

### Supplementary Table S3.

*Upregulated gene profile in human breast cancer MDA-MB-231 cells with fucoxanthinol (FxOH) treatment.<sup>a</sup>*

No.	Gene symbol	Description	Fold <sup>b</sup>	p-Value <sup>c</sup>
1	<i>HMOX1</i>	Heme oxygenase 1	214.7	6.5 × 10 <sup>-11</sup>
2	<i>HSPA6</i>	Heat shock 70kDa protein 6 (HSP70B)	207.8	1.3 × 10 <sup>-10</sup>
3	<i>SNAIL</i>	Snail family zinc finger 1	106.3	1.3 × 10 <sup>-9</sup>
4	<i>GDF15</i>	Growth differentiation factor 15	95.7	3.3 × 10 <sup>-12</sup>
5	<i>DDIT3</i>	DNA-damage-inducible transcript 3	73.0	2.9 × 10 <sup>-10</sup>
6	<i>ID2</i>	Inhibitor of DNA binding 2, dominant negative helix-loop-helix protein	68.7	2.9 × 10 <sup>-11</sup>
7	<i>PARM1</i>	Prostate androgen-regulated mucin-like protein 1	37.7	1.0 × 10 <sup>-9</sup>
8	<i>GADD45G</i>	Growth arrest and DNA-damage-inducible, gamma	35.1	5.3 × 10 <sup>-10</sup>
9	<i>CREBRF</i>	CREB3 regulatory factor	34.6	1.7 × 10 <sup>-11</sup>
10	<i>DNAJB9</i>	DnaJ (Hsp40) homolog, subfamily B, member 9	34.6	2.8 × 10 <sup>-11</sup>
11	<i>PTGS2</i>	Prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)	33.8	1.7 × 10 <sup>-7</sup>
12	<i>RASGEF1B</i>	RasGEF domain family member 1B	32.5	1.9 × 10 <sup>-9</sup>
13	<i>TM4SF19-TCTEX1D2</i>	TM4SF19-TCTEX1D2 readthrough (NMD candidate)	30.4	9.6 × 10 <sup>-11</sup>
14	<i>TM4SF19</i>	Transmembrane 4 L six family member 19	30.3	7.0 × 10 <sup>-10</sup>
15	<i>GEM</i>	GTP binding protein overexpressed in skeletal muscle	26.7	1.8 × 10 <sup>-10</sup>
16	<i>ARC</i>	Activity-regulated cytoskeleton-associated protein	25.5	3.1 × 10 <sup>-9</sup>
17	<i>AGR2</i>	Anterior gradient 2, protein disulphide isomerase family member	22.4	5.2 × 10 <sup>-9</sup>
18	<i>NR1D1</i>	Nuclear receptor subfamily 1, group D, member 1	21.0	6.2 × 10 <sup>-11</sup>
19	<i>ZFAND2A</i>	Zinc finger, AN1-type domain 2A	20.3	4.1 × 10 <sup>-10</sup>
20	<i>ATF3</i>	Activating transcription factor 3	20.0	2.2 × 10 <sup>-9</sup>
21	<i>HSPB8</i>	Heat shock 22kDa protein 8	20.0	3.1 × 10 <sup>-9</sup>
22	<i>RRAD</i>	Ras-related associated with diabetes	19.0	9.2 × 10 <sup>-9</sup>
23	<i>SPX</i>	Spexin hormone	18.5	1.8 × 10 <sup>-8</sup>
24	<i>RGS2</i>	Regulator of G-protein signaling 2	18.4	6.0 × 10 <sup>-9</sup>
25	<i>TRIB3</i>	Tribbles pseudokinase 3	18.3	1.4 × 10 <sup>-9</sup>
26	<i>HSPA1A</i>	Heat shock 70kDa protein 1A; heat shock 70kDa protein 1B	17.8	3.1 × 10 <sup>-10</sup>
27	<i>OLAH</i>	Oleoyl-ACP hydrolase	16.1	1.1 × 10 <sup>-8</sup>
28	<i>RHOB</i>	Ras homolog family member B	15.9	4.7 × 10 <sup>-8</sup>
29	<i>MMP1</i>	Matrix metalloproteinase 1	15.2	1.1 × 10 <sup>-9</sup>
30	<i>KDM6B</i>	Lysine (K)-specific demethylase 6B	15.0	5.7 × 10 <sup>-9</sup>
31	<i>HSPA1B</i>	Heat shock 70kDa protein 1B; heat shock 70kDa protein 1A	15.0	3.6 × 10 <sup>-10</sup>
32	<i>CLEC2B</i>	C-type lectin domain family 2, member B	14.7	5.9 × 10 <sup>-9</sup>
33	<i>GABARAPL1</i>	GABA(A) receptor-associated protein like 1	14.6	4.7 × 10 <sup>-10</sup>
34	<i>LURAPIL</i>	Leucine rich adaptor protein 1-like	14.4	1.2 × 10 <sup>-8</sup>
35	<i>BEX2</i>	Brain expressed X-linked 2	13.4	3.3 × 10 <sup>-8</sup>
36	<i>MXD1</i>	MAX dimerization protein 1	13.4	3.9 × 10 <sup>-10</sup>
37	<i>VPS11</i>	VPS11, CORVET/HOPS core subunit [Source:HGNC]	12.6	7.1 × 10 <sup>-10</sup>

		Symbol;Acc:HGNC:14583]		
38	<i>NPY1R</i>	Neuropeptide Y receptor Y1	12.5	$3.1 \times 10^{-9}$
39	<i>TNFSF9</i>	Tumor necrosis factor (ligand) superfamily, member 9	12.4	$2.6 \times 10^{-8}$
40	<i>KLHL24</i>	Kelch-like family member 24	12.0	$1.5 \times 10^{-8}$
41	<i>SAT1</i>	Spermidine/spermine N1-acetyltransferase 1	11.7	$1.0 \times 10^{-7}$
42	<i>PLIN2</i>	Perilipin 2	11.6	$2.2 \times 10^{-9}$
43	<i>CXCL8</i>	Chemokine (C-X-C motif) ligand 8	11.6	$4.6 \times 10^{-9}$
44	<i>ADM</i>	Adrenomedullin	11.6	$1.4 \times 10^{-9}$
45	<i>ERO1B</i>	Endoplasmic reticulum oxidoreductase beta	11.5	$6.0 \times 10^{-9}$
46	<i>DEDD2</i>	Death effector domain containing 2	11.4	$1.5 \times 10^{-9}$
47	<i>ZNF844</i>	Zinc finger protein 844	11.2	$5.1 \times 10^{-9}$
48	<i>MAP1LC3B</i>	Microtubule-associated protein 1 light chain 3 beta	11.1	$5.3 \times 10^{-10}$
49	<i>DUSP10</i>	Dual specificity phosphatase 10	10.9	$7.7 \times 10^{-10}$
50	<i>DNAJB1</i>	DnaJ (Hsp40) homolog, subfamily B, member 1	10.7	$2.7 \times 10^{-9}$
ECM receptor interaction signal				
	<i>TNC</i>	Tenascin C	3.9	$6.6 \times 10^{-8}$
	<i>SPP1</i>	Secreted phosphoprotein 1	2.9	0.0001
	<i>LAMAI</i>	Laminin, alpha 1	6.5	$8.8 \times 10^{-6}$

<sup>a</sup> Among all 1,293 upregulated genes with significant alterations, the top 50 genes (fold) with 3 genes belonging to ECM receptor interaction signal were shown. <sup>b</sup> Fold change of gene expression in MDA-MB-231 cells with FxOH treatment, compared with that of control cells. <sup>c</sup> Significant difference between MDA-MB-231 cells with and without FxOH treatment using one-way ANOVA ( $n=3$ ).