rb Pathway	4.52E-05	CHEK1, CDK2, MAPK14	4.91E-03
11	33	89	3	Agr Pathway	1.81E-03	PXN, JUN, MAPK1	1.87E-02
11	30	89	4	At1R Pathway	6.60E-05	SHC1, PTK2B, JUN, MAPK1	3.58E-03
11	21	89	3	Chemical Pathway	4.71E-04	BAX, PXN, BCL2L1	9.06E-03
11	39	89	3	Biopeptides Pathway	2.94E-03	SHC1, PTK2B, MAPK1	2.78E-02
11	22	89	3	Ceramide Pathway	5.43E-04	BAX, TNFRSF1A, MAPK1	9.06E-03
11	22	89	3	Cxcr4 Pathway	5.43E-04	PXN, PTK2B, MAPK1	9.06E-03
11	23	89	3	Ecm Pathway	6.21E-04	SHC1, PXN, MAPK1	9.63E-03
11	30	89	3	Fas Pathway	1.37E-03	CFLAR, FAS, JUN	1.65E-02
11	35	89	3	Fcer1 Pathway	2.15E-03	SHC1, JUN, MAPK1	2.12E-02
11	55	89	3	Hivnef Pathway	7.76E-03	CFLAR, FAS, TNFRSF1A	4.81E-02
11	37	89	6	Il2Rb Pathway	2.66E-07	SHC1, NMI, CFLAR, FAS, BCL2L1, MAPK1	5.77E-05
11	26	89	3	Raccycd Pathway	8.97E-04	IKBKB, MAPK1, CDKN1A	1.15E-02
11	34	89	4	Integrin Pathway	1.09E-04	SHC1, PXN, JUN, MAPK1	3.95E-03
11	45	89	5	Keratinocyte Pathway	1.91E-05	FAS, IKBKB, JUN, TNFRSF1A, MAPK1	2.07E-03
11	25	89	4	Pyk2 Pathway	3.13E-05	SHC1, PTK2B, JUN, MAPK1	2.27E-03
11	86	89	5	Mapk Pathway	4.28E-04	SHC1, IKBKB, JUN, RPS6KA3, MAPK1	9.06E-03
11	22	89	3	Nfkb Pathway	5.43E-04	IKBKB, TNFRSF1A, MYD88	9.06E-03
11	25	89	3	Bad Pathway	7.98E-04	BAX, BCL2L1, MAPK1	1.08E-02
11	16	89	3	Pml Pathway	2.04E-04	FAS, TNFRSF1A, SP100	5.53E-03
11	31	89	3	Il1R Pathway	1.51E-03	IKBKB, JUN, MYD88	1.72E-02
11	34	89	4	Met Pathway	1.09E-04	PXN, PTK2B, JUN, MAPK1	3.95E-03
11	16	89	3	Spry Pathway	2.04E-04	SHC1, SPRY1, MAPK1	5.53E-03
11	25	89	3	Stress Pathway	7.98E-04	IKBKB, JUN, TNFRSF1A	1.08E-02
11	32	89	3	Toll Pathway	1.66E-03	IKBKB, JUN, MYD88	1.80E-02
16	20	93	4	Atm Pathway	1.47E-05	CHEK1, CHEK2, RAD51, BRCA1	7.97E-04
16	18	93	5	Mcm Pathway	1.95E-07	CDC6, CDT1, MCM4, ORC1L, CDK2	2.12E-05
16	27	93	3	G1 Pathway	1.14E-03	SKP2, CDK2, CDC25A	3.54E-02
16	23	93	6	G2 Pathway	1.64E-08	CHEK1, CHEK2, PLK1, BRCA1, CDC25C, CDC25A	3.55E-06

16	12	93	3	Rb Pathway	9.33E-05	CHEK1, CDC25C, CDK2	3.37E-03
16	20	93	5	Atrbrca Pathway	3.49E-07	CHEK1, CHEK2, RAD51, BRCA2, BRCA1	2.52E-05
16	9	93	3	Ranms Pathway	3.62E-05	AURKA, KIF15, TPX2	1.57E-03
17	14	59	3	Plateletapp Pathway	3.91E-05	PLAU, COL4A2, SERPINE1	8.49E-03
20	10	74	3	Gaba Pathway	2.59E-05	GABRA1, DNMI, GABRA5	5.62E-03
24	55	38	3	Hivnef Pathway	6.79E-04	RIPK1, NFKB1, PRKCD	3.21E-02
24	45	38	3	Keratinocyte Pathway	3.75E-04	RIPK1, NFKB1, PRKCD	3.21E-02
24	86	38	3	Mapk Pathway	2.48E-03	RIPK1, TGFBR1, NFKB1	3.84E-02
24	24	38	4	Nthi Pathway	8.56E-07	TGFBR1, TGFBR2, NFKB1, TLR2	1.86E-04
25	12	75	3	Fibrinolysis Pathway	4.90E-05	PLAU, SERPINE1, F13A1	1.06E-02
32	22	71	4	Mtor Pathway	7.49E-06	PDPK1, EIF3A, RPS6KB1, EIF4G3	1.63E-03
32	22	71	3	Eif4 Pathway	2.79E-04	PDPK1, RPS6KB1, EIF4G3	3.03E-02
40	18	84	6	Mcm Pathway	1.67E-09	CDT1, MCM2, MCM7, MCM4, CDK2, MCM3	3.62E-07
40	23	84	3	G2 Pathway	5.24E-04	CHEK1, BRCA1, PLK1	3.79E-02
40	20	84	4	Atrbrca Pathway	9.80E-06	FANCC, CHEK1, BRCA2, BRCA1	1.06E-03
41	17	68	3	Il10 Pathway	1.11E-04	IL10RA, HMOX1, IL6	2.40E-02
49	13	41	3	Thelper Pathway	1.02E-05	CD4, ITGB2, PTPRC	2.22E-03
51	35	88	4	Fcer1 Pathway	1.17E-04	SYK, FCER1G, LYN, PIK3CG	8.48E-03
51	25	88	3	Bad Pathway	7.72E-04	RPS6KA1, CSF2RB, PIK3CG	4.19E-02
51	13	88	3	Thelper Pathway	1.02E-04	PTPRC, ITGB2, CD4	8.48E-03
51	32	88	4	Toll Pathway	8.19E-05	LY96, TLR2, CD14, TLR7	8.48E-03