

Supplemental Table 2b - MEM Labels for Enriched Features in CD4+ T cell Hotspots from COVID-19 Patients in Dataset 2

patient_id	degree_change	direction_change	DBSCAN_cluster	total_counts	Marker Enrichment Modeling (MEM) Label
COV24	2.053	1.000	1	81	2401095 : ▲ CD147+10 CD99+9 CD29+8 CD38+6 CD49d+4 CD3+4 CD81+2 CD52+2 CD56+2 CD28+2 CD55+1 CD137+1 CD62L+1 CD5+1 CD4+1 ▼ None
			2	1	2402095 : ▲ CD99+10 CD147+9 CD29+8 CD3+5 CD27+5 CD38+5 CD28+3 CD81+2 CD52+2 CD62L+2 CD56+2 CD5+2 CD45+1 CD43+1 CD45RB+1 CD7+1 CD4+1 ▼ None
COV26	N/A	N/A	N/A	N/A	N/A
COV27	N/A	N/A	N/A	N/A	N/A
COV29	1.464	1.000	1	22	2901095 : ▲ CD147+10 CD29+8 CD99+8 CD38+7 CD49d+5 CD3+5 CD39+5 CD45+4 CD81+4 CD62L+4 CD28+4 CD55+3 CD56+3 HLA-DR+2 CD52+2 CD25+2 CD137+2 CD43+1 CD161+1 CD27+1 CD8a+1 CD5+1 CD4+1 ▼ None
			2	186	2902095 : ▲ CD147+8 CD29+7 CD99+7 CD27+5 CD38+5 CD45+4 CD3+4 CD49d+3 CD52+3 CD28+3 CD81+2 CD62L+2 CD56+2 CD5+2 HLA-DR+1 CD43+1 CD55+1 CD161+1 CD137+1 CD8a+1 CD4+1 ▼ None
COV32	23.022	-0.045	1	282	320105 : ▲ CD3+6 CD27+5 CD45RA+5 CD45+4 CD147+4 CD52+3 CD55+3 CD99+3 CD43+2 CD45RB+2 CD81+2 CD29+2 CD62L+2 CD127+2 CD38+2 CD5+2 CD28+1 CD8a+1 CD4+1 ▼ None
			2	506	320205 : ▲ CD57+6 CD29+6 CD99+6 CD43+5 CD3+5 CD147+5 CD45+4 CD45RA+4 CD81+3 CD52+3 CD49d+2 CD5+2 CD45RB+1 CD127+1 CD38+1 CD56+1 CD8a+1 CD4+1 ▼ None
			3	45	320305 : ▲ CD45+5 CD29+5 CD27+5 CD147+5 CD3+4 CD52+4 CD99+4 CD127+3 CD43+2 CD81+2 CD62L+2 CD5+2 CD45RB+1 CD55+1 CD38+1 CD28+1 CD8a+1 CD7+1 CD4+1 ▼ None
			5	73	320505 : ▲ CD29+7 CD147+5 CD99+5 CD45+4 CD43+4 CD3+4 CD81+3 CD52+3 CD127+3 CD49d+2 CD5+2 CD161+1 CD137+1 CD56+1 CD8a+1 CD4+1 ▼ None
			7	42	320705 : ▲ CD147+10 CD99+6 CD39+6 CD3+5 CD29+5 CD45+4 CD52+3 CD25+3 CD27+3 CD28+3 CD62L+2 CD38+2 CD56+2 CD5+2 CD43+1 CD55+1 CD4+1 ▼ None
			4	73	3204095 : ▲ CD99+9 CD57+8 CD29+8 CD43+6 CD147+6 CD5+5 CD45+4 CD3+4 CD81+4 CD52+4 CD49d+3 CD45RB+1 CD161+1 CD137+1 CD127+1 CD56+1 CD8a+1 CD4+1 ▼ None
			6	292	3206095 : ▲ CD99+10 CD29+9 CD147+9 CD27+7 CD45+5 CD3+5 CD52+5 CD38+5 CD49d+4 CD28+4 CD43+2 CD81+2 CD62L+2 CD56+2 CD5+2 CD4+2 CD45RB+1 CD55+1 CD161+1 CD137+1 CD127+1 CD8a+1 CD7+1 ▼ None
			8	40	3208095 : ▲ CD99+7 CD3+6 CD27+6 CD147+5 CD45+4 CD81+4 CD52+4 CD45RA+4 CD43+3 CD45RB+3 CD55+3 CD29+3 CD7+3 CD62L+2 CD38+2 CD28+2 CD5+2 CD4+2 CD49d+1 CD127+1 CD8a+1 ▼ None
			9	286	3209095 : ▲ CD99+9 CD57+8 CD29+8 CD43+6 CD147+6 CD3+5 CD56+5 CD81+4 CD52+4 CD45RA+4 CD45+3 CD49d+3 CD5+2 CD45RB+1 CD137+1 CD38+1 CD8a+1 CD4+1 ▼ None
			10	44	32010095 : ▲ CD99+9 CD57+8 CD29+8 CD147+7 CD43+5 CD45+4 CD3+4 CD81+4 CD52+4 CD49d+3 CD38+2 CD5+2 CD45RB+1 CD161+1 CD137+1 CD127+1 CD56+1 CD8a+1 CD4+1 ▼ None
			11	108	32011095 : ▲ CD45RA+8 CD99+7 CD3+6 CD27+6 CD147+5 CD45+4 CD45RB+4 CD52+4 CD43+3 CD81+3 CD55+3 CD29+3 CD38+3 CD7+3 CD62L+2 CD28+2 CD5+2 CD127+1 CD56+1 CD8a+1 CD4+1 ▼ None
			12	22	32012095 : ▲ CD99+9 CD57+8 CD29+7 CD43+6 CD45RA+6 CD3+5 CD147+5 CD81+4 CD52+4 CD45+3 CD49d+3 CD45RB+2 CD5+2 CD137+1 CD56+1 CD8a+1 CD4+1 ▼ None
COV34	1.093	0.472	1	41	3401095 : ▲ CD99+10 CD29+9 CD27+8 CD147+6 CD127+5 CD45+4 CD43+4 CD3+4 CD52+4 CD62L+4 CD5+4 CD81+3 CD55+2 CD28+2 CD7+2 CD4+2 CD45RB+1 CD137+1 CD56+1 CD8a+1 ▼ None
			3	26	3403095 : ▲ CD29+9 CD99+9 CD27+7 CD3+6 CD147+6 CD45+4 CD52+4 CD62L+4 CD45RA+4 CD43+3 CD45RB+3 CD81+3 CD55+2 CD127+2 CD28+2 CD8a+2 CD5+2 CD7+2 CD25+1 CD161+1 CD137+1 CD56+1 CD4+1 ▼ None
			2	18	340205 : ▲ CD99+7 CD27+6 CD147+5 CD45+4 CD3+4 CD52+4 CD62L+4 CD38+3 CD43+2 CD45RB+2 CD81+2 CD55+2 CD29+2 CD127+2 CD8a+2 CD5+2 CD56+1 CD28+1 CD7+1 CD4+1 ▼ None
COV35	N/A	N/A	N/A	N/A	N/A
COV36	N/A	N/A	N/A	N/A	N/A
COV37	N/A	N/A	N/A	N/A	N/A
COV39	0.474	1.000	1	44	3901095 : ▲ CD29+10 CD147+10 CD99+10 CD45+6 CD49d+4 CD3+4 CD27+4 CD52+3 CD28+3 CD38+2 CD81+1 CD137+1 CD62L+1 CD56+1 CD5+1 CD4+1 ▼ None
			2	11	3902095 : ▲ CD99+10 CD29+9 CD147+8 CD45+6 CD3+4 CD49d+3 CD52+3 CD38+3 CD27+2 CD28+2 CD81+1 CD137+1 CD56+1 CD5+1 CD4+1 ▼ None
COV40	N/A	N/A	N/A	N/A	N/A
COV41	N/A	N/A	N/A	N/A	N/A

\*Red MEM labels denote that the CD4+ T cell hotspot is a region with ≥95% expansion and blue MEM labels denote that the CD4+ T cell hotspot is a region with ≥95% contraction after T-REX analysis when comparing Day 0 to Day 4 (±3 days)