

Supplemental Tables

CD151 expression promotes a hyperproliferative T cell phenotype

Lillian Seu, Christopher Tidwell, Laura Timares, Alexandra Duverger, Frederic H. Wagner, Paul A. Goepfert, Andrew Westfall, Steffanie Sabbaj, Olaf Kutsch

Department of Medicine, University of Alabama at Birmingham, Birmingham, Alabama

The following tables provide the kinome array data used for GO-motif analysis and the generation of the presented protein-protein interaction networks.

Supplemental Table I: Baseline differences in the protein networks of CD151- and CD151+ T cells

Antibody Codes	Target Protein Name	Phospho Site (Human)	Full Target Protein Name	CD151-	CD151+	Z-ratio	Uniprot Link	Phosphorylation	MAPK cascade	Cell death	Cell proliferation
1	PK154	IKKa	T23	Inhibitor of NF-kappa-B protein-serine kinase alpha (CHUK)	3160	864	-3.86	Q15111			
2	PK050	MEK2 mouse	T394	MAPK/ERK protein-serine kinase 2 (MKK2) (mouse)	12581	3635	-3.68	P36507			
3	NN038-1	eIF2a	Pan-specific	Eukaryotic translation initiation factor 2 alpha	4224	1571	-2.92	P05198			
4	PK097-3	PYK2	Y579	Protein-tyrosine kinase 2	1538	595	-2.81	Q14289			
5	NK105-1	MEK6	Pan-specific	MAPK/ERK protein-serine kinase 6 (MKK6)	1402	547	-2.79	P52564			
6	NP001	CD45	Pan-specific	Leukocyte common antigen CD45 receptor-tyrosine phosphatase (LCA, T200)	2529	984	-2.79	P08575			
7	PN162	Catenin a	S641	Catenin (cadherin-associated protein) alpha	1476	590	-2.71	P35221			
8	PK072-1	Akt1 (PKBa)	S473	RAC-alpha serine/threonine-protein kinase	5885	2356	-2.69	P31749			
9	PK020-3	FAK	S722	Focal adhesion protein-tyrosine kinase	2531	1043	-2.61	Q06397			
10	PN114	4E-BP1	T45	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	1865	771	-2.61	Q13541			
11	PK162	Chk1	S280	Checkpoint protein-serine kinase 1	3220	1340	-2.58	Q14757			
12	NN013	Caspase 3	Pan-specific	Caspase 3 (apoptain, cysteine protease CPP32)	1125	471	-2.58	P42574			
13	PN188	HDAC5	S498	Histone deacetylase 5	1972	830	-2.55	Q9UOL6			
14	PK049	MEK2	T394	MAPK/ERK protein-serine kinase 2 (MKK2)	2211	988	-2.37	P36507			
15	NK079	Insulin Recept	Pan-specific	Insulin receptor beta chain	872	398	-2.32	P06213			
16	NN108	STH1	Pan-specific	Stress induced phosphoprotein 1 (Hsc70/Hsp90 organizing protein (Hop))	1527	708	-2.26	P31948			
17	NN006-1	BCL	Pan-specific	B-cell lymphoma protein 2 alpha	975	456	-2.24	P10415			
18	PK049-2	MEK2 human	T394	MAPK/ERK protein-serine kinase 2 (MKK2)	2502	1167	-2.24	P36507			
19	NN023	Cdc34	Pan-specific	Cell division cycle 34 (ubiquitin-conjugating ligase)	3224	1737	-1.79	P49427			
20	NN098	SOD (Cu/Zn)	Pan-specific	Superoxide dismutase 1	1990	1089	-1.75	Q8ND84			
21	NK140	PKCt	Pan-specific	Protein-serine kinase C theta	1704	938	-1.74	Q04759			
22	NN021	Catenin b	Pan-specific	Catenin (cadherin-associated protein) beta 1	24504	13673	-1.67	P35222			
23	NK102	MEK3b	Pan-specific	MAPK/ERK protein-serine kinase 3 beta isoform (MKK3 beta)	928	526	-1.65	P46734			
24	PN159	p53	S37	Tumor suppressor protein p53 (antigenNY-CO-13)	5247	2980	-1.63	P04637			
25	NK099-1	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	1698	988	-1.57	Q02750			
26	NN162	Jun	Pan-specific	Jun proto-oncogene-encoded AP1 transcription factor	1314	768	-1.56	P05412			
27	NN102-NN124	STAT1	Pan-specific	Signal transducer and activator of transcription 1 alpha	10892	6371	-1.53	P42224			
28	NK025-2	CDK1	Pan-specific	Cyclin-dependent protein-serine kinase 1	2666	1590	-1.49	P06493			
29	NN110	TRADD	Pan-specific	Tumor necrosis factor receptor type 1 associated DEATH domain protein	1533	917	-1.49	Q15628			
30	PN115	ATF2	S94/S112	Activating transcription factor 2 (CRE-BP1)	2146	1287	-1.47	P15336			
31	PK165	CDK6	Y13	Cyclin-dependent protein-serine kinase 6	1145	689	-1.47	Q00534			
32	PK093-1	PKCm (PKD)	S916	Protein-serine kinase C mu (Protein kinase D)	9105	5520	-1.42	P15139			
33	PN171	c-Cbl	Y700	Signal transduction protein CBL	1043	639	-1.41	P22681			
34	PK072-3	Akt1 (PKBa)	S473	RAC-alpha serine/threonine-protein kinase	1275	783	-1.40	P31749			
35	NK141	PKCz	Pan-specific	Protein-serine kinase C zeta	8662	5320	-1.38	Q05513			
36	NN083	p107	Pan-specific	Retinoblastoma (Rb) protein-related p107 (PRB1)	3979	2495	-1.33	P28749			
37	PK143	ASK1	S966	Apoptosis signal regulating protein-serine kinase 1	1131	722	-1.29	Q59GL6			
38	PN057-2	p53	S392	Tumor suppressor protein p53 (antigenNY-CO-13)	2082	1328	-1.29	P04637			
39	NP004	KAP	Pan-specific	Cyclin-dependent kinase associated phosphatase (CDK inhibitor 3, CIP2)	22327	14155	-1.28	Q16667			
40	PN082-1	STAT3	Y704	Signal transducer and activator of transcription 3	7204	4587	-1.28	P40763			
41	NN095	Smac/DIABLO	Pan-specific	Second mitochondria-derived activator of caspase	1049	675	-1.27	Q8NR28			
42	PN143	PLCg2	Y753	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase gamma-2	1565	1014	-1.24	P16885			
43	PN164	IkBa	Y42	Inhibitor of NF-kappa-B alpha (MAD3)	493	324	-1.21	P25963			
44	PK663	InsR	Y1189	INSR insulin receptor	3910	2558	-1.20	P06213			
45	NK101-3	MEK3	Pan-specific	MAPK/ERK protein-serine kinase 3 beta isoform (MKK3 beta)	13267	8677	-1.19	P46734			
46	NK249-2	SIK2	Pan-specific	Serine/threonine-protein kinase SIK2	22760	14927	-1.17	Q9H0K1			
47	NN104	STAT3	Pan-specific	Signal transducer and activator of transcription 3	6358	4207	-1.16	P40763			
48	PK089-1	PKCt	S676	Protein-serine kinase C theta	1329	886	-1.16	Q04759			
49	PN166	Catenin b	S33	Catenin (cadherin-associated protein) beta 1	1484	990	-1.15	P35222			
50	PK090-1	PKCt	S695	Protein-serine kinase C theta	1272	850	-1.15	Q04759			
51	PN079-PM136	STAT1	Y701	Signal transducer and activator of transcription 1 alpha	3512	2343	-1.14	P42224			
52	PN101-2	Histone H3	T3	Histone H3.3	5549	3718	-1.12	P84243			
53	NN121	Arrestin b	Pan-specific	Arrestin beta 1	1986	1350	-1.09	P49407			
54	NP018	PP2Cd	Pan-specific	Protein-serine phosphatase 2C - catalytic subunit - delta isoform	1136	777	-1.08	Q15297			
55	PK055-1	Met	T330/Y1234/Y12	Hepatocyte growth factor (HGF) receptor-tyrosine kinase	1384	948	-1.07	P08581			
56	PN078-PM135	STAT1	S727	Signal transducer and activator of transcription 1 alpha	1752	1201	-1.07	P42224			
57	PK072-5	Akt1 (PKBa)	S473	RAC-alpha serine/threonine-protein kinase	10007	6836	-1.06	P31749			
58	PK158	RSK1	T348	Ribosomal S6 protein-serine kinase 1	3002	2065	-1.05	Q15418			
59	PN009	B23 (NPM)	T234/237	B23 (nucleophosmin, numatrin, nucleolar protein NO38)	1682	1169	-1.03	Q06748			
60	NK027	CDK4	Pan-specific	Cyclin-dependent protein-serine kinase 4	21337	14729	-1.02	P11802			
61	PK152	IGF1R	Y1280	Insulin-like growth factor 1 receptor protein-tyrosine kinase	4019	2799	-1.01	P08069			
62	PK122-1	EGFR	Y1068	Epidermal growth factor receptor-tyrosine kinase	2221	1553	-1.00	P00533			
63	PK079-1	PKCd	S645	Protein-serine kinase C delta	2709	3667	1.01	Q05655			
64	NN153	KDEL Recept	Pan-specific	ER lumen protein retaining receptor 1	5389	7308	1.03	P24390			
65	PK101-2	RSK1/2	S380/S386	Ribosomal S6 protein-serine kinase 1/2	1831	2549	1.09	Q15418			
66	NN141-1	PDI	Pan-specific	Protein disulfide-isomerase	21029	29083	1.10	P07237			
67	PN116	BRCa1	S1423	Breast cancer type 1 susceptibility protein	2969	4147	1.11	P38398			
68	NN166	4E-BP1	Pan-specific	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	770	1095	1.15	Q13541			
69	NK150	B-Raf	Pan-specific	RafB proto-oncogene-encoded protein-serine kinase	7108	10093	1.17	P15056			
70	NK099-8	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	28486	40417	1.18	Q02750			
71	PN022-2	Cortactin	Y466	Cortactin (amplixin) (mouse)	3301	4752	1.20	Q14247			
72	PN041	Hsp27	S78	Heat shock 27 kDa protein beta 1 (HspB1)	13085	18808	1.21	Q04792			
73	PK587	CSF1R	Y699	Macrophage colony-stimulating factor 1 receptor	1216	1772	1.23	P07333			
74	NN028	Cyclin A	Pan-specific	Cyclin A1	25347	36646	1.24	P78396			
75	PN051-1	MLC	S19	Myosin regulatory light chain 2, smooth muscle isoform	6578	9620	1.26	P19105			
76	PK549	BRSK1	T189	BR serine/threonine-protein kinase 1	3830	5676	1.29	Q8TDC3			
77	PN036	Histone H2A.X	S139	Histone H2A variant X	894	1351	1.34	P16104			
78	PK732	Nek2	S171	NIMA (never-in-mitosis)-related protein-serine kinase 2	17408	26052	1.34	P51955			
79	NN075	NTSE	Pan-specific	Ecto-5'-nucleotidase (CD73 antigen)	5838	8787	1.34	P21589			
80	PK867	ERK1	S74	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	5451	8341	1.39	P27361			
81	NN136-2	Calnexin	Pan-specific	Calnexin	29173	44503	1.40	P27824			
82	NN080	p27 Kip1	Pan-specific	p27 cyclin-dependent kinase inhibitor 1B	5231	8101	1.43	P48627			
83	NK227-2	LKB1	Pan-specific	Serine/threonine-protein kinase 11	22829	35307	1.44	Q15831			
84	NK137	PKCg	Pan-specific	Protein-serine kinase C gamma	9980	15512	1.45	P05129			
85	NK181-4	TYK2	Pan-specific	Protein-tyrosine kinase 2 (Jak-related)	27398	43928	1.55	P28597			
86	PN028-1	eIF2a	S52	Eukaryotic translation initiation factor 2 alpha	3192	5218	1.59	P05198			
87	NN030-1	Cyclin D1	Pan-specific	Cyclin D1 (PRAD1)	9954	16296	1.61	P24385			
88	NN131	I2PP2A (PHAF)	Pan-specific	Protein SET	17650	28878	1.61	Q01105			
89	PN049-PM112-2	MAPKAPK2	T334	Mitogen-activated protein kinase-activated protein kinase 2 alpha	1402	2354	1.66	P49137			
90	NN149-2	Crystallin aB	Pan-specific	Crystallin alpha B (heat-shock 20 kDa like-protein)	3925	6599	1.68	P02511			
91	PN003-PM004	Adducin a/g	S662	Adducin alpha (ADD1)	3710	6251	1.68	P35611			
92	NK136-2	PKCe	Pan-specific	Protein-serine kinase C epsilon	4913	8314	1.70	Q02156			
93	NK022	CaMKK	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase kinase	4886	8350	1.73	Q8N5S9			
94	PK102	RSK1/2/3	T573	Ribosomal S6 protein-serine kinase 1/2/3	315	560	1.82	Q15418			
95	NK019-2	CAMK2d	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase 2 delta	2324	4156	1.86	Q13557			
96	NK014	Btk	Pan-specific	Bru-1's agammaglobulinemia tyrosine kinase	10228	18418	1.90	Q06187			
97	PK073	PKCa	S657	Protein-serine kinase C alpha	3917	7650	2.13	P17262			
98	NK135	PKCd	Pan-specific	Protein-serine kinase C delta	6982	13787	2.17	Q05655			
99	PN155	Jun	Y170	Jun proto-oncogene-encoded AP1 transcription factor	672	1458	2.43	P05412			
100	NN155	MEF-2	Pan-specific	Myelin expression factor 2 (MYEF2)	5073	11199	2.51	Q9P2K5			
101	PK100-2	RSK1/2	S363/S369	Ribosomal S6 protein-serine kinase 1/2	1208	2782	2.62	Q15418			
102	NK120-2	p38a (MAPK 1)	S363/S369	Mitogen-activated protein-serine kinase p38 alpha	11425	26141	2.63	Q16539			
103	PK075-2	PKCb1/2	T500	Protein-serine kinase C beta 1/2	913	2490	3.14	P05771			
104	PN030-2	eIF4E	S209	Eukaryotic translation initiation factor 4 (mRNA cap binding protein)	500	1531	3.48	P06730			

Supplemental Table II: Proteins that are differentially regulated in response to IL-2 in CD151- CD4+ T cells

Serial No.	Antibody Codes	Target Protein Name	Phospho Site (Human)	Full Target Protein Name	CD151-	CD151+ IL-2	Z-ratio	Uniprot Link	Phosphorylation	MAPK cascade	Cell death	Cell proliferation
1	174	PN023	CREB1	S129/S133	cAMP response element binding protein 1	3469	233	-2.81	P16220			
2	435	PN154	Jun	S243	Jun proto-oncogene-encoded AP1 transcription factor	568	51	-2.46	P05412			
3	321	PN196	GATA1	S142	Erythroid transcription factor	711	105	-1.96	P15976			
4	137	NK026-7	CDK2	Pan-specific	Cyclin-dependent protein-serine kinase 2	12506	2560	-1.69	P24941			
5	62	NN006-1	BCL	Pan-specific	B-cell lymphoma protein 2 alpha	975	220	-1.53	P10416			
6	242	PN172	eIF4B	S422	Eukaryotic translation initiation factor 4B	1722	404	-1.50	P23598			
7	3	PN114	4E-BP1	T45	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	1865	486	-1.39	Q13541			
8	154	PK162	Chk1	S280	Checkpoint protein-serine kinase 1	3220	875	-1.36	Q14767			
9	701	PN062	PRAS40	T246	Proline-rich Akt substrate 40 kDa (Akt1S1)	2041	588	-1.29	Q96B36			
10	729	PN064	Rad17	S645	Rad17 homolog	1207	343	-1.29	Q75943			
11	354	NN054	Hsc70	Pan-specific	Heat shock 70 kDa protein 8	8558	2595	-1.28	P33778			
12	728	PN063	Rac1/cdc42	S71	Ras-related C3 botulinum toxin substrate 1	627	185	-1.24	P63000			
13	813	NN105	STAT5A	Pan-specific	Signal transducer and activator of transcription 5A	21244	7007	-1.21	P42229			
14	123	NN023	Cdc34	Pan-specific	Cell division cycle 34 (ubiquitin-conjugating ligase)	3224	1037	-1.19	P49427			
15	817	NN108	ST11	Pan-specific	Stress induced phosphoprotein 1 (Hsc70/Hsp90 organizing protein (Hop))	1527	481	-1.19	P31948			
16	695	NP018	PP2Cd	Pan-specific	Protein-serine phosphatase 2C - catalytic subunit - delta isoform	1136	364	-1.17	Q15297			
17	166	PN019	Cofilin 1	S3	Cofilin 1	1603	523	-1.16	P23528			
18	513	PK055-1	Met	Y1230/Y1234/N	Hepatocyte growth factor (HGF) receptor-tyrosine kinase	1384	451	-1.15	P08581			
19	428	NK217	JNK1	Pan-specific	Jun N-terminus protein-serine kinase (stress-activated protein kinase (SAPK)) 1	1062	350	-1.14	P45983			
20	854	PK133	VEGFR2	Y1214	Vascular endothelial growth factor receptor-tyrosine kinase 2 (Flk1)	1321	436	-1.14	P35968			
21	47	PN115	ATF2	S94/S112	Activating transcription factor 2 (CRE-BP1)	2146	727	-1.13	P15336			
22	725	PK097-3	PYK2	Y579	Protein-tyrosine kinase 2	1538	516	-1.13	Q14289			
23	250	PN170	Elk1	S389	ETS domain-containing protein Elk-1	1241	417	-1.12	P19419			
24	58	PN009	B23 (NPM)	T234/237	B23 (nucleophosmin, numatrin, nucleolar protein NO38)	1682	586	-1.09	P06748			
25	610	NK200-2	PAKq	Pan-specific	p21-activated kinase 2 (gamma) (serine/threonine-protein kinase PAK 2)	11133	4059	-1.09	Q13177			
26	760	PK157	RSK1	S352	Ribosomal S6 protein-serine kinase 1	2104	739	-1.09	Q15418			
27	434	NN162	Jun	Pan-specific	Jun proto-oncogene-encoded AP1 transcription factor	1314	460	-1.08	P05412			
28	132	PK008-1	CDK1/CDC2	T161	Cyclin-dependent protein-serine kinase 1/2	1167	424	-1.04	P06493			
29	606	PK061	PAK1/2/3	S144/S141/S15	p21-activated kinase 1 (alpha) (serine/threonine-protein kinase PAK 1)	1177	429	-1.03	Q13153			
30	455	PK041	Lck	Y505	Lymphocyte-specific protein-tyrosine kinase	2058	786	-1.00	P06239			
31	652	NK135	PKCd	Pan-specific	Protein-serine kinase C delta	6982	12572	1.01	Q05655			
32	650	PK075-2	PKCb1/2	T500	Protein-serine kinase C beta 1/2	913	1597	1.04	P05771			
33	361	PN041	Hsp27	S78	Heat shock 27 kDa protein beta 1 (HspB1)	13085	24743	1.07	P04792			
34	175	PN024	CREB1	S133	cAMP response element binding protein 1	28402	55552	1.09	P16220			
35	765	PK101-2	RSK1/2	S380/S386	Ribosomal S6 protein-serine kinase 1/2	1831	3410	1.13	Q15418			
36	764	PK100-2	RSK1/2	S363/S369	Ribosomal S6 protein-serine kinase 1/2	1208	2262	1.15	Q15418			
37	458	NK227-2	LKB1	Pan-specific	Serine/threonine-protein kinase 11	22829	46279	1.17	Q15831			
38	93	NK022	CaMKK	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase kinase	4886	9956	1.24	Q8N559			
39	78	PN116	BRCA1	S1423	Breast cancer type 1 susceptibility protein	2969	6047	1.27	P38398			
40	459	NK227-3	LKB1	Pan-specific	Serine/threonine-protein kinase 11	38399	84264	1.29	Q15831			
41	203	NP006-2	DUSP1 (MKP1)	Pan-specific	MAP kinase phosphatase 1 (CL100, VH1)	30957	69448	1.34	P28562			
42	763	PK100	RSK1/2	S363/S369	Ribosomal S6 protein-serine kinase 1/2	2153	4525	1.34	Q15418			
43	470	NN155	MEF-2	Pan-specific	Myelin expression factor 2 (MYEF2)	5073	11024	1.36	Q9P2K5			
44	74	NK156-4	B-Raf	Pan-specific	RafB proto-oncogene-encoded protein-serine kinase	20719	47428	1.39	P15056			
45	757	NK163-3	Ros	Pan-specific	Orosomucoid 1 receptor-tyrosine kinase	26933	62397	1.40	P08922			
46	265	NK055-2	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	37157	88687	1.44	P27361			
47	89	NK019-2	CAMK2d	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase 2 delta	2324	5252	1.46	Q13557			
48	364	NN057-3	Hsp40	Pan-specific	DnaJ homolog, subfamily B member 1	18087	42856	1.46	P25685			
49	852	NN176	VEGF-C	Pan-specific	Vascular endothelial growth factor C	5256	12440	1.51	P49767			
50	847	NK181-4	TYK2	Pan-specific	Protein-tyrosine kinase 2 (Jak-related)	27398	68594	1.54	P29597			
51	84	PN015	Caldesmon	S789	Caldesmon	3777	9038	1.55	Q05682			
52	266	NK055-3	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	37206	94331	1.55	P27361			
53	456	NK093	LIMK1	Pan-specific	LIM domain kinase 1	4188	10057	1.55	P53667			
54	474	NK099-8	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	28486	71897	1.55	Q02750			
55	846	NK181-3	TYK2	Pan-specific	Protein-tyrosine kinase 2 (Jak-related)	30973	79263	1.57	P29597			
56	647	PK073	PKCa	S657	Protein-serine kinase C alpha	3917	9721	1.61	P17252			
57	653	PK079-1	PKCd	S645	Protein-serine kinase C delta	2709	6680	1.62	Q05655			
58	758	NK163-4	Ros	Pan-specific	Orosomucoid 1 receptor-tyrosine kinase	26710	71085	1.65	P08922			
59	264	NK055-1	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	31582	88820	1.74	P27361			
60	463	PK044	MAPKAPK2	T222	Mitogen-activated protein kinase-activated protein kinase 2	5182	14309	1.79	P49137			
61	460	NK227-4	LKB1	Pan-specific	Serine/threonine-protein kinase 11	29746	88318	1.84	Q15831			
62	187	PN190	Cyclin B1	S147	Cyclin B1	3137	10644	2.19	P14635			
63	79	PN014	BRCA1	S1497	Breast cancer type 1 susceptibility protein	6499	24876	2.37	P38398			

Supplemental Table III: Proteins that are differentially regulated in response to IL-2 in CD151+ CD4+ T cells

Serial No.	Antibody Codes	Target Protein Name	Phospho Site (Human)	Full Target Protein Name	CD151+	CD151+ +IL-2	Z-ratio	Uniprot Link	Phosphorylation	MAPK cascade	Cell death	Cell proliferation
1	174	PN023	CREB1	S129/S133	cAMP response element binding protein 1	4048	620	-2.63	P16220			
2	312	PN195	FKHR	S319	Forkhead box protein O1	531	85	-2.54	Q12778			
3	245	PN030-2	eIF4E	S209	Eukaryotic translation initiation factor 4 (mRNA cap binding protein)	1531	273	-2.41	P06730			
4	709	PN104	Progesterone R	S294	Progesterone receptor	623	122	-2.27	P06401			
5	137	NK026-7	CDK2	Pan-specific	Cyclin-dependent protein-serine kinase 2	13424	3482	-1.93	P24941			
6	534	NK111	Mnk2	Pan-specific	MAP kinase-interacting protein-serine kinase 2 (calmodulin-activated)	3973	1139	-1.78	Q9JHB9			
7	46	PK143	ASK1	S966	Apoptosis signal regulating protein-serine kinase 1	722	206	-1.76	Q59GL6			
8	248	NN168	Elk1	Pan-specific	ETS domain-containing protein Elk-1	940	269	-1.76	P19419			
9	701	PN062	PRAS40	T246	Proline-rich Akt substrate 40 kDa (Akt1S1)	2057	604	-1.74	Q98B36			
10	97	NN016	Caspase 6	Pan-specific	Caspase 6 (apoptotic protease Mch2)	996	301	-1.69	P55212			
11	242	PN172	eIF4B	S422	Eukaryotic translation initiation factor 4B	1664	516	-1.66	P23588			
12	439	PN155	Jun	Y170	Jun proto-oncogene-encoded AP1 transcription factor	1458	455	-1.65	P05412			
13	143	NK028-5	CDK5	Pan-specific	Cyclin-dependent protein-serine kinase 5	14047	4821	-1.55	Q00535			
14	729	PN064	Rad17	S645	Rad17 homolog	1010	348	-1.51	Q75943			
15	250	PN170	Elk1	S389	ETS domain-containing protein Elk-1	1026	361	-1.49	P19419			
16	760	PK157	RSK1	S352	Ribosomal S6 protein-serine kinase 1	1860	682	-1.44	Q15418			
17	734	NN093	Rb	Pan-specific	Retinoblastoma-associated protein 1	1724	633	-1.43	P06400			
18	147	NK030-2	CDK7	Pan-specific	Cyclin-dependent protein-serine kinase 7	11993	4557	-1.41	P50613			
19	3	PN114	4E-BP1	T45	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	771	290	-1.39	Q13541			
20	548	PN182	MyoD	S200	Myoblast determination protein 1	1038	394	-1.38	P15172			
21	66	PK061	PAK1/2/3	S144/S141/S151	p21-activated kinase 1 (alpha) (serine/threonine-protein kinase PAK 1)	1211	462	-1.38	Q13153			
22	106	NK129	Akt1 (PKBa)	Pan-specific	RAC-alpha serine/threonine-protein kinase	8129	3229	-1.35	P31749			
23	356	NN055	HSF4	Pan-specific	Heat shock transcription factor 4	1272	501	-1.33	P84243			
24	683	PN144	PLCg1	Y783	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase gamma-1	521	206	-1.32	P19174			
25	428	NK217	JNK1	Pan-specific	Jun N-terminus protein-serine kinase (stress-activated protein kinase (SAPK)) 1	995	400	-1.30	P45983			
26	829	PN107	Tau	S422	Microtubule-associated protein tau	2347	996	-1.24	P10836			
27	409	PN118	IRS1	S639	Insulin receptor substrate 1	1455	619	-1.23	P35568			
28	451	NK092-3	Lck	Pan-specific	Lymphocyte-specific protein-tyrosine kinase	985	421	-1.22	P06239			
29	183	NK044	Csk	Pan-specific	C-terminus of Src tyrosine kinase	2111	911	-1.22	P41240			
30	860	NP030	VHR	Pan-specific	Dual specificity protein phosphatase 3	1452	626	-1.21	P51452			
31	62	NN006-1	BCL	Pan-specific	B-cell lymphoma protein 2 alpha	456	195	-1.21	P10415			
32	354	NN054	Hsc70	Pan-specific	Heat shock 70 kDa protein 8	8901	3934	-1.20	P33778			
33	63	NN006	Bcl2	Pan-specific	B-cell lymphoma protein 2 alpha	1830	803	-1.19	P10415			
34	560	NK207	NIK	Pan-specific	NF-kappa beta-inducing kinase	6037	2726	-1.17	Q96558			
35	435	PN154	Jun	S243	Jun proto-oncogene-encoded AP1 transcription factor	567	252	-1.16	P05412			
36	193	PN026	Dab1	Y198	Disabled homolog 1	2018	925	-1.13	Q75553			
37	824	NK175-6	TAK1	Pan-specific	TGF-beta-activated protein-serine kinase 1	10455	4977	-1.10	Q43318			
38	126	NK025-1	CDK1	Pan-specific	Cyclin-dependent protein-serine kinase 1	30090	14525	-1.10	P06493			
39	321	PN196	GATA1	S142	Erythroid transcription factor	606	284	-1.09	P15976			
40	497	NK104	MEK5	Pan-specific	MAPK/ERK protein-serine kinase 5 (MKK5)	4343	2083	-1.08	Q13163			
41	538	NK113-2	MTS1	Pan-specific	Mammalian STE20-like protein-serine kinase 1 (KRS2)	949	451	-1.08	Q13043			
42	7	NK001	Abl	Pan-specific	Abelson proto-oncogene-encoded protein-tyrosine kinase	1663	806	-1.05	P00519			
43	311	PN194	FKHR	S256	Forkhead box protein O1	707	340	-1.05	Q12778			
44	681	PK132	PKR1	T446	Double-stranded RNA-dependent protein-serine kinase	780	382	-1.03	P19825			
45	871	NK186-2	Yes	Pan-specific	Yamaguchi sarcoma proto-oncogene-encoded tyrosine kinase	379	185	-1.03	Q07947			
46	632	NN181-1	PKD3	Pan-specific	Pyruvate dehydrogenase kinase isoform 3	1968	975	-1.03	Q15120			
47	786	PK102	RSK1/2/3	T573	Ribosomal S6 protein-serine kinase 1/2/3	550	276	-1.02	Q15418			
48	430	NK088-2	JNK2	Pan-specific	Jun N-terminus protein-serine kinase (stress-activated protein kinase (SAPK)) 1	8767	4451	-1.01	P45983			
49	166	PN019	Cofilin 1	S3	Cofilin 1	1748	879	-1.01	P23528			
50	92	NK211	CamK1	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase 1 alpha	5566	2848	-1.00	Q14012			
51	868	NK254-1	WNK3	Pan-specific	Serine/threonine-protein kinase WNK3	28779	49415	1.02	Q9BY97			
52	532	NN132	mMOB1	Pan-specific	Preimplantation protein 3	24995	42906	1.02	Q9Y3A3			
53	259	NK231-2	ErbB3	Pan-specific	Tyrosine kinase-type cell surface receptor HER3	38191	66123	1.03	P21860			
54	544	NK116-4	mTOR	Pan-specific	Mammalian target of rapamycin (FRAP)	30321	52429	1.03	P42345			
55	255	NK054-4	ErbB2	Pan-specific	ErbB2 (Neu) receptor-tyrosine kinase	46335	80475	1.03	P04626			
56	466	PN050-1	MARCKS	S152/S156	Myristoylated alanine-rich protein kinase C substrate	639	1068	1.03	P29066			
57	358	NN152-1	Hsp25	Pan-specific	Heat shock 27 kDa protein beta 1 (HspB1)	24508	42718	1.05	P84243			
58	771	PN161	Shc1	Y349	SH2 domain-containing transforming protein 1	319	536	1.06	P29353			
59	763	PK100	RSK1/2	S363/S369	Ribosomal S6 protein-serine kinase 1/2	2402	4119	1.06	Q15418			
60	678	NK203	PKG1b-NT	Pan-specific	gGMP-dependent protein kinase 1, beta isozyme	3440	5927	1.07	P14619			
61	836	PK829	TEC	Y519	Tyrosine-protein kinase Tec	23469	41664	1.09	P42680			
62	525	NK105-6	MKK6	Pan-specific	MAPK/ERK protein-serine kinase 6 (MKK6)	27201	48394	1.10	P52564			
63	706	NK048-6	PRKDC (DNAP)	Pan-specific	DNA-activated protein-serine kinase	33582	60844	1.13	P78527			
64	301	NK061	Fes	Pan-specific	Fes/Fps protein-tyrosine kinase	3149	5586	1.13	P07332			
65	167	PN020	Cofilin 2	S3	Cofilin 2	9922	17790	1.13	Q9Y281			
66	758	NK163-4	Ros	Pan-specific	Orosomucoid 1 receptor-tyrosine kinase	31552	57335	1.14	P08922			
67	855	NK226-2	VGFR1	Pan-specific	Vascular endothelial growth factor receptor 1	36700	66862	1.14	P17948			
68	332	NN049	Gp94	Pan-specific	Glucose regulated protein 94 (endoplasmic)	31855	52628	1.15	P14825			
69	520	NK103-4	MKK4	Pan-specific	MAPK/ERK protein-serine kinase 4 (MKK4)	29498	54033	1.16	P45985			
70	786	PN125	SMC1	S957	Structural maintenance of chromosomes protein 1A	11481	20862	1.16	Q14683			
71	577	PK739	p38a MAPK	T180+pY182	Mitogen-activated protein-serine kinase p38 alpha	5450	9842	1.16	Q16539			
72	442	NK241-2	Kit	Pan-specific	Mast/stem cell growth factor receptor Kit	29913	55164	1.17	P10721			
73	298	PK629	FAK	Y577	Focal adhesion protein-tyrosine kinase	3241	5914	1.19	Q05307			
74	633	NN181-2	PKD3	Pan-specific	Pyruvate dehydrogenase kinase isoform 3	30625	57664	1.22	Q15120			
75	799	NK172-2	Src	Pan-specific	Src proto-oncogene-encoded protein-tyrosine kinase	26954	50923	1.23	P12831			
76	847	NK181-4	TYK2	Pan-specific	Protein-tyrosine kinase 2 (Jak-related)	43928	84730	1.26	P29597			
77	699	NP021	PP5/PPT	Pan-specific	Protein-serine phosphatase 5 - catalytic subunit (PPT)	388	716	1.26	P53041			
78	83	NN174	CA9	Pan-specific	Carbonic anhydrase 9	5178	9838	1.27	Q16790			
79	277	NK056-4	ERK2	Pan-specific	Extracellular regulated protein-serine kinase 2 (p42 MAP kinase)	32595	63025	1.27	P28482			
80	757	NK163-3	Ros	Pan-specific	Orosomucoid 1 receptor-tyrosine kinase	29192	56437	1.28	P08922			
81	458	NK227-2	LKB1	Pan-specific	Serine/threonine-protein kinase 11	35307	68527	1.28	Q15831			
82	368	NN059-3	Hsp60	Pan-specific	Heat shock 60 kDa protein 1 (chaperonin, CPN60)	9800	18844	1.29	P10809			
83	563	PN054	NMDAR2B	Y1472	N-methyl-D-aspartate (NMDA) glutamate receptor 2B subunit	586	1106	1.30	Q13224			
84	302	NK062-3	FGFR1	Pan-specific	Fibroblast growth factor receptor-tyrosine kinase 1	28267	55439	1.31	P11362			
85	718	NP024	PTP1B	Pan-specific	Protein-tyrosine phosphatase 1B	912	1748	1.33	P18031			
86	647	PK073	PKCa	S657	Protein-serine kinase C alpha	7650	15060	1.34	P17252			
87	474	NK099-8	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	40417	80986	1.35	Q02750			
88	835	PK828	TBK1	S172	Serine/threonine-protein kinase TBK1	30087	62174	1.37	Q9UHD2			
89	524	NK105-4	MKK6	Pan-specific	MAPK/ERK protein-serine kinase 6 (MKK6)	23036	46473	1.37	P52564			
90	395	PK154	IKKa	T23	Inhibitor of NF-kappa-B protein-serine kinase alpha (CHUK)	864	1698	1.38	Q15111			
91	331	NN048-2	Gp78	Pan-specific	Glucose regulated protein 78	22110	44787	1.38	P11021			
92	113	NP038-1	Cdc25A	Pan-specific	Cell division cycle 25A phosphatase	26893	54702	1.39	P30304			
93	473	NK099-7	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	33131	68328	1.42	Q02750			
94	39	NK205-4	A-Raf	Pan-specific	A-Raf proto-oncogene serine/threonine-protein kinase	42433	87803	1.42	P10398			
95	421	NK086-2	JAK3	Pan-specific	Janus protein-tyrosine kinase 3	29661	61255	1.42	P52333			
96	265	NK055-2	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	38943	80624	1.42	P27361			
97	521	NK103-5	MKK4	Pan-specific	MAPK/ERK protein-serine kinase 4 (MKK4)	31722	65589	1.42	P45985			
98	273	NK055-NK056-6	ERK1/2	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase) + Extracellular	28097	58082	1.42	P27361			
99	275	PK168-PK169	ERK1/2	Y204+Y187	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase) + Extracellular	3650	7407	1.42	P27361			
100	266	NK055-3	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	40478	84042	1.43	P27361			
101	460	NK227-4	LKB1	Pan-specific	Serine/threonine-protein kinase 11	32026	71557	1.59	Q15831			
102	865	NK252-1	WNK1	Pan-specific	Serine/threonine-protein kinase WNK1	29843	70659	1.72	Q9H4A3			
103	586	NK059-1	p38g MAPK	Pan-specific	Mitogen-activated protein-serine kinase p38 gamma (MAPK12)	6962	16293	1.76	P53778			
104	74	NK156-4	B-Raf	Pan-specific	RafB proto-oncogene-encoded protein-serine kinase	25702	62781	1.79	P15056			
105	463	PK044	MAPKAPK2	T222	Mitogen-activated protein kinase-activated protein kinase 2	4498	11048	1.84	P49137			
106	377	NN063	HspB1	Pan-specific	Hsp70 binding protein 1	4279	11476	2.03	Q95351			
107	669	PK087	PKCI	T555/T563	Protein-serine kinase C lambda/delta/iota	1091	2922	2.06	P41743			
108	187	PN190	Cyclin B1	S147	Cyclin B1	3702	10138	2.08	P14835			
108	456	NK093	LMK1	Pan-specific	LIM domain kinase 1	3537	10571	2.27	P53667			
109	79	PN014	BRCA1	S1497	Bre							

Supplemental Table IV: Altered proteins that are shared by CD151- and CD151+ CD4+ T cells in response to IL-2 stimulation

Serial No.	Antibody Codes	Target Protein Name	Phospho Site (Human)	Full Target Protein Name	CD151-	CD151+ IL-2	Z-ratio	CD151+	CD151+ IL-2	Z-ratio	Uniprot Link	
1	174	PN023	CREB1	S129/S133	cAMP response element binding protein 1	3469	233	-2.81	4048	620	-2.63	P16220
2	435	PN154	Jun	S243	Jun proto-oncogene-encoded AP1 transcription factor	568	51	-2.46	567	252	-1.16	P05412
3	321	PN196	GATA1	S142	Erythroid transcription factor	711	105	-1.96	606	284	-1.09	P15976
4	62	NN006-1	BCL	Pan-specific	B-cell lymphoma protein 2 alpha	975	220	-1.53	456	195	-1.21	P10415
5	242	PN172	eIF4B	S422	Eukaryotic translation initiation factor 4B	1722	404	-1.50	1664	516	-1.66	P23588
6	3	PN114	4E-BP1	T45	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	1865	486	-1.39	771	290	-1.39	Q13541
7	701	PN062	PRAS40	T246	Proline-rich Akt substrate 40 kDa (Akt1S1)	2041	588	-1.29	2057	604	-1.74	Q96B36
8	729	PN064	Rad17	S645	Rad17 homolog	1207	343	-1.29	1010	348	-1.51	Q75943
9	354	NN054	Hsc70	Pan-specific	Heat shock 70 kDa protein 8	8558	2595	-1.28	8901	3934	-1.20	P33778
10	166	PN019	Cofilin 1	S3	Cofilin 1	1603	523	-1.16	1748	879	-1.01	P23528
11	428	NK217	JNK1	Pan-specific	Jun N-terminus protein-serine kinase (stress-activated protein kinase (SAPK)) 1	1062	350	-1.14	995	400	-1.30	P45983
12	250	PN170	Elk1	S389	ETS domain-containing protein Elk-1	1241	417	-1.12	1026	361	-1.49	P19419
13	760	PK157	RSK1	S352	Ribosomal S6 protein-serine kinase 1	2104	739	-1.09	1860	682	-1.44	Q15418
14	606	PK061	PAK1/2/3	S144/S141/S15	p21-activated kinase 1 (alpha) (serine/threonine-protein kinase PAK 1)	1177	429	-1.03	1211	462	-1.38	Q13153
15	458	NK227-2	LKB1	Pan-specific	Serine/threonine-protein kinase 11	22829	46279	1.17	35307	68527	1.28	Q15831
16	763	PK100	RSK1/2	S363/S369	Ribosomal S6 protein-serine kinase 1/2	2153	4525	1.34	2402	4119	1.06	Q15418
17	74	NK156-4	B-Raf	Pan-specific	RafB proto-oncogene-encoded protein-serine kinase	20719	47428	1.39	25702	62781	1.79	P15056
18	757	NK163-3	Ros	Pan-specific	Orosomucoid 1 receptor-tyrosine kinase	26933	62397	1.40	29192	56437	1.28	P08922
19	265	NK055-2	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	37157	88687	1.44	38943	80624	1.42	P27361
20	847	NK181-4	TYK2	Pan-specific	Protein-tyrosine kinase 2 (Jak-related)	27398	68594	1.54	43928	84730	1.26	P29597
21	266	NK055-3	ERK1	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase)	37206	94331	1.55	40478	84042	1.43	P27361
22	456	NK093	LIMK1	Pan-specific	LIM domain kinase 1	4188	10057	1.55	3537	10571	2.27	P53667
23	474	NK099-8	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	28486	71897	1.55	40417	80986	1.35	Q02750
24	758	NK163-4	Ros	Pan-specific	Orosomucoid 1 receptor-tyrosine kinase	26710	71085	1.65	31552	57335	1.14	P08922
25	463	PK044	MAPKAPK2	T222	Mitogen-activated protein kinase-activated protein kinase 2	5182	14309	1.79	4498	11048	1.84	P49137
26	460	NK227-4	LKB1	Pan-specific	Serine/threonine-protein kinase 11	29746	88318	1.84	32026	71557	1.59	Q15831
27	187	PN190	Cyclin B1	S147	Cyclin B1	3137	10644	2.19	3702	10138	2.08	P14635
28	79	PN014	BRCA1	S1497	Breast cancer type 1 susceptibility protein	6499	24876	2.37	6507	20313	2.36	P38398

Supplemental Table V: Proteins that are specifically altered in CD151- CD4+ T cells in response to IL-2 stimulation.

Serial No.	Antibody Codes	Target Protein Name	Phospho Site (Human)	Full Target Protein Name	CD151-	CD151- + IL-2	Z-ratio	Uniprot Link	
1	137	NK026-7	CDK2	Pan-specific	Cyclin-dependent protein-serine kinase 2	12506	2560	-1.69	P24941
2	154	PK162	Chk1	S280	Checkpoint protein-serine kinase 1	3220	875	-1.36	Q14757
3	728	PN063	Rac1/cdc42	S71	Ras-related C3 botulinum toxin substrate 1	627	185	-1.24	P63000
4	813	NN105	STAT5A	Pan-specific	Signal transducer and activator of transcription 5A	21244	7007	-1.21	P42229
5	123	NN023	Cdc34	Pan-specific	Cell division cycle 34 (ubiquitin-conjugating ligase)	3224	1037	-1.19	P49427
6	817	NN108	STI1	Pan-specific	Stress induced phosphoprotein 1 (Hsc70/Hsp90 organizing protein (Hop))	1527	481	-1.19	P31948
7	695	NP018	PP2Cd	Pan-specific	Protein-serine phosphatase 2C - catalytic subunit - delta isoform	1136	364	-1.17	Q15297
8	513	PK055-1	Met	Y1230/Y1234/V	Hepatocyte growth factor (HGF) receptor-tyrosine kinase	1384	451	-1.15	P08581
9	854	PK133	VEGFR2	Y1214	Vascular endothelial growth factor receptor-tyrosine kinase 2 (Flk1)	1321	436	-1.14	P35968
10	47	PN115	ATF2	S94/S112	Activating transcription factor 2 (CRE-BP1)	2146	727	-1.13	P15336
11	725	PK097-3	PYK2	Y579	Protein-tyrosine kinase 2	1538	516	-1.13	Q14289
12	58	PN009	B23 (NPM)	T234/237	B23 (nucleophosmin, numatrin, nucleolar protein NO38)	1682	586	-1.09	P06748
13	610	NK200-2	PAKγ	Pan-specific	p21-activated kinase 2 (gamma) (serine/threonine-protein kinase PAK 2)	11133	4059	-1.09	Q13177
14	132	PK008-1	CDK1/CDC2	T161	Cyclin-dependent protein-serine kinase 1/2	1167	424	-1.04	P06493
15	455	PK041	Lck	Y505	Lymphocyte-specific protein-tyrosine kinase	2058	786	-1.00	P06239
16	652	NK135	PKCδ	Pan-specific	Protein-serine kinase C delta	6982	12572	1.01	Q05655
17	650	PK075-2	PKCβ1/2	T500	Protein-serine kinase C beta 1/2	913	1597	1.04	P05771
18	361	PN041	Hsp27	S78	Heat shock 27 kDa protein beta 1 (HspB1)	13085	24743	1.07	P04792
19	175	PN024	CREB1	S133	cAMP response element binding protein 1	28402	55552	1.09	P16220
20	765	PK101-2	RSK1/2	S380/S386	Ribosomal S6 protein-serine kinase 1/2	1831	3410	1.13	Q15418
21	764	PK100-2	RSK1/2	S363/S369	Ribosomal S6 protein-serine kinase 1/2	1208	2262	1.15	Q15418
22	93	NK022	CaMKK	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase kinase	4886	9956	1.24	Q8N5S9
23	203	NP006-2	DUSP1 (MKP1)	Pan-specific	MAP kinase phosphatase 1 (CL100, VH1)	30957	69448	1.34	P28562
24	89	NK019-2	CAMK2δ	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase 2 delta	2324	5252	1.46	Q13557
25	364	NN057-3	Hsp40	Pan-specific	DnaJ homolog, subfamily B member 1	18087	42856	1.46	P25685
26	852	NN176	VEGF-C	Pan-specific	Vascular endothelial growth factor C	5256	12440	1.51	P49767
27	84	PN015	Caldesmon	S789	Caldesmon	3777	9038	1.55	Q05682
28	647	PK073	PKCα	S657	Protein-serine kinase C alpha	3917	9721	1.61	P17252
29	653	PK079-1	PKCδ	S645	Protein-serine kinase C delta	2709	6680	1.62	Q05655

Supplemental Table VI: Proteins that are specifically altered in CD151+ CD4+ T cells in response to IL-2 stimulation

Serial No.	Antibody Codes	Target Protein Name	Phospho Site (Human)	Full Target Protein Name	CD151+	CD151+ +IL-2	Z-ratio	Uniprot Link	
1	312	PN195	FKHR	S319	Forkhead box protein O1	531	85	-2.54	Q12778
2	245	PN030-2	eIF4E	S209	Eukaryotic translation initiation factor 4 (mRNA cap binding protein)	1531	273	-2.41	P06730
3	709	PN104	Progesterone R	S294	Progesterone receptor	623	122	-2.27	P06401
4	137	NK026-7	CDK2	Pan-specific	Cyclin-dependent protein-serine kinase 2	13424	3482	-1.93	P24941
5	534	NK111	Mnk2	Pan-specific	MAP kinase-interacting protein-serine kinase 2 (calmodulin-activated)	3973	1139	-1.78	Q9H8H9
6	46	PK143	ASK1	S966	Apoptosis signal regulating protein-serine kinase 1	722	206	-1.76	Q59GL6
7	248	NN168	Elk1	Pan-specific	ETS domain-containing protein Elk-1	940	269	-1.76	P19419
8	97	NN016	Caspase 6	Pan-specific	Caspase 6 (apoptotic protease Mch2)	996	301	-1.69	P55212
9	439	PN155	Jun	Y170	Jun proto-oncogene-encoded AP1 transcription factor	1458	455	-1.65	P05412
10	143	NK028-5	CDK5	Pan-specific	Cyclin-dependent protein-serine kinase 5	14047	4821	-1.55	Q00535
11	147	NK030-2	CDK7	Pan-specific	Cyclin-dependent protein-serine kinase 7	11993	4557	-1.41	P50613
12	548	PN182	MyoD	S200	Myoblast determination protein 1	1038	394	-1.38	P15172
13	16	NK129	Akt1 (PKBa)	Pan-specific	RAC-alpha serine/threonine-protein kinase	8129	3229	-1.35	P31749
14	356	NN055	HSF4	Pan-specific	Heat shock transcription factor 4	1272	501	-1.33	P84243
15	683	PN144	PLCg1	Y783	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase gamma-1	521	206	-1.32	P19174
16	829	PN107	Tau	S422	Microtubule-associated protein tau	2347	996	-1.24	P10636
17	409	PN118	IRS1	S639	Insulin receptor substrate 1	1455	619	-1.23	P35568
18	451	NK092-3	Lck	Pan-specific	Lymphocyte-specific protein-tyrosine kinase	985	421	-1.22	P06239
19	183	NK044	Csk	Pan-specific	C-terminus of Src tyrosine kinase	2111	911	-1.22	P41240
20	860	NP030	VHR	Pan-specific	Dual specificity protein phosphatase 3	1452	626	-1.21	P51452
21	63	NN006	Bcl2	Pan-specific	B-cell lymphoma protein 2 alpha	1830	803	-1.19	P10415
22	560	NK207	NIK	Pan-specific	NF-kappa beta-inducing kinase	6037	2726	-1.17	Q99558
23	193	PN026	Dab1	Y198	Disabled homolog 1	2018	925	-1.13	Q75853
24	824	NK175-5	TAK1	Pan-specific	TGF-beta-activated protein-serine kinase 1	10455	4977	-1.10	Q43318
25	126	NK025-1	CDK1	Pan-specific	Cyclin-dependent protein-serine kinase 1	30090	14525	-1.10	P06493
26	497	NK104	MEK5	Pan-specific	MAPK/ERK protein-serine kinase 5 (MKK5)	4343	2083	-1.08	Q13163
27	538	NK113-2	MTS1	Pan-specific	Mammalian STE20-like protein-serine kinase 1 (KRS2)	949	451	-1.08	Q13043
28	7	NK001	Abl	Pan-specific	Abelson proto-oncogene-encoded protein-tyrosine kinase	1663	806	-1.05	P00519
29	311	PN194	FKHR	S256	Forkhead box protein O1	707	340	-1.05	Q12778
30	681	PK132	PKR1	T446	Double-stranded RNA-dependent protein-serine kinase	780	382	-1.03	P19525
31	871	NK186-2	Yes	Pan-specific	Yamaguchi sarcoma proto-oncogene-encoded tyrosine kinase	379	185	-1.03	P07947
32	632	NN181-1	PKD3	Pan-specific	Pyruvate dehydrogenase kinase isoform 3	1968	975	-1.03	Q15120
33	766	PK102	RSK1/2/3	T573	Ribosomal S6 protein-serine kinase 1/2/3	560	276	-1.02	Q15418
34	430	NK088-2	JNK2	Pan-specific	Jun N-terminus protein-serine kinase (stress-activated protein kinase (SAPK)) 1	8767	4451	-1.01	P45983
35	92	NK211	CamK1	Pan-specific	Calcium/calmodulin-dependent protein-serine kinase 1 alpha	5566	2848	-1.00	Q14012
36	868	NK254-1	WNK3	Pan-specific	Serine/threonine-protein kinase WNK3	28779	49415	1.02	Q9BY77
37	532	NN132	mMOB1	Pan-specific	Preimplantation protein 3	24995	42906	1.02	Q9Y3A3
38	259	NK231-2	ErbB3	Pan-specific	Tyrosine kinase-type cell surface receptor HER3	38191	66123	1.03	P21860
39	544	NK116-4	mTOR	Pan-specific	Mammalian target of rapamycin (FRAP)	30321	52429	1.03	P42345
40	255	NK054-4	ErbB2	Pan-specific	ErbB2 (Neu) receptor-tyrosine kinase	46335	80475	1.03	P04626
41	466	PN050-1	MARCKS	S152/S156	Myristoylated alanine-rich protein kinase C substrate	639	1068	1.03	P29966
42	358	NN152-1	Hsp25	Pan-specific	Heat shock 27 kDa protein beta 1 (HspB1)	24508	42718	1.05	P84243
43	771	PN161	Shc1	Y349	SH2 domain-containing transforming protein 1	319	536	1.06	P29353
44	678	NK203	PKG1b-NT	Pan-specific	cGMP-dependent protein kinase 1, beta isozyme	3440	5927	1.07	P14619
45	836	PK829	TEC	Y519	Tyrosine-protein kinase Tec	23469	41664	1.09	P42680
46	525	NK105-5	MKK6	Pan-specific	MAPK/ERK protein-serine kinase 6 (MKK6)	27201	48394	1.10	P52564
47	706	NK048-6	PRKDC (DNAP	Pan-specific	DNA-activated protein-serine kinase	33582	60844	1.13	P78527
48	301	NK061	Fes	Pan-specific	Fes/Fps protein-tyrosine kinase	3149	5586	1.13	P07332
49	167	PN020	Cofilin 2	S3	Cofilin 2	9922	17790	1.13	Q9Y281
50	855	NK226-2	VGFR1	Pan-specific	Vascular endothelial growth factor receptor 1	36700	68662	1.14	P17948
51	332	NN049	Gp94	Pan-specific	Glucose regulated protein 94 (endoplasmic)	31855	58268	1.15	P14625
52	520	NK103-4	MKK4	Pan-specific	MAPK/ERK protein-serine kinase 4 (MKK4)	29498	54033	1.16	P45985
53	786	PN125	SMC1	S957	Structural maintenance of chromosomes protein 1A	11481	20862	1.16	Q14683
54	577	PK739	p38a MAPK	T180+pY182	Mitogen-activated protein-serine kinase p38 alpha	5450	9842	1.16	Q16539
55	442	NK241-2	Kit	Pan-specific	Mast/stem cell growth factor receptor Kit	29913	55164	1.17	P10721
56	298	PK629	FAK	Y577	Focal adhesion protein-tyrosine kinase	3241	5914	1.19	Q05397
57	633	NN181-2	PKD3	Pan-specific	Pyruvate dehydrogenase kinase isoform 3	30625	57664	1.22	Q15120
58	799	NK172-2	Src	Pan-specific	Src proto-oncogene-encoded protein-tyrosine kinase	26954	50923	1.23	P12931
59	699	NN021	PP5/PPT	Pan-specific	Protein-serine phosphatase 5 - catalytic subunit (PPT)	388	716	1.26	P53041
60	83	NN174	CA9	Pan-specific	Carbonic anhydrase 9	5178	9838	1.27	Q16790
61	277	NK056-4	ERK2	Pan-specific	Extracellular regulated protein-serine kinase 2 (p42 MAP kinase)	32595	63025	1.27	P28482
62	368	NN059-3	Hsp60	Pan-specific	Heat shock 60 kDa protein 1 (chaperonin, CPN60)	9800	18844	1.29	P10809
63	563	PN054	NMDAR2B	Y1472	N-methyl-D-aspartate (NMDA) glutamate receptor 2B subunit	586	1106	1.30	Q13224
64	302	NK062-3	FGFR1	Pan-specific	Fibroblast growth factor receptor-tyrosine kinase 1	28267	55439	1.31	P11362
65	718	NP024	PTP1B	Pan-specific	Protein-tyrosine phosphatase 1B	912	1748	1.33	P18031
66	647	PK073	PKCa	S657	Protein-serine kinase C alpha	7650	15060	1.34	P17252
67	835	PK828	TBK1	S172	Serine/threonine-protein kinase TBK1	30807	62174	1.37	Q9UHD2
68	524	NK105-4	MKK6	Pan-specific	MAPK/ERK protein-serine kinase 6 (MKK6)	23036	46473	1.37	P52564
69	395	PK154	IKKa	T23	Inhibitor of NF-kappa-B protein-serine kinase alpha (CHUK)	864	1698	1.38	O15111
70	331	NN048-2	Gp78	Pan-specific	Glucose regulated protein 78	22110	44787	1.38	P11021
71	113	NP038-1	Cdc25A	Pan-specific	Cell division cycle 25A phosphatase	26893	54702	1.39	P30304
72	473	NK099-7	MEK1	Pan-specific	MAPK/ERK protein-serine kinase 1 (MKK1)	33131	68328	1.42	Q02750
73	39	NK205-4	A-Raf	Pan-specific	A-Raf proto-oncogene serine/threonine-protein kinase	42433	87803	1.42	P10398
74	521	NK103-5	MKK4	Pan-specific	MAPK/ERK protein-serine kinase 4 (MKK4)	31722	65589	1.42	P45985
75	273	NK055-NK056-2	ERK1/2	Pan-specific	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase) + Extracellular	28097	58082	1.42	P27361
76	275	PK168-PK169	ERK1/2	Y204+Y187	Extracellular regulated protein-serine kinase 1 (p44 MAP kinase) + Extracellular	3650	7407	1.42	P27361
77	865	NK252-1	WNK1	Pan-specific	Serine/threonine-protein kinase WNK1	29843	70659	1.72	Q9H4A3
78	586	NK059-1	p38g MAPK	Pan-specific	Mitogen-activated protein-serine kinase p38 gamma (MAPK12)	6862	16293	1.76	P53778
79	377	NN063	HspBP1	Pan-specific	Hsp70 binding protein 1	4279	11476	2.03	O95351
80	669	PK087	PKCi	T555/T563	Protein-serine kinase C lambda/iota	1091	2922	2.06	P41743
81	802	PK107	Src	Y418	Src proto-oncogene-encoded protein-tyrosine kinase	754	2711	2.71	P12931

Supplemental Table VII: Proteins that are altered in Jurkat T cells by CD151 overexpression.

Target Protein Name	Phospho Site (Human)	Full Target Protein Name	Jurkat	J-CD151	Z-ratio	Uniprot Link	Phosphorylation	MAPK cascade	Cell death	Cell proliferation
1 NFkB p65	S529	NF-kappa-B p65 nuclear transcription factor	879	1791	1.00	Q04206				
2 Yes	Pan-specific	Yamaguchi sarcoma proto-oncogene-encoded tyrosine kinase	813	1698	1.04	P07947				
3 Hsp60	Pan-specific	Heat shock 60 kDa protein 1 (chaperonin, CPN60)	1896	4145	1.05	P10809				
4 Myc	S373	Myc proto-oncogene protein	1118	2419	1.07	P01106				
5 Cofilin	Pan-specific	Cofilin 1	1103	2385	1.07	P23528				
6 eIF2a	Pan-specific	Eukaryotic translation initiation factor 2 alpha	1073	2332	1.08	P05198				
7 PTP1C	Pan-specific	Protein-tyrosine phosphatase 1C (SHP1, SHPTP1)	1347	2982	1.09	P29350				
8 GluR1	S849	Glutamate receptor 1	2235	5067	1.09	P42261				
9 PP2Cd	Pan-specific	Protein-serine phosphatase 2C - catalytic subunit - delta isoform	987	2166	1.09	Q15297				
10 PTEN	S380/T382/T383	Phosphatidylinositol-3-OH kinase class I gamma 3 phosphatase and protein phosphatase alpha	1195	2674	1.11	P60484				
11 Histone H2A.X	S139	Histone H2A variant X	622	1356	1.11	P16104				
12 CDK1/2	Y15	Cyclin-dependent protein-serine kinase 1/2	711	1568	1.12	P06493				
13 c-Cbl	Y700	Signal transduction protein CBL	853	1897	1.12	P22681				
14 Gab1	Y627	GRB2-associated binder 1	648	1453	1.15	Q13480				
15 MKP2	Pan-specific	MAP kinase phosphatase 2 (VH2)	855	1943	1.15	Q13115				
16 PSD-95	Pan-specific	Disks large homolog 4	836	1988	1.22	P78352				
17 eIF4E	S209	Eukaryotic translation initiation factor 4 (mRNA cap binding protein)	1116	2696	1.22	P06730				
18 PKR1	T446	Double-stranded RNA-dependent protein-serine kinase	1161	2811	1.22	P19525				
19 PLCg2	Y753	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase gamma-2	1181	2875	1.23	P16885				
20 CDK1/CDC2	T161	Cyclin-dependent protein-serine kinase 1/2	547	1303	1.24	P06493				
21 Akt1 (PKBa)	S473	RAC-alpha serine/threonine-protein kinase	2076	5250	1.25	P31749				
22 GNB2L1	Pan-specific	Guanine nucleotide-binding protein beta (receptor for activated C kinase 1 (RACK1))	1923	4880	1.26	P63244				
23 RIP2/RICK	Pan-specific	Receptor-interacting serine/threonine-protein kinase 2 (RIPK2)	1123	2803	1.26	Q43353				
24 HDAC4/5/9	S246/259/220	Histone deacetylase 4	980	2616	1.36	P56524				
25 MyoD	S200	Myoblast determination protein 1	665	1805	1.41	P15172				
26 LAR	Pan-specific	LCA antigen-related (LAR) receptor tyrosine phosphatase	624	1695	1.42	P10586				
27 Caspase 7	Pan-specific	Caspase 7 (ICE-like apoptotic protease 3 (ICE-LAP3), Mch3)	1797	5136	1.42	P55210				
28 PKA R2a (PKR)	S98	cAMP-dependent protein-serine kinase regulatory type 2 subunit alpha	1183	3419	1.46	P13861				
29 MYPT1	T696	Myosin phosphatase target 1	1259	3694	1.48	Q14974				
30 IRS1	S312	Insulin receptor substrate 1	963	2930	1.55	P35568				
31 Tau	T205	Microtubule-associated protein tau	909	2887	1.61	P10636				
32 p70 S6K	S424	Ribosomal protein S6 kinase beta-1	974	3240	1.67	P23443				
33 Shc1	Y349	SH2 domain-containing transforming protein 1	556	1818	1.68	P29353				
34 MEK6	Pan-specific	MAPK/ERK protein-serine kinase 6 (MKK6)	311	1076	1.79	P52564				
35 FKHR	S319	Forkhead box protein O1	406	1430	1.80	Q12778				
36 IKKa	T23	Inhibitor of NF-kappa-B protein-serine kinase alpha (CHUK)	898	3273	1.80	Q15111				
37 Rb	S780	Retinoblastoma-associated protein 1	586	2124	1.82	P06400				
38 S6	S235	40S ribosomal protein S6	1639	6498	1.88	P62753				
39 4E-BP1	Pan-specific	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	1150	4501	1.88	Q13541				
40 IRS1	S639	Insulin receptor substrate 1	620	2365	1.88	P35568				
41 4E-BP1	T45	Eukaryotic translation initiation factor 4E binding protein 1 (PHAS1)	949	3731	1.90	Q13541				
42 STAT2	Y689	Signal transducer and activator of transcription 2	504	1997	1.95	P52630				
43 Catenin a	S641	Catenin (cadherin-associated protein) alpha	663	2691	1.97	P35221				
44 PLCg1	Y783	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase gamma-1	747	3132	2.00	P19174				
45 JAK1	Y1022	Janus protein-tyrosine kinase 1	582	2565	2.09	P23458				
46 EGFR	Y1197	Epidermal growth factor receptor-tyrosine kinase	712	3642	2.28	P00533				
47 BCL	Pan-specific	B-cell lymphoma protein 2 alpha	195	1384	2.80	P10415				