A Phase 2 study of [18F]fluoroestradiol positron emission tomography (FES-PET) as a marker of hormone sensitivity in metastatic breast cancer (MBC).

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Appendix Table 1: Patient outcomes (sorted by increasing average FES SUV dynamic)

Index - id	age	yrs since primary	# lesions (sweep)	# lesions (dynamic)	Prior endocrine therapy	ER of metastatic biopsy	Any qual. FES negative sites?	Avg FES SUV (dyn)	Geometric mean SUV (sweep, 3 highest FDG)	Average sqrt of FES/FDG (sweep, 3 lowest ratio)	Study treatment	response
1-013	67	3	1	1	AI	Positive	Yes	0.6	0.9	0.3	tamoxifen	PD
2-016	69	20	2	2	AI	Negative	Yes	0.7	0.9	0.7	tamoxifen	NA (discontinued after biopsy)
3-001	60	7	5	5	AI	Negative	Yes	0.8	0.4	0.4	tamoxifen	PD
4-014	58	10	8	3	AI, Tam	Negative	Yes	1.0	0.7	0.5		NA (chemotherapy)
5-011	48	1	12	4	None	Positive	Yes	1.1	0.8	0.3		NA (hospitalized soon after scan, never on endocrine therapy)
6-018	57	0	4	2	None	Weakly Positive	No	1.6	1.5	1.1	anastrozole	PD
7-010	75	9	8	3	AI, Tam		No	1.7	2.2	0.5	letrozole	PR
8-003	39	0	9	3	None	Weakly Positive	No	1.7	2.2	0.7	OS + letrozole + fulvestrant	PR
9-017	63	0	12	2	None	Positive	No	1.9	4.3	0.7	anastrozole	NA (surgical AE @ 2 days on AI)
10-015	64	0	4	2	None	Positive	Yes	2.0	1.3	0.8	letrozole	SD
11-019	77	24	7	4	Tam	Positive	No	2.1	1.6	0.6	anastrozole	PD
12-020	45	3	2	2	AI	Positive	No	2.6	2.8	1.0	fulvestrant	PR
13-008	42	3	4	1	AI	Positive	No	2.9	2.6	0.9	exemestane + fulvestrant	PD
14-006	65	0	6	4	None		No	3.0	3.1	0.7	letrozole	PR
15-002	62	4	11	5	AI	Positive	No	3.3	3.7	0.9	tamoxifen	PD
16-012	59	4	11	3	None		No	3.3	3.5	0.8	letrozole	PD
17-009	65	29	6	4	None	Positive	No	3.5	4.1	0.9	letrozole + fulvestrant	SD
18-004	59	13	6	3	Tam	Positive	No	5.1	4.5	1.5	letrozole + fulvestrant	SD
19-005	73	12	6	3	None		No	5.9	6.5	1.3	letrozole + fulvestrant	SD

Abbreviations: AI=Aromatase Inhibitor, Tam=tamoxifen, OS=ovarian suppression, PD=progressive disease, PR=partial response, SD=stable disease, AE=adverse event

Appendix Table 2: Paired FES PET and biopsy results for the same lesion (with other lesions reported for comparison)

Index-id	Biopsy procedure	Days FES PET after biopsy	ER Allred	Paired FES SUVmean(s) (dynamic field of view)	Paired FDG SUVmax	Paired FES SUVmean(s) (sweep)	Other lesions FES SUVmean (sweep)	Other lesions FDG SUVmax
1-013	Ultrasound guided liver biopsy	23	5	--	--		0.9 (Sacrum)	17.3
2-016	Lung, RLL wedge resection	-62	0	--	--	--	0.7 (T4) 1.2 (R Hilar LN)	3.5 3.0
3-001	CT guided needle biopsy of T10 vertebral body	5	0	0.5	6.7	0.0	0.8 (R paratracheal) 0.9 (R hilar) 1.0 (Subcarina) 0.8 (L hilar)	8.5 4.6 3.9 3.2
4-014	Sacral bone biopsy	2	0	--	5.3	0.6	0.7 (C7) 0.3 (T9) 0.8 (T3) 1.0 (L4) 0.4 (R Rib) 0.6 (R Femur) 0.6 (T11)	5.2 3.7 4.9 4.7 2.7 4.2 4.1
5-011	Liver biopsy	15	-- (ER+ by clinical read; primary 10 months earlier was Allred 3)	--	--	--	0.6 (R Paratracheal) 0.2 (T10) 0.9 (R Lung) 0.5 (L5) 0.8 (R Hilar) 0.8 (R Supraclav) 0.2 (T9) 1.0 (L Paratracheal) 0.7 (L Supraclav) 0.4 (Sacrum) 0.2 (T12) 0.3 (R Femur)	9.4 7.2 11.2 7.5 6.5 6.1 4.2 7.5 4.3 5.2 7.1 3.8
6-018	R breast core biopsy; L Iliac crest CT guided needle core biopsy	12; -11	7; Met weakly ER+ by clinic read	1.8; --	3.4; --	2.0; --	1.4 (R Hilum) 1.3 (R Axilla Low) 1.3 (R Axilla Deep)	1.8 1.3 1.3
8-003	Core biopsy - bone, L acetabulum; L	20; 85	6; 8	--	3.7 (L iliac)	1.9 (L iliac)	1.4 (R Post Rib) 2.7 (L SI) 1.1 (R Sacrum)	5.3 8.0 3.8

	breast mastectomy						1.8 (L Spine)	5.4
							2.2 (T spine)	5.6
							1.3 (R Ischium)	4.2
							1.4 (L Chestwall)	3.9
							1.1 (L Supraclav)	2.9
9-017	L breast core biopsy; R Iliac crest lesion, CT guided FNA	12; 17	8; Met ER+ by clinical read	1.7; --	2.7; 5.2	1.7; 3.4	1.1 (7th Lamina)	6.1
							1.2 (L Post 4th Rib)	3.8
							3.8 (L C1)	7.2
							1.8 (8th Vertebral Body)	3.4
							5.0 (R Pubis)	7.4
							4.4 (L Ileum)	7.1
							2.5 (L4)	3.9
							1.7 (L 3rd Rib)	2.9
							3.4 (L3)	4.6
							2.1 (L Axilla)	3.5
10-015	R breast core biopsy	39	8	2.8	4.7	2.4	0.7 (R Paratracheal LN)	4.7
							0.5 (R Iliac)	3.0
							1.4 (C5)	3.5
11-019	L axillary core biopsy	61	8	1.6 (Mid) 2.6 (Lower)	5.2 (Mid) 9.3 (Lower) 2.9 (Superior)	1.2 (Mid) 2.0 (Lower) 1.1 (Superior)	1.7 (R Subcarinal Node)	8.9
							1.2 (L AP Window)	3.5
							1.2 (R Centrl Hilar Node)	3.6
							1.0 (R Periph Hilar Node)	2.3
12-020	T7 Vertebrae, CT guided core biopsy	28	8	2.8	7.1	3.3	2.4 (R Humeral Head)	7.1
								2.5
13-008	R Scapula, CT guided FNA	8	8	2.9	4.6	2.5	2.4 (L4)	6.1
							2.9 (L ParaAortic 2)	6.3
							2.5 (L ParaAortic 1)	4.5
14-006	R supraclav LN core biopsy	7	8	3.9	11.2	3.9	2.9 (R Mid Axilla)	10.1
							2.5 (L Spine)	8.8
							2.0 (R 4th Rib)	4.2
							2.9 (R Hilar LN)	5.6
							3.4 (R Upper Mid Axilla)	5.9
15-002	Core biopsy - L axillary mass	9	8	1.9	2.8	2.6	2.0 (L Sacrum)	4.3
							3.5 (R Subcarina)	5.6
							2.0 (L Supraclav)	3.7
							4.2 (High R Paratracheal)	6.1
							3.3 (T8)	4.7
							2.5 (L2)	3.8
							2.3 (Sternum)	3.2
							3.5 (R Hilar)	5.0
								4.2

						3.0 (R Paratracheal) 3.3 (L Hilar)	3.4
17-009	Liver biopsy	16	8	--	--	--	3.8 (Sternum) 2.5 (L Humerus) 4.2 (RetroSternal Node) 2.0 (L Humeral Head) 4.5 (Mesenteric Mass 1) 4.5 (Mesenteric Mass 2)	6.3 4.5 6.4 3.4 5.2 4.0
18-004	L chest wall and pleural effusion biopsy	70	8	(all from chest wall)		(all from chest wall)	3.7 (Superior Apical) 5.6 (Anterior Apical) 4.3 (L Apical) 6.0 (Superior Medial) 4.6 (Posterior Lateral) 4.3 (Posterior Medial)	3.6 3.9 2.6 2.6 2.5 2.4
19-005	R breast core biopsy	14	8	5.5	2.5	5.6	6.5 (Medial Node) 8.3 (Mediastinum) 5.2 (R Pleura) 2.5 (Inferior R Breast) 4.1 (R IM)	5.6 6.5 5.0 1.8 2.7

Note: the header columns shown above are mis-numbered due to table structure. The table row 17-009 has values 16, 8, --, --, --; row 18-004 has 70, 8, (all from chest wall), blank, (all from chest wall); row 19-005 has 14, 8, 5.5, 2.5, 5.6.

Appendix Figure: Association between quantitative FES uptake measures and ER expression, for all lesions of patients with imaging and biopsy. (Figure 3 only shows imaging results for biopsied lesions). Panel A: FES SUVmean (dynamic scan) and Allred score. Panel B: FES SUVmean (torso scan) and Allred score.