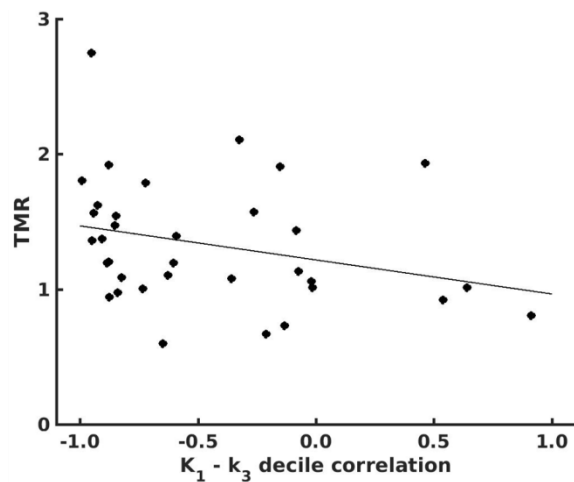**Supplemental FIGURE 1**. Bar plots of the K_1-k_3 voxel-wise R for each patient for every: (A) VOI_{Muslce}, (B) VOI_{Normal}, (C) VOI_{Tumor} and (D) using deciles of voxels in VOI_{Tumor} to increase statistical power. Each color represents an individual patient.

Supplemental FIGURE 2. Scatter plot of TMR for VOI_{Tumor} vs K_1-k_3 decile correlation coefficient. Each point represents one lesion.

Supplemental Table 1. *PKA* results for average lesion TACs for each patient (*P*).

P	VOI	vB	%SE vB	K1 (mL/min/cc)	%SE K$_1$	K$_1$/k$_2$	%SE K$_1$/k$_2$	k$_3$ (min^{-1})	%SE k$_3$	K$_i$ (mL/min/cc)	%SE K$_i$
1	1	0.04	23	0.13	6.4	0.77	2.5	7.50E-03	6	0.0055	11
2	1	0.18	9.8	0.14	5.7	0.91	1.8	1.90E-03	12	1.58E-04	15
3	1	0.06	42	0.21	14	0.59	4	2.10E-02	7.2	2.92E-03	21
	2	0.01	80	0.13	9.3	0.52	3.2	1.50E-02	5.6	2.68E-03	14
4	1	0.08	19	0.11	6.8	0.7	2.4	2.90E-03	12	2.42E-04	16
5	1	0.14	24	0.16	11	1.1	3.5	1.20E-03	33	3.64E-05	37
	2	0.17	20	0.18	9.8	1.1	3.1	1.20E-03	28	4.29E-05	31
	3	0.19	27	0.17	8.7	1.1	3.2	1.30E-03	7.1	1.83E-04	15
6	1	0.03	17	0.08	11	0.47	3.2	1.00E-02	10	1.00E-03	18
	2	0.15	8.7	0.12	4.2	0.74	1.7	4.90E-03	5.6	8.75E-04	8.3
7	1	0.10	16	0.11	7	0.74	2.3	7.50E-03	6.9	1.09E-03	12
8	1	0.14	11	0.17	11	0.96	3.7	6.10E-03	12	5.08E-04	20
	2	0.39	15	0.13	7.7	0.99	2	4.90E-03	13	3.77E-04	17
9	1	0.11	14	0.16	8.7	0.81	2.7	2.00E-03	10	2.00E-04	16
10	1	0.11	26	0.12	25	0.45	12	3.10E-03	19	1.63E-04	42
	2	0.10	8.8	0.07	21	0.18	7.9	4.50E-03	100	4.50E-05	100
	3	0.45	11	0.06	15	0.45	6.9	4.20E-04	28	1.50E-05	36
	4	0.23	13	0.07	4.6	0.3	1	1.10E-03	16	6.88E-05	17
11	1	0.09	23	0.25	11	0.79	2.4	8.20E-04	100	8.20E-06	100
	2	0.15	10	0.23	6.7	0.92	1.8	0.00E+00	48	1.00E-08	49
12	1	0.16	21	0.13	7.2	0.61	2.7	3.60E-04	10	3.60E-05	15
13	1	0.05	18	0.10	11	0.73	3.1	4.00E-03	12	3.33E-04	20
	2	0.08	15	0.11	13	0.46	3.6	3.70E-03	8.3	4.46E-04	20
	3	0.16	17	0.19	14	0.48	3.3	7.60E-03	13	5.85E-04	24
	4	0.22	13	0.21	8.4	0.65	2.7	3.30E-03	8.8	3.75E-04	15
	5	0.16	16	0.12	16	0.78	5.4	5.50E-03	56	9.82E-05	61
14	1	0.17	16	0.05	11	0.39	2.7	8.50E-04	15	5.67E-05	22
15	1	0.14	14	0.17	8.1	0.66	1.9	5.00E-03	6.3	7.94E-04	13
	2	0.09	14	0.20	8.5	0.54	2	6.20E-03	15	4.13E-04	19
16	1	0.14	16	0.18	6.8	0.61	1.5	1.20E-03	5.4	2.22E-04	11
	2	0.05	27	0.23	23	0.54	5.5	3.60E-03	100	3.60E-05	110
	3	0.29	14	0.10	15	0.79	2.9	0.00E+00	46	1.04E-22	51
	4	0.37	29	0.25	17	0.88	3.8	6.50E-04	47	1.38E-05	53
	5	0.13	21	0.23	12	0.61	3.4	6.30E-04	30	2.10E-05	35
	Average	0.15	20	0.15	11	0.69	3.4	4.1E-03	25	4.1E-03	31
	σ	0.10	13	0.06	5.0	0.23	2.1	4.5E-03	27	4.5E-03	26
	min	0.01	8.7	0.05	4.2	0.18	1.0	0.0E+00	5.4	0.0E+00	8.3
	max	0.45	80	0.25	25	1.10	12	2.1E-02	100	2.1E-02	110

Supplemental Table 2. Quantitative lesion parameters for each tumor VOI and patient (P).

P	VOI Number	Maximum SUV$_{bw}$	TBR	Volume (cc)	FHV
1	1	2.7	2.9	26	94
2	1	2.0	1.4	6.7	57
3	1	4.2	5.2	21	100
	2	3.2	4.0	13	100
4	1	13	8.0	5.2	100
5	1	2.3	1.3	2.7	50
	2	2.1	1.2	17	2.3
	3	2.6	1.5	19	43
6	1	2.5	1.9	17	100
	2	2.6	2.0	32	100
7	1	3.7	2.9	150	94
8	1	3.5	2.5	5.1	100
	2	3.0	2.1	7.6	100
9	1	2.2	1.3	64	19
10	1	2.5	1.3	28	2.1
	2	1.1	0.54	5.2	0.0
	3	1.7	0.87	8.8	0.0
	4	1.2	0.58	2.8	0.0
11	1	1.9	1.1	11	0.0
	2	1.8	1.0	2.3	0.0
12	1	2.1	0.81	2.8	0.0
13	1	5.8	1.9	11	63
	2	3.1	1.0	1.7	0.0
	3	5.3	1.7	5.6	53
	4	4.1	1.3	8.0	12
	5	5.6	1.8	8.2	95
14	1	1.6	0.71	52	0.0
15	1	2.3	1.4	22	11
	2	2.7	1.6	17	29
16	1	1.4	0.98	3.7	0.0
	2	1.9	1.3	7.7	6.3
	3	1.7	1.2	33	0.34
	4	1.6	1.1	20	0.0
	5	1.2	0.85	6.7	0.0
	Average	3.0	1.8	19	39
	σ	2.2	1.5	27	43
	min	1.1	0.54	1.7	0.0
	max	13	8.0	150	100

Supplemental Table 3. *PKA* results for average normal lung TACs.

Patient	vB	%SE vB	K_1 (mL/min/cc)	%SE K_1	K_1/k_2	%SE K_1/k_2	k_3 (min^{-1})	%SE k_3	Maximum SUV	TBR
					Normal Lung					
1	0.098	Inf	0.035	15	0.20	6.9	5.0E-03	13	0.8	0.9
2	0.20	Inf	0.033	17	0.17	9.2	3.8E-03	16	1.1	0.8
3	0.13	33	0.057	39	0.19	20	8.2E-03	26	0.8	1.1
4	0.15	12	0.023	17	0.25	6.7	0.0E+00	Inf	1.7	1.0
5	0.26	14	0.068	36	0.21	18	0.0E+00	Inf	1.1	0.6
6	0.064	7.7	0.0098	16	0.079	6.9	1.3E-04	Inf	0.6	0.5
7	0.097	11	0.0072	17	0.11	7.9	2.5E-04	12	0.4	0.3
8	0.15	7.7	0.053	31	0.19	13	4.1E-03	27	1.0	0.9
9	0.19	Inf	0.011	24	0.11	11	3.1E-03	Inf	0.7	0.5
10	0.17	17	0.041	16	0.22	6.3	0.0E+00	33	1.2	0.8
11	0.092	6.2	0.024	21	0.25	9.5	2.2E-03	33	0.6	0.4
12	0.25	Inf	0.017	25	0.17	10	1.7E-03	Inf	1.9	0.7
13	0.27	Inf	0.017	27	0.19	13	2.2E-04	Inf	2.2	0.7
14	0.13	6.6	0.0061	20	0.13	5.9	0.0E+00	Inf	0.8	0.4
15	0.13	14	0.046	25	0.11	11	1.8E-04	Inf	1.6	1.0
16	0.11	Inf	0.019	71	0.13	32	2.2E-04	Inf	0.7	0.5
Average	0.16	14	0.029	26	0.17	12	1.8E-03	23	1.1	0.7
σ	0.063	9.7	0.019	14	0.052	6.8	2.4E-03	9.3	0.5	0.2
min	0.064	6.2	0.0061	15	0.079	5.9	0.0E+00	12	0.4	0.3
max	0.27	41	0.068	71	0.25	32	8.2E-03	33	2.2	1.1

Supplemental Table 4. *PKA* results for average muscle TACs.

					Muscle					
Patient	vB	%SE vB	K_1 (mL/min/cc)	%SE K_1	K_1/k_2	%SE K_1/k_2	k_3 (min^{-1})	%SE k_3	Maximum SUV	TBR
1	0.0E+00	Inf	0.046	5.4	1.1	7.9	2.1E-03	38	1.7	1.8
2	5.8E-04	Inf	0.059	6.1	1.1	18	6.8E-05	52	1.9	1.4
3	2.5E-04	24	0.028	3.4	1.5	8.6	3.8E-03	Inf	2.2	2.8
4	7.9E-03	30	0.021	3.2	1.0	4.6	9.9E-05	44	2.0	1.2
5	6.0E-03	200	0.032	5.6	0.96	4.4	9.3E-04	20	2.3	1.3
6	1.4E-03	20	0.049	4.7	0.83	5.9	2.3E-03	26	1.6	1.4
7	2.1E-02	28	0.025	3.0	0.70	6.0	2.0E-03	Inf	1.3	1.0
8	4.2E-03	59	0.022	7.5	0.86	9.4	0.0E+00	Inf	1.6	1.4
9	4.5E-03	Inf	0.023	5.8	0.67	7.2	5.5E-05	Inf	1.6	1.0
10	0.0E+00	20	0.028	4.5	0.75	6.3	0.0E+00	53	1.7	1.1
11	1.4E-02	35	0.021	4.3	0.63	3.4	1.4E-03	36	1.6	0.9
12	7.5E-03	Inf	0.049	3.0	0.82	5.5	1.0E-03	Inf	2.9	1.1
13	0.0E+00	Inf	0.021	2.7	0.80	7.2	6.5E-05	Inf	2.9	0.9
14	0.0E+00	13	0.013	2.8	0.74	2.6	2.0E-04	Inf	1.7	0.9
15	2.1E-02	18	0.039	2.6	0.90	4.1	0.0E+00	15	1.6	1.0
16	5.6E-03	Inf	0.020	3.1	0.62	5.6	3.4E-03	Inf	1.5	1.1
Average	5.9E-03	45	0.031	4.2	0.87	6.7	1.1E-03	35	1.9	1.3
σ	7.1E-03	57	0.013	1.5	0.22	3.5	1.3E-03	14	0.5	0.5
min	0.0E+00	13	0.013	2.6	0.62	2.6	0.0E+00	15	1.3	0.9
max	2.1E-02	200	0.059	7.5	1.5	18	3.8E-03	53	2.9	2.8

Supplemental Table 5. Results of the voxelwise correlation between K_1 and k_3.

P	VOI	Tumor		Normal Lung		Muscle	
		R	p-Value	R	p-Value	R	p-Value
1	1	-0.40	<0.001	0.37	<0.001	-0.23	<0.001
2	1	0.05	0.68	0.38	<0.001	0.38	0.06
3	1	-0.48	<0.001	0.19	<0.001	-0.14	0.23
	2	-0.80	<0.001				
4	1	-0.51	<0.001	0.35	<0.001	0.53	<0.001
5	1	-0.61	<0.001	0.04	0.17	0.32	<0.001
	2	-0.64	<0.001				
	3	-0.46	<0.001				
6	1	-0.25	<0.001		0.02	-0.14	0.16
	2	-0.35	<0.001				
7	1	-0.33	<0.001	0.24	<0.001	0.56	<0.001
8	1	-0.16	0.26	-0.08	<0.001	0.82	<0.001
	2	-0.97	<0.001				
9	1	-0.42	<0.001	0.61		0.29	<0.001
10	1	0.09	0.15	0.41	<0.001	-0.08	0.92
	2	-0.45	<0.001				
	3	-0.34	<0.001				
	4	-0.16	0.46				
11	1	-0.25	0.01	-0.17	<0.001	0.90	<0.001
	2	0.12	0.59				
12	1	0.11	0.61	0.30	<0.001	-0.01	0.88
13	1	-0.07	0.45	0.50	<0.001	0.87	<0.001
	2	-0.35	0.18				
	3	-0.59	<0.001				
	4	-0.48	<0.001				
	5	0.15	0.17				
14	1	0.34	<0.001	0.44	<0.001	0.42	<0.001
15	1	-0.45	<0.001	0.30	<0.001	0.67	<0.001
	2	-0.66	<0.001				
16	1	0.37	<0.001	-0.04	0.12	-0.51	<0.001
	2	-0.42	<0.001				
	3	0.33	<0.001				
	4	0.43	<0.001				
	5	0.72	<0.001				
	Average	-0.23		0.34		0.58	
	σ	0.39		0.15		0.23	
	min	-0.97		-0.17		-0.51	
	max	0.72		0.61		0.90	