

Supplementary Figure 1. PAG protein expression in the top 10 highest expressing tissues¹⁴.



Supplementary Figure 2. Jurkat cells expressing PAG-GFP were stimulated with anti-CD3 alone or with PDL1 or PDL2. PAG-GFP was enriched by immunoprecipitation of the lysates and phosphotyrosine was detected by immunoblot. Representative blot of three independent experiments is shown.



Supplementary Figure 3. a. Jurkat cells expressing either a non-targeting shRNA (shControl) or a PAG targeting shRNA (shPAG) were lysed and run on a western blot. Immunoblot shows PAG and actin protein levels. Representative blot is shown. **b.** Jurkat cells expressing sh PAG were transfected with wild type full length PAG or phosphodeficient versions and GFP expression was quantified by flow cytometry.



Supplementary Figure 4. a. ELISA of secreted IL-2. Jurkat cells expressing sh Control or sh PAG were stimulated for 24 hours before supernatants were collected. Bars represent mean ± SEM of three independent experiments. **b** - **e**. Representative western blots of primary T cells (b, c) and Jurkat cells (d, e) expressing si/sh control or si/sh PAG and rescue transfections with various versions of PAG into shPAG expressing Jurkat cells as indicated. **d.** Table summarizing the contributions of phosphotyrosines 181, 317, and 417 to the assessed T cell functions and PD-1 signaling.



Supplementary Figure 5. a. and b. ELISA of secreted IL-2 (a) and IFN γ (b) in the supernatants of primary human CD3⁺ T cells collected 48 hours following stimulation by magnetic beads. T cells either expressed a non-targeting siRNA (control) or PAG targeting siRNA pool (siPAG). c and d. Phosphorylated ERK (c) and phosphorylated SRC (d) were detected by western blot of human CD3⁺ T cell lysates 5 minutes after stimulation by magnetic beads. Fold change is calculated relative to anti-CD3 stimulation (c) or unstimulated (d). *p<0.05; **p<0.01; ***p<0.001; ****p<0.0001; ns not significant.



а



o no contribution, + some contribution, ++ necessary role

Supplementary Figure 6. a. ELISA of secreted IL-2 in the supernatants of Jurkat cells collected 24 hours following stimulation by magnetic beads. Jurkat T cells either expressed a non-targeting shRNA (control) or PAG targeting shRNA (shPAG). For rescue transfections, shPAG Jurkats were transiently transfected with full length, wild type PAG (PAG FL) or with phosphodeficient mutants (Y181A, Y317A, Y417A). b. Adhesion assay of Jurkat cells to fibronectin following stimulation for 15 minutes. The number of adherent cells remaining, expressed as a percentage of the total number of labeled cells, was determined with a fluorescent plate reader. PAG knockdown and rescue transfections as in (A). c. Percentage of Jurkat cells expressing CD69 on the surface following 24 hour stimulation, measured by flow cytometry. PAG knockdown and rescue transfections as in (A). d and e. Phosphorylated ERK (D) and phosphorylated SRC (E) were detected by western blot of Jurkat lysates 5 minutes after stimulation by magnetic beads. PAG knockdown and rescue transfections as in (A). % inhibition is calculated by 100 - CD3+PDL2 + CD3 * 100. Bars represent the mean ± SEM of three independent experiments. f. Table summarizing the contribution of each $phosphotyrosine \ position \ to \ individual \ T \ cell \ functions \ assayed. \ *p<0.05; \ **p<0.01; \ ****p<0.001; \ ****p<0.0001; \ ns \ not \ significant.$



Supplementary Figure 7. Human naïve (CD8⁺CCR7⁺CD62L⁺) and effector (CD8⁺CCR7⁻CD62L⁻) T cells were stained with intracellular anti-PAG antibody and analyzed by flow cytometry. MFI - median fluorescent intensity.

Supplementary Table 1. IL-2 ELISA

Primary human					0.50							
I Cells	L	Unstimula	ted		aCD3	_	aCD3+PDL2					
Control	20	25	0	661	640	655	201	230	227			
si PAG	20	30	32	553	578	610	510	619	569			
Jurkat cells		Unstimula	ted		aCD3		а	CD3+PDL	2			
Control	20	5	23	805	946	902	289	410	422			
sh PAG	35	22	32	871	953	944	731	748	741			
PAG FL	25	23	23	754	835	810	411	457	482			
PAG Y181A	19	27	15	750	848	821	691	710	688			
PAG Y317A	12	14	27	737.8349	790	780	688	756	702			
PAG Y417A	33	18	29	777	810	838	440	435	398			

Supplementary Table 2. IFNg ELISA

	ι	Jnstimulated			aCD3			aCD3+PDL2	
Control	27	71	46	1298	1301	1514	750	1050	920
si PAG	154	30	36	1650	1453	1404	1400	1000	1500

Supplementary Table 3. Percent inhibition of CD69 expression

	U	nstimulate	d		aCD3		aCD3+PDL2					
Control	3	3	0	51	59	54	30	33	32			
sh PAG	3	4	5	54	62	67	66	69	71			
PAG FL	7	6	6	49	57	53	32	30				
PAG Y181A	8	6	2	51	45	50	56	45	47			
PAG Y317A	7	6	11	52	56	54	47	49	55			
PAG Y417A	6	7	10	27	35	32	31	39	38			

Supplementary	Table 4.	Percent	inhibition	of adhesion
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	U	nstimulate	d		aCD3		aCD3+PDL2					
Control	10	14	11	35	37	34	17	18	18			
sh PAG	14	18	12	28	32	33	32	37	25			
PAG FL	8	10	11	30	38	34	15	17	20			
PAG Y181A	9	13	7	32	27	31	22	17	21			
PAG Y317A	12	16	14	31	36	34	30	33	27			
PAG Y417A	8	13	17	37	29	33	18	19	17			

Supplementary Table 5. MC38 Tumor Measurements

Days	WT												WT + Anti-PD-1										
1	25.38	55.14	18.37	38.53	35								15.1	30.77	14.98	27.7	22						
2	71	66.17	55.57	131.92	89								29	34.82	30.77	30.77	26						
3	117	122.45	168.31	106.96	128								75	94.38	21.64	44.13	58						
4	130	142.41	217	173.97	144	0	137.795		0				77	75	73.32	63.9	78						
5	242.61	172	321	186.44	215	0	206.822		85.82				83.45	96	121.6	107.52	96						
6	385	209	283.34	166.74	230	0	263.709		192.584				46	140.4	191.94	99.72	126						
7	406	258.44	253.51	319.37	282	0	263.178		171.921	13	6	0.5	74	128	232.81	157.48	119.29	40	0	28.9			
8	394	330	327.71	288	316	308.386	285.0369	71.345	167.225				136.71	205	173	191.87	149.5						
9	406	353	396.8	402	460	498.026	320.183	62.086	239.61				187.8	198	244.46	214.97	222.11						
10	679.59	356.72	644.64	416	559	412.139	315.268	55.729	309.468	25.6	34.4	6	308.74	177	389.81	324.68	203.84	54.7	18	32			
11	706.97	360.72	728	388	576	439.206	442.512	67.7	320.023				428.69	150.92	318.42	413.27	138.53						
12	710.22	547.82	801	622	616	474.235	493.067	82.79	446.59	27.5	42	6.4	421.34	279.34	606.5	712.81	242.62	108	20.5	66.3			
13	942	642.55	904	661.74	787	1159.27	494.31	122.14	551.609				713	343.16	638.19	779	382.67						
14	1023	847	1066.42	953.24	972	948.579	552.337	140.041	489.995	49.5	63.8	13.5	801.22	331.02	859.95	1202	561.6	123	23	176.4			
15	1180.05	1075	1300.62	1134.02	1001								798	381.06	741.41	1380.87	383.21						
16	1249	1240.75	1319	1655	1361	1398.769	851.633	239.054	489.995				617	568.22	1178.04	1202.81	503.79						
17	1486.94	1476	1531	2449.41	1396	1557.991	1085.625	179.7444	1128.868	494.6	198.5	35.3	811	565.71	871.45	1221	498.39	151.9	65.8	181.5			
							1134.799																
18	1510	1599	2205	1891	1499	1995.209	<u> </u>	1432.954	1287				887	565.71	888	1229	890.56						
19	2228.79	1602	2924.93	2153.34	2226	2857.511	1464.737		1597.866	2099.2	530.6	505	1107	670.03	621	839	796.89	372.6	368.6	380.9			
20	2721	1819	2782.54	3112	2609								1238.45	832.53	770	910	761.3						
21	2811	2115.94	3321.19	3339	2896					2615.5	1503.6	1687.5	1309	1115.38	894	1103	1097.46	625	539.1	585			
22	2985	2529	3544	3620	3160								1877	1510	1871	1671	1529						
23	3296	2575	3717	3812	3319					2924.7	1813	2176	1977	1560	1799	1790	1617	925.8	864	828.2			
24														1819		1937	1870.21						

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Days	PAG KO											PAG KO + Anti-PD-1										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1	22.36	47.39	17.93	28.3	28								15	35.89	28	34.37	18.72					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	2	132.05	76.15	11.4	61.18	70								21	53.35	18.65	61.18	64.13					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	3	138.03	81.71	6.97	78.45	75								27	54.64	18	40.77	75.94					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	4	198.6	114.54	222	121.4	91	0	0	35.8	0				29	63.79	48.19	74.28	79.98					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	5	242.05	309.24	313	90.13	93	39.076	104.956	39.9	28.925				42	118.15	39.72	50.62	125.23					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	6	231.08	268	621.1	171.37	179	29.575	204.462	79.681	119.5168				43	125	42.61	136.44	196.61					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	7	331.14	316.16	487.28	201.29	263	78.363	433.102	100.786		0	48.6	0	39	135.51	58.59	158.18	154.52	0	0	6		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	8	227.23	391	653.02	229.13	351	129.23	179.61	66.21	198.0825 6				45	87.72	80.11	121.9	182.68					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	9	256.2	342.81	540.04	160.63	389	61.575	290.368	120.956	187.4329 6				52	57.7	78.29	55.59	198.16					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	10	157.77	369.5	712.36	314.68	387	117.807	286.026	118.521		22.1	90	62.5	49	87.82	93.08	137.92	328.6	0.6	6.6	7.5		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	11	418.8	462	817	157.09	532	136.628	286.807	103.151					53	157.39	162.38	161.07	227.27					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	12	325.62	668.03	472	424.15	471	130.024	307.683	136.448	224.2468 8	24	94.6	83.1	47	111.65	222.86	62.92	108	1	7.3	30.4		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	13	473.05	474.27	397	246.63	399	135.266	362.054	138.476	222.1326 016				41	184.86	278.83	122.45	115					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	14	435.73	1069.22	595	281.5	595	166.972	451.149	169.296	344.8345 285	94.6	130.2	87.5	29	97.5	264.49	96.21	120	6.6	18.9	32		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	15	519.47	920.88	487	292.08	554				415.3593 6				47	246.63	282.53	119.86	172					
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	16	602.49	491	490	245.8	485	166.972	451.149	169.296	499.5099 2				52	212.84	472	193.98	209					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	17	447.79	461	521	595.11	601	180.031	732.321	245.7	467.1180 8	189.2	224.3	118.8	61	249.77	393	240.48	225	166.6	40	56.4		
111 951.68 509 851 730.34 648 186.238 881.778 311.11.37 (17.10)8 474 355.2 500 64 259 237.2 137.7 245 20 1200 668 1013 898.6 801 277.3 180.278 6 981.238 981.238 981.238 233.955 64 981.238 981.238 233.955 64 981.238 233.955 64 105.2 123.8 108.5 81 218 308 252 217.0 327.2 137.7 245 21 1289 8993 1106 898.9 989 288.343 233.955 64 105.4 129.8 108.5 81 218 308 252 212 352 216.6 320 22 1444 921 1307 129.31 350.664 101.2 109.5 81 218 308 230 207 20 20 201 24 496.9 267.2 445.5 445.3 23 1619 1071 1510 1407 1278 374.54 358.337 128.91 140.8 108.5 362 280 172 496.9 267.2 445.5 445.5 </td <th>18</th> <td>447.79</td> <td>497</td> <td>559</td> <td>595.11</td> <td>537</td> <td>223.911</td> <td>676.829</td> <td>205.705</td> <td>511.0716</td> <td></td> <td></td> <td></td> <td>60</td> <td>261</td> <td>298</td> <td>241</td> <td>227</td> <td></td> <td></td> <td></td> <td></td> <td></td>	18	447.79	497	559	595.11	537	223.911	676.829	205.705	511.0716				60	261	298	241	227					
20 1200 666 1013 898.6 801 217.51 907.273 115.481 1054.2 1239.8 106 264 1 1 105.427 105.427 105.427 105.427 105.427 105.427 105.42 1239.8 108.5 81 218 308 252 211 352 215.6 320 105.42 105.42 1239.8 109.65 81 218 308 252 212 352 215.6 320 105.42 1239.8 109.65 81 218 308 252 212 352 215.6 320 106 106.42 101 238 330 207 207 20 100 238 330 207 207 20 0 0 101 238 330 207 207 207 207 208 108 101 238 330 207 207 208 108 101 238 330 207 207 208 1	19	951.68	509	851	730.34	648	186.235	881.776	311.413	717.1008	474	355.2	500	64	251	359	246	229	237.2	137.7	245		
21 1288 893 1106 896.9 989 288.343 233.955 64 1054.2 129.8 101 238 330 207 207 52 215.6 320 320 22 1448 921 1307 1239.11 1197 339.381 350.684 101 238 330 207 207 20 20 23 1619 1071 1510 1407 1278 374.545 356.8337 1259.1 1540.8 1183 96 340 362 280 127 496.9 267.2 445.5 24 249.9 240 1689 1182 196 340 362 280 127 496.9 267.2 445.5 24 24 128 1183 96 340 362 280 127.4 496.9 267.2 445.5 24 24 280 280 280 280 280 280 280 280 280 280 280 280 <th>20</th> <td>1200</td> <td>666</td> <td>1013</td> <td>898.6</td> <td>801</td> <td>217.512</td> <td>907.473</td> <td>180.279</td> <td>981.2883 6</td> <td></td> <td></td> <td></td> <td>98</td> <td>257</td> <td>370</td> <td>336</td> <td>264</td> <td></td> <td></td> <td></td> <td></td> <td></td>	20	1200	666	1013	898.6	801	217.512	907.473	180.279	981.2883 6				98	257	370	336	264					
22 1448 921 1307 1239.11 11971 339.381 350.664 1011 238 330 207 207 9 23 1619 1071 1510 11407 1278 374.545 358.337 1259.1 1540.8 1183 96 340 362 280 172 496.3 267.2 445.5 101 24 1698 1612 1503 107 458 280 107 458 280 107 108	21	1289	893	1106	898.9	989	288.343		233.955	1115.481 64	1054.2	1239.8	1098.5	81	218	308	252	212	352	215.6	320		
23 1619 1071 1510 1407 1278 374.543 358.337 1259.11 1540.8 1183 96 340 362 280 172 496.9 267.2 445.5 445.5 24 1699 1612 1503 1 1103 96 340 362 280 1 1 107 458 1	22	1448	921	1307	1239.11	1197	339.381		350.664					101	239	330	207	207					
24 1698 1612 1503 107 458 280	23	1619	1071	1510	1407	1278	374.545		358.337		1259.1	1540.8	1183	96	340	362	280	172	496.9	267.2	445.5		
	24	1698		1612	1503									107	458	280							

Supplementary Table 6. B16F10 Tumor Measurements

Davs				N	T									WT + /	Inti-PD-	.1			
1	0				<u> </u>		1	-			0	-			1	<u> </u>			1
2	0										0				-				
3	0										0								
4	0										0	_			-				
5	0							_			0				-				
, i i i i i i i i i i i i i i i i i i i	0						-	_			0								
7	0						-	_			0				-				
6	62.6	70	109	76	45		-	_			40	62	E.		-				
0	02.3	100	100	106	43		-				42	100	0						
10	110	133	110	120	167						150	100	129						
10	125	100	143	270	226		-	_			202	165	176		-				
10	160 4376	120	143	270	230		-	_		220.0	203	200	240						
12	100.4070	100	207	400	300.334	61	2	40.4	40.0	239.0	229	200	201	67		50	0		
13	201	170	207	400	420	01		40.4	40.0		320	302	391	07.	-	50	0		
14	304	301	360	5/3	298		-	_			209	494	445		-				
10	400.70	710	698	500	504.9166		-				024	027	52						
10	1103	993	11097	123	700	171	6	160	494		706	/5/	074	20		100	0		
17	1102	1205	1108	647	799	1/1	.ə	102	460		790	627	973	20	-	190	U		
10	1047	1403	1650	1350	1220	744	0	005	70/		1074	1080	1280	000		000.0			
19	1000	1620	2017	1505	1521	/44	.4	030	720		1071	4770	1033	299.	4	262.9	U		
20	1001	2017	2219	2403	2101	40/		4700.4	0070 (1371	1//5	1895	4400		0000.0			
21	3105	2200	2730	2437	2450	105	U	1793.4	2073.0		1652	2280	2304	1428.	2	2229.2	U		
Days	1				PAG KO							_		PAG	KO + A	Anti-PD-1			
Days	1	0			PAG KO									PAG	KO + A	Anti-PD-1			1
Days	1	0	-		PAG KO	-								PAG	KO + A	Anti-PD-1	-		
Days	1 2 3	0		=	PAG KO									PAG	KO + A	Anti-PD-1			
Davs	1 2 3	0			PAG KO									PAG	KO + A	Anti-PD-1			
Days	1 2 3 4 5				PAG KO									PAG	KO + A	Anti-PD-1			
Days	1 2 3 4 5 6				PAG KO									PAG	KO + A	Anti-PD-1			
Days	1 2 3 4 5 6 7				PAG KO									PAG	KO + A	Anti-PD-1			
Days	1 2 3 4 5 5 6 7 7 8 154,7	0 0 0 0 0 0 91	125	117	PAG KO	79					4		37	PAG	KO + A	Anti-PD-1			
Days	1 2 3 4 5 5 6 7 7 8 154.7 9	0 0 0 0 0 0 0 0 91 60	125	117	PAG KO	79					4		37	PAG 66	KO + A	Anti-PD-1			
Days	1 2 3 4 5 5 6 7 7 8 154.7 9 1 1 9 1 1 9	0 0 0 0 0 0 91 60 65	125	117 170 199	PAG KO	79 64 76					4		37 56 112	PAG 66 75 101	KO + A	Anti-PD-1			
Days	1 2 3 4 5 6 7 7 8 154.7 9 9 1 1	0 0 0 0 0 0 791 665 70	125 140 149	117 117 170 199 213	PAG KO	79 64 76					4 4 55 7: 9		37 56 112	PAG 66 75 101	KO + A	Anti-PD-1			
Days	1 2 3 3 4 5 5 6 6 7 8 154.7 9 1 1 1 2 179.55	0 0 0 0 0 0 91 60 60 65 70	125 140 149 149	117 170 199 213 218 253	PAG KO	79 64 76 99					4 4 5 7.7 9 14		37 56 112 179 250	PAG 66 75 101 144 204	KO + A	Anti-PD-1			
Davs	1 2 3 4 5 5 6 6 7 8 154.7 9 1 1 9 1 1 2 179.5 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	125 140 149 149 91 145	117 117 170 199 213 218 253 287	PAG KO	79 64 76 99 10.808 186	15.4		76.3	35.3	4 55 7: 99 14		37 56 112 179 250 46.63	PAG 66 75 101 144 204	KO + A	Anti-PD-1		2	
Davs	1 2 3 4 5 5 6 7 7 7 9 1 1 2 179.56 3 4 2 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	125 140 149 91 155 206	117 170 199 213 218 253 287 310	PAG KO	79 64 76 99 10.808 186 285	15.4		76.3	35.3	4 55 7: 9 14 17 22		37 56 112 179 250 46.63	PAG 66 75 101 144 204 19.86 93.98	KO + A	Anti-PD-1	.2 15	2	
Davs	1 2 3 4 5 6 7 7 8 154.7 9 1 7 9 1 1 2 179.50 2 179.50 3 2 2 179.50 2 3 2 2 5 5 2 5 5 5 5 5	0 0 0 0 0 91 60 65 62 65 62 62 62 62 62 63 770 64 65 770 62 64 65 772 64 772 772 772 772 772 772 772 772 772 77	125 140 149 149 149 155 206 375	117 170 199 213 218 253 287 310 895	PAG KO 108 127 150 176 6285 1 289 310 324 311	79 64 76 99 10.808 186 265 3.8266	15.4		76.3	35.3	4 4 55 77 9 9 14 14 17 227		37 56 112 179 250 46.63 12.84 49.77	PAG 66 75 101 144 204 119.86 93.98 250	KO + A	Anti-PD-1 27	.2 15	2	
Days	1 2 3 4 5 6 6 7 7 7 8 154.7 9 9 1 1 1 2 179.55 3 2 2 4 2 4 2 4 2 5 6 6 2 3 2 2 4 2 6 6 7 7 7 7 7 7 8 154.7 5 6 6 7 7 7 7 8 154.7 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	125 140 149 91 155 206 625 376	117 170 199 213 287 310 895 420	PAG KO 108 127 150 176 6285 1 289 310 324 310	79 64 76 99 10.808 186 265 3.8266 501	15.4		76.3	35.3	4 4 5 7 7 9 9 14 17 7 222 27 27		37 56 112 179 250 46.63 12.84 49.77 269	PAG 66 75 101 144 204 119.86 93.98 250 289	KO + A	Anti-PD-1 27	· · · · · · · · · · · · · · · · · · ·	2	
Davs	1 2 3 4 5 5 6 7 7 0 1 1 1 1 1 2 179.55 3 3 2 4 4 2 5 2 4 5 5 5 6 7 7 7	0 0 0 0 0 0 0 91 60 60 65 770 525 525 5240 240 240	125 140 149 91 155 206 225 378 303 450	117 1170 199 213 287 310 895 420 556	PAG KO 108 127 150 176 6285 1 289 310 324 311 441	79 64 76 99 10.808 186 265 3.8266 501 681	15.4		76.3	35.3	4 4 50 99 14 14 177 222 277 277		37 56 112 179 250 46.63 12.84 49.77 269 30.1	PAG 66 75 101 144 204 119.86 193.98 250 289 321	KO + A	Anti-PD-1 27	.2 15	2	
Days	1 2 3 4 5 5 6 7 7 9 1 5 7 9 1 1 1 2 179.56 3 2 4 2 5 2 4 2 5 5 2 4 2 5 5 7 7 8 154.7 9 1 7 8 154.7 9 1 7 8 154.7 9 1 7 8 1 5 4 7 8 1 5 4 7 8 1 5 4 7 9 1 1 5 4 7 9 1 1 5 4 7 9 1 1 5 4 7 9 1 1 5 4 7 1 5 5 5 7 7 1 5 4 7 7 1 5 4 7 7 9 1 1 5 4 7 7 9 1 1 5 4 7 7 9 1 1 5 4 7 7 1 5 4 7 7 1 5 4 7 7 1 5 4 7 7 1 5 4 7 7 7 1 5 4 7 7 7 7 7 9 1 1 5 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	125 140 149 149 155 206 525 376 303 450	117 170 199 213 287 310 895 420 556 753	PAG KO 108 127 150 6285 1 289 310 324 310 600 603	79 64 76 99 10.808 188 265 3.8266 501 681 789	15.4		76.3	35.3	4 4 55 77 99 91 14 177 277 277 277 18		37 56 112 179 250 46.63 12.84 49.77 269 301	PAG 66 75 101 144 204 193.98 250 289 321 306	KO + A	27 423	.2 15	2	
Days	1 2 3 4 4 5 5 6 8 154.7 7 9 9 1 1 1 1 7 5 2 179.5 6 3 2 179.5 6 3 2 179.5 6 3 2 179.5 6 3 2 179.5 6 8 154.7 7 8 154.7 7 8 154.7 7 8 155.5 8 154.7 7 8 155.5 155.5 8 155.5 15	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	125 140 149 149 155 206 205 303 376 303 376 363 842	117 170 199 213 287 310 895 420 556 753 931	PAG KO 108 127 160 176 176 176 176 176 176 176 176	79 64 76 90,808 186 3,8266 501 681 7789 1190	15.4		76.3	35.3	4 55 7; 9 9 14 17; 17; 27; 27; 27; 27; 27; 18 45; 60;		37 56 112 250 46.63 250 46.63 12.84 49.77 269 301 447	PAG 66 75 101 144 204 19.86 250 269 289 321 305	KO + A 30.4 395.1	27 423 617			
Days	1 2 3 4 4 5 6 7 7 8 154.3 9 9 1 1 1 2 179.55 2 6 4 2 5 2 4 4 2 5 2 6 5 7 7 5 5 7 9 9 154.3 9 9 154.3 9 9 154.3 9 9 154.3 9 9 154.3 9 15 15 154.3 9 15 15 15 15 15 15 15 15 15 15 15 15 15	0 0 0 0 0 91 66 66 66 66 70 70 70 72 70 70 72 70 70 70 70 70 70 70 70 70 70 70 70 70	125 140 149 149 91 155 206 825 376 303 450 336 450 250 336	117 170 199 213 287 310 1895 420 556 753 831 556 753 831 956	PAG KO PAG KO 108 127 150 176 176 176 2289 310 324 310 324 311 600 633 1046	79 64 76 99 186 265 3.8266 501 681 789 1190	15.4 64 136.1		76.3	35.3 766.1 1023.4	4 4 5 7 7 7 9 9 9 9 9 9 9 14 4 17 7 7 27 7 27 7 27 7 8 8 60 60 7 8 6		37 56 112 179 250 12.84 49.77 269 301 44.7 440 44.7	PAG 66 75 101 144 204 93.99 250 2289 321 325 2289 321 305 337	KO + A	Anti-PD-1 27 423 617	2.2 15 2.2 1 2.2 1		

Supplementary Table 7. Adoptive Cell Transfer Tumor Measurements

Days		-	WT	ACT	_	_	PAG KO ACT							
4	15.110016	12.025874	11.2168125	36.1	33.7211875	24.4089375	6.593535	11.2519425	7.10124	24.5934315	33.9015555	17.4421875		
5	47.82528	38.406175	37.866318	59.5	70.2	43.5	39.9906315	25.80565	51.5780485	46.6	48.6	27.5		
6	83.291475	67.268268	67.528027	62.7	72.498168	40.490464	69.679106	37.9516025	67.537072	56.3022495	44.976384	22.775877		
7	108.409291	96.882339	91.0940625	79.4	85.86368	86.3374	65.28918	55.4617125	75.750552	69.049096	81.832842	55.581058		
8	117.855744	110.230116	95.84685	92.7	83.4967255	113.872676	69.917328	49.132252	69.727686	96.1253835	94.7000925	49.515176		
9	112.484714	93.6096	93.9168625	112	97.314392	95.50135	70.909952	43.52175	75.1078125	130.112864	149.3284	86.5628		
10	133.3223	96.86911	105.456	148.2	92.31453	130.447284	67.162368	70.153864	68.8286255	146.849472	157.074515	84.21745		
11	131.500567	123.1254	132.631448		124.436316	120.115331	75.146566	98.464382	92.530107	146.202	203.738328	38.263752		
12	176.112792	112.749325	158.129885		118.5921	158.042836	78.381056	92.942154	81.238113	198.724314	180.895478	44.255232		
13	194.490432	137.5528	175.950425		162.1	202.6	89.010492	107.516448	98.069562	238.9	179.7	23.8		
14	206.525344	164.122378	206.3484		231.6	301.2	96.0362325	97.185816	79.27596	311.2	252.8	22.1		
15														
16	232.084845	186.024192	264.6		241.4	445	93.5712	99.790894	112.402404	436.1	132.5	9		
18	353.773036	304.760475	421.673548		322.6	458.8	108.684834	150.669018	145.023232	382.2	110.9	4.2		
19	491.306634	393.663888			325.5	631.6	142.93073	155.79648	164.60352	495.5	60.3	0		
20					424.7	768.5				589.1	86.4	0		
21	887.48784	559.651968					181.467841	187.965603	270.678112					
22					827.4	1404				894.7	54.3	0		
23					1025.5	1597.4				1136.6	40.8	0		
24	1261.70563	1086.89319			1112.8	1472.2	391.039101	298.415513	537.410336	1273	49.1	0		
25	1500.63188	1412.61611				2745.3	405.065026	365.523463	802.102928	1616.4	58.5	0		
26						3693.5				2565.6	45.9	0		
27														
28														