

Supplementary Table 1

Category	ID	ID	Age	Gender	Histology	Stage at Diagnosis	PET workup at diagnosis	MRI brain at diagnosis	No. of months between diagnosis to develop BM+	No. of months follow-up for BM-	RNA From Thoracic Tumor Tissue	RNA From Brain Tumor Tissue
Discovery SHC BM+ Cases (N=7)	BM+1	4	53	M	Squamous cell carcinoma	3A	y	y	7.9	N/A	x	
	BM+2	11	58	F	Adenocarcinoma	3A	y	y	11.2	N/A	x	
	BM+3	7	71	F	Squamous cell carcinoma	4	y	y	Metastasis present at diagnosis	N/A	x	
	BM+4	8	57	F	Squamous cell carcinoma	3A	y	y	5.1	N/A	x	
	BM+5	10	68	F	Adenocarcinoma	4	y	y	Metastasis present at diagnosis	N/A	x	
	BM+6	14	55	F	Adenocarcinoma	4	y	y	Metastasis present at diagnosis	N/A	x	
	BM+7	12	64	F	Adenocarcinoma	4	y	y	Metastasis present at diagnosis	N/A	x	
Discovery SHC BM- Cases (N=6)	BM-1	1	61	M	Squamous cell carcinoma	3A	v	v	N/A	1.3	x	
	BM-2*	5	67	F	Squamous cell carcinoma	4	v	v	N/A	16.2	x	
	BM-3	13	68	M	Adenocarcinoma	4	v	v	N/A	48.3	x	
	BM-4	3	62	M	Squamous cell carcinoma	1A	y	v	N/A	10.2	x	
	BM-5	2	60	F	Adenocarcinoma	4	v	v	N/A	5.9	x	
	BM-6	6	65	F	Adenocarcinoma	1B	y	y	N/A	45.8	x	
Iowa Cases (N=24)	IOWA1	219	69	M	Squamous cell carcinoma	-	-	-	-	N/A		x
	IOWA2	246	61	M	NSCLC NOS	-	-	-	-	N/A		x
	IOWA3	257	73	M	Squamous cell carcinoma	-	-	-	-	N/A		x
	IOWA4	268	76	F	Squamous cell carcinoma	-	-	-	-	N/A		x
	IOWA5	273	69	M	Squamous cell carcinoma	-	-	-	-	N/A		x
	IOWA6	275	58	M	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA7	301	77	M	NSCLC NOS	-	-	-	-	N/A		x
	IOWA8	321	65	M	NSCLC NOS	-	-	-	-	N/A		x
	IOWA9	326	48	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA10	431	62	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA11	467	53	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA12	468	49	M	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA13	469	38	M	NSCLC NOS	-	-	-	-	N/A		x
	IOWA14	479	58	M	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA15	504	65	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA16	586	63	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA17	594	64	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA18	648	56	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA19	652	60	M	NSCLC NOS	-	-	-	-	N/A		x
	IOWA20	675	58	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA21	721	63	M	Squamous cell carcinoma	-	-	-	-	N/A		x
	IOWA22	725	54	M	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA23	739	58	F	Adenocarcinoma	-	-	-	-	N/A		x
	IOWA24	740	47	F	Adenocarcinoma	-	-	-	-	N/A		x
Validation SHC BM+ Cases (N=4)	SHC1+	573	70	M	Squamous cell carcinoma	2B	y	y	3.9	N/A	x	
	SHC2+	273	53	F	Adenocarcinoma	1B	y	CT brain	9.6	N/A	x	
	SHC3+	986	59	F	Adenocarcinoma	2A	y	-	6.5	N/A	x	
	SHC4+	214	52	F	Adenocarcinoma	1A	y	-	47.8	N/A	x	
Validation SHC BM- Cases (N=11)	SHC5-	517	67	M	Squamous cell carcinoma	2B	y	y	N/A	28.5	x	
	SHC6-	466	61	M	Adenocarcinoma	1A	y	N/A	N/A	68.6	x	
	SHC7-	54	65	F	Large cell carcinoma	1A	y	N/A	N/A	31.7	x	
	SHC8-	383	64	F	Large cell carcinoma	1B	y	-	N/A	32.2	x	
	SHC9-	494	74	M	Large cell carcinoma	1B	-	-	N/A	73.7	x	
	SHC10-	719	78	F	Adenocarcinoma	1A	-	CT CAP	N/A	96.1	x	
	SHC11-	505	46	F	Adenocarcinoma	1B	y	CT brain	N/A	41.7	x	
	SHC12-	739	76	M	Adenocarcinoma	1A	CT CAP	CT brain	N/A	94.3	x	
	SHC13-	679	66	F	Adenocarcinoma	2A	y	y	N/A	43.5	x	
	SHC14-	144	53	F	Adenocarcinoma	1A	y	y	N/A	53.6	x	
	SHC15-	349	73	F	Squamous cell carcinoma	1B	y	y	N/A	58.6	x	

KEY: M: Male F:Female NOS: not otherwise specified
 N/A: not applicable -: not available NSCLC: non-small cell lung cancer
 x: RNA analyzed y: performed
 CT CAP: CT of the chest, abdomen, and pelvis