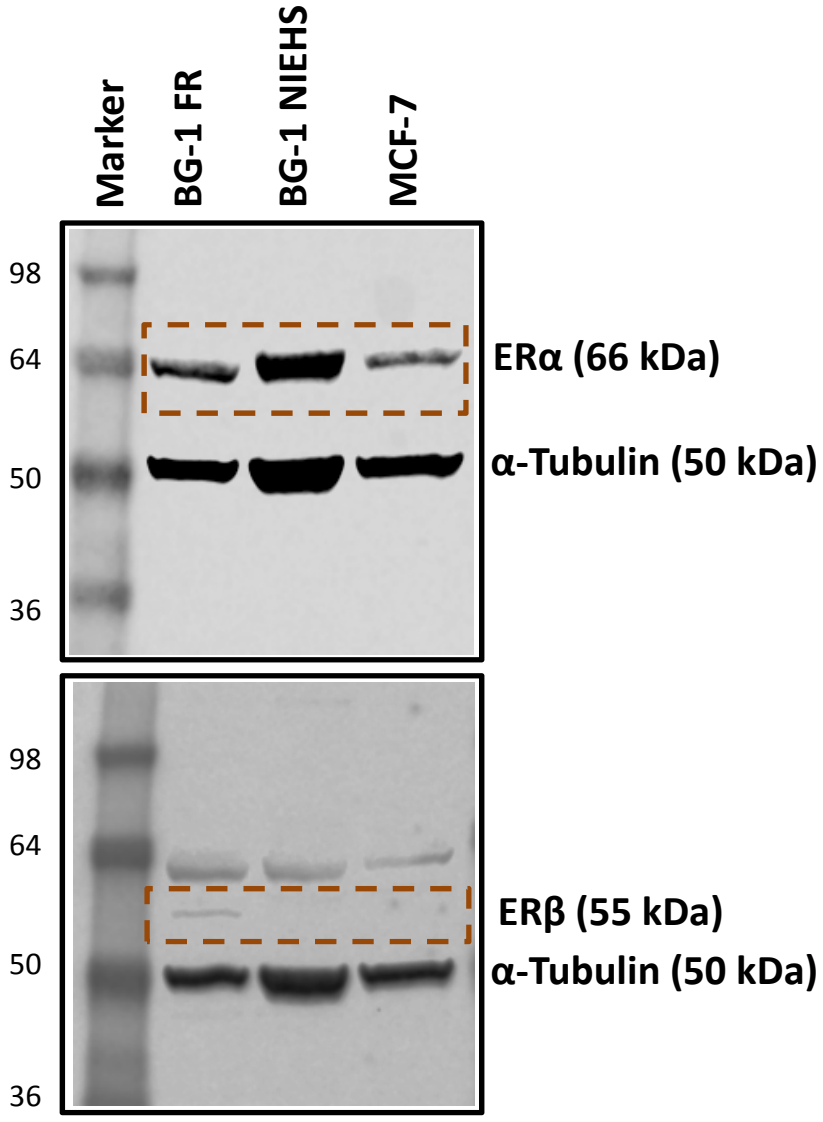
Supplemental Figure 1

sFigure 1. Western blot for ERs. The samples were loaded on 10% Tris-Glycine SDS-PAGE gel . The protein levels was detected by anti- ERα (clone: HC-20, 1:500 dilution) or anti-ERβ (clone: H-150, 1:500 dilution). The immunoreactive products were detected by Fc ODYSSEY image system (LI-COR Biosciences). α-Tubulin was used as a loading control.



Marker: SeeBlue Plus2 Pre-Stained Standard (Invitrogen)

Supplemental Table 1

sTable 1. Real-time PCR primers used in this study

Gene symbol and GenBank accession number	**Sequence (5' – 3')**
Human *ESR1* (NM_000125)	F: TAGAGGGCATGGTGGAGATCT R: CAAACTCCTCTCCCTGCAGAT
Human *ESR2* (NM_001040275)	F: GCCGACAAGGAGTTGGTACAC R: CAGGCTGAGCTCCACAAAGC
Human *FBLN1C* (NM_001996)	F: CCGCTGCCTGGCCTTCGA R: CCTCCTCATTGCCGCCG
Human *CLDN3* (NM_001306)	F: AACACCATTATCCGGGACTTCT R: GCGGAGTAGACGACCTTGG
Human *GREB1* (NM_014668)	F: CAAAGAATAACCTGTTGGCCC R: GACATGCCTGCGCTCTCATAC
Human *PGR* (NM_000926.4)	F: GACGTGGAGGGCGCATAT R: GCAGTCCGCTGTCCTTTTCT
Human *pS2/TFF1* (NM_003225.2)	F: GCCCTCCCAGTCTGCAAATA R: CTGGAGGGACGTCGATGGTA
Human *WSP2* (NM_003881)	F: TGAGCGGCACACCGAAGAC R: ACAGCCATCCAGCACCAG
Human *β-actin* (NM_001101)	F: GACAGGATGCAGAAGGAGATCAC R: GCTGATCCACATCTGCTGGAA

Supplemental Table 2

sTable 2. Translocations identified in MCF-7 and BG-1 NIEHS

Published report (ref. 47)	**MCF-7 (used in this study)**	**BG-1 NIEHS**	Cell specific translocation
der(1)(t(1;21)t(9;21)			
	del(1q) ***not all cells***		**MCF-7**
	der(1)t(1;20;9)	der(1)t(1;20;9)	
-1			
der(2)t(2;3)(q34;?)	der(2)t(2;3)(q34;?)	der(2)t(2;3)(q34;?)	
+2	+2	+2	
+3			
del(3)(p14)	**del(3)(p14)**		**MCF-7**
der(3)(t(3;11)(p14q13)	der(3)t(3;11;3)(p14q13q11)	der(3)t(3;11;3)(p14q13q11)	
-4			
	der(4)t(4;8)	der(4)t(4;8)	
-5		**del(5p)** ***not all cells***	**BG-1 NIEHS**
+5	+5	+5	
	der(5)t(5;9)	der(5)t(9;5)	
+6	+6	+6	
der(6)t(6;17;16)(q25;21;?)			
del(6)(q25)			
	der(6)t(6;14) ***not all cells***		**MCF-7**
	der(6)t(6;3)	der(6)t(6;3)	
dup(7)(p13p15)			
der(7)t(1;7)(?;p15)	**der(7)t(1;11;7)**		**MCF-7**
		der(7)t(1;15;7)	**BG-1 NIEHS**
der(20)t(7;20)t(1;7)t(1;7)	der(7)t(7;20;1)	der(7)t(1;20;15;7)	
		der(7)t(10;7)	**BG-1 NIEHS**
der(8)t(8;15)(p11;?)	der(8)t(8;15)(p11;?)x2	der(8)t(8;15)(p11;?)x2	
-8	-8	-8	
	der(8)t(1:8)	der(8)t(1;8)	
-9			
+9			
	der(9)t(9;8)	der(9)t(9;8)	
del(10)t(7;10)(?;p14)	del(10)t(7;10)(?;p14)x2	del(10)t(7;10)(?;p14)	
		der(10)t(10;22)	**BG-1 NIEHS**
		der(10)t(10;12;14)	**BG-1 NIEHS**
-11			
+12	+del(12)(q24qter)	+del(12)(q24qter)	
der(12)t(8;12)(q11;p11)	der(12)t(8;12)(q11;p11)	der(12)t(8;12)(q11;p11)	
	del(13)	del(13)	
	der(13)t(13;15)	der(13)t(13;15)	
	der(13)t(16;13)		**MCF-7**
		del(14)	**BG-1 NIEHS**
+14	+14	+14	
	der(15)t(15;3)	der(15)t(15;3)	
	der(15)t(15;16)	der(15)t(15;16)	
	der(16)t(16;15)	der(16)t(16;15)	
	del(16)	del(16)	
der(16)t(8;16)(q?;q11.2)	der(16)t(8;16)(q?;q11.2)	der(16)t(8;16)(q?;q11.2)	
der(16)t(16;19)(q21;?)		*der(19)t(19;11;16)*	
der(17)t(17;19)(p11.1;p12)	der(17)t(17;19)(p11.1;p12)	der(17)t(17;19;1)	
der(17)t(8;17)t(1;8)	**der(17)t(17;19;15)**		**MCF-7**
	der(17)t(17;20;1)	der(17)t(17;20;1)	
	del(18)	del(18)	
der(19)t(12;19)(q13;q13.3)	der(19)t(12;19)(q13;q13.3)	der(19)t(12;19)(q13;q13.3)	
		der(19)t(19;11;17)	**BG-1 NIEHS**
	del(20)(pterp11)	del(20)(pterp11)	
-20	-20	-20	
	der(20)t(20;11)	der(20)t(20;1;11;3)	
	der(20)t(20;3)		
	der(20)t(20;16;6)	der(20)t(17;1;11;20)	
	+21		**MCF-7**
		der(21)t(3;21)	**BG-1 NIEHS**
	der(22)t(7;22)	der(22)t(7;22)	
der(X)dup(X)(q21qter)	der(X)dup(X)(q21qter)	der(X)dup(X)(q21qter)	

Supplemental Table 3

sTable 3. The categories of overlapped genes in the 3 cell lines

upregulated 42 genes

GeneName	BG-1 FR	BG-1NIEHS	MCF-7
ADAMTS4	4.14763	11.1417	6.41357
AK125361	1.79992	7.61396	28.9051
AL137566	4.74837	4.83858	3.93256
BRIP1	2.31763	1.90691	1.69338
C3	1.72545	1.53002	1.85827
C4orf25	1.63222	2.04689	2.41971
CDH26	3.41333	3.94815	5.76472
CDH26	2.68553	3.77925	6.21432
CILP2	1.9964	1.70419	1.73151
CR616845	2.4362	2.68923	2.32537
CTSD	1.51257	2.70376	2.32463
DEPDC6	1.97641	2.56211	2.82242
EGR3	3.22156	8.61291	5.76926
EIF5A	1.51288	1.67344	1.70173
ENST00000382123	1.74752	1.82562	2.16205
FLJ10847	2.54592	3.81789	2.07563
FLJ10847	1.78085	2.94424	2.06013
FLJ20366	2.99741	2.34475	2.62865
FMN1	1.70484	3.18767	2.83976
FRK	2.00084	1.91876	3.27881
GREB1	2.93198	3.70481	3.19725
H19	2.66282	2.04543	4.22
IL17RB	2.1699	3.18964	2.82805
LOXL4	5.16355	4.4533	16.9325
PCP4	1.87831	2.33864	2.28258
PGR	3.84815	4.62321	4.171
POLE2	1.67222	2.07341	1.96202
RAPGEFL1	1.74255	2.87167	3.30436
RGS22	1.78291	3.94602	3.63609
SEMA3B	1.83553	1.94855	2.55071
SEMA3B	1.79743	1.56486	2.38028
SERPINA1	2.07024	2.66103	2.05944
SERPINA3	2.54733	7.74651	3.09921
SERPINA5	1.5428	3.74372	2.90378
SPINK4	3.50501	2.32449	2.99821
STC2	1.71198	1.60562	1.50087
TGM2	1.97018	1.91275	1.92466
THC2338185	1.54437	2.60917	1.70689
THC2411757	1.76594	2.07077	3.52991
TIPARP	1.53958	2.54377	1.79299
UGT2B11	2.42996	12.274	7.53155
XBP1	2.40789	3.7515	2.22484

downregulated 39 genes

GeneName	BG-1 FR	BG-1NIEHS	MCF-7
AF075027	-1.57169	-2.07317	-2.47478
AKR1B10	-1.76931	-3.43081	-2.32423
ANGPTL4	-1.86185	-2.92056	-2.16278
ANXA3	-1.59907	-1.56718	-1.68685
AQP3	-1.50556	-2.69677	-1.7961
AQP3	-1.68302	-3.00292	-1.87848
ARL4D	1.63195	-1.7014	-2.89965
ATP6V0A4	-1.56422	-5.78326	-6.35273
BBC3	-1.61795	-1.8194	-1.99156
BMF	-1.5697	-3.33382	-5.69245
CAPN13	-1.53815	-1.82945	-1.57754
CDKN1C	-1.96355	-1.61172	-2.49228
CEACAM6	-1.62052	-3.409	-2.02404
CST6	-2.66327	-2.32518	-2.57661
ENC1	-2.34892	-2.4618	-1.89255
ENST00000366930	-3.65341	-4.92936	-2.84672
FLJ22536	-1.81051	-1.73839	-2.24198
GDPD3	-1.64802	-2.33831	-2.624
HES1	-1.82572	-1.67064	-1.55545
HES1	-1.63584	-2.00125	-1.52566
IGFBP3	-2.4476	-7.71721	-1.8125
ITGB6	-2.12324	-4.46704	-2.67779
JUNB	-1.80183	-1.86857	-1.72457
KRT86	-1.54758	-4.26388	-2.70051
LOC54103	2.83161	-1.93869	-1.72619
MB	-1.52494	-1.72528	-2.26718
NDRG1	-1.51554	-1.64357	-1.77276
NT5E	-1.90731	-2.37739	-2.52151
NT5E	-1.92675	-3.25468	-3.1625
NTN4	-1.7268	-2.35235	-2.00699
PLAU	-3.00667	-2.40974	-1.59594
RIPK4	-1.50612	-1.77137	-1.66463
SERPINB1	-1.77158	-1.60882	-2.06752
SH3TC2	-2.1196	-3.53474	-3.03302
SOX2	-1.51358	-2.13816	-1.83028
SRPX	-1.8207	-2.08386	-1.96477
ST8SIA4	-1.98129	-4.26187	-2.61584
TGM1	-1.54538	-2.10089	-1.94198
TMEM88	-1.75584	-2.39717	-2.30912

down in BG-1 FR; up in BG-1 NIEHS, MCF-7

GeneName	BG-1 FR	BG-1NIEHS	MCF-7
ARHGDIB	-1.75472	1.66134	1.60124
CA8	-1.80352	2.01737	2.63004
CCK	-1.77182	1.82376	1.79591
CD44	-1.7374	2.32576	1.90259
CD68	-1.5529	2.42711	1.68958
CR597597	-2.58036	1.88831	2.24516
CR603668	-1.72755	1.80539	4.50529
DUSP5	-1.83825	2.02706	1.77007
FGF18	-1.66972	2.86009	1.7486
KRT15	-1.80913	1.74142	2.38361
LAMA3	-1.91839	2.75711	2.22159
PHLDA1	-1.85721	3.28465	2.11434
PHLDA1	-2.44785	3.10715	2.03652
PHLDA1	-2.68056	2.9144	2.11418
PHLDA1	-1.87097	1.70635	1.71521
SPOCD1	-1.75611	1.91442	2.79439
SVIL	-1.50753	1.54232	1.83472
TNS4	-1.52714	2.23448	2.58232

up in BG-1 FR; down in BG-1 NIEHS, MCF-7

GeneName	BG-1 FR	BG-1NIEHS	MCF-7
BLNK	1.74419	-3.89393	-5.00886
CAPN9	2.58716	-1.69334	-1.95042
CLIC5	2.14443	-2.34225	-4.59739
CTGF	2.49595	-2.56466	-2.62471
CTNND2	2.31307	-2.44387	-2.07039
EDN2	1.788	-2.0864	-2.02047
GOLT1A	2.09189	-1.72704	-1.64422
INHBB	2.51761	-1.75321	-1.54057
JAM2	5.71851	-2.50445	-3.26989
KIAA1505	5.52101	-1.50045	-1.60493
SAMD11	3.3215	-1.66286	-1.69427
SLC6A14	2.66447	-1.79063	-1.67973
SRGAP3	1.96537	-2.05997	-2.0318
THC2279735	2.2345	-1.71	-1.53365

Supplemental Table 4

sTable 4. INGENUITY pathway analysis – Top 3 Molecular and cellular functions

Analysis of E2-responsive 274 genes only in BG-1 FR cells		
Categories	# genes	p-value
1. Cellular growth and proliferation	91	3.48E-08 - 7.07E-03
2. Cell death and survival	89	5.80E-11 - 8.20E-03
3. Cellular development	85	5.55E-08 - 7.53E-03
Analysis of E2-responsive 1509 genes only in BG-1 NIEHS cells		
Categories	# genes	p-value
1. Cellular development	243	2.98E-05 - 4.45E-03
2. Cell function and maintenance	151	6.02E-05 - 3.95E-03
3. Cell morphology	140	7.91E-05 - 3.83E-03
Analysis of E2-responsive 1453 genes only in MCF-7 cells		
Categories	# genes	p-value
1. Cellular growth and proliferation	321	6.20E-05 - 1.88E-02
2. Cellular development	266	6.20E-05 - 1.88E-02
3. Cell cycle	148	2.70E-06 - 1.90E-02

Supplemental Table 5

sTable 5. A list of publications which used BG-1 NIEHS cells

Published year	First author	Journal
2014	Kim JY	*Environ Toxicol Pharmacol* 37(3):1264-74
2014	Park MA	*Chem Res Toxicol* 27(1):119-28
2013	Hwang KA	*Toxicol Appl Pharmacol* 272(3):637-46
2013	Kang NH	*Food Chem Toxicol* 59:373-9
2013	Park MA	*Toxicology* 305 (8):41-8
2013	Hwang KA	*Int J Oncol* 42(2):733-40
2012	Kang NH	*Mol Med Rep* 6(1):151-6
2012	Park MA	*Mol Med Rep* 5(3):761-6
2012	Wang S	*J Steroid Biochem Mol Biol* 128(3-5):98-106
2011	Park MA	*Toxicol Res* 27(4):253-9
2011	Hwang KA	*Lab Anim Res* 27(2):99-107
2011	Choi JH	*Carcinogenesis* 32(4):589-96
2009	Park SH	*J Reprod Dev* 55(1):23-9
2008	Hsu EL	*Cancer Lett* 265(1):113-23
2004	Srinivas G	*Mol Carcinog* 39(1):15-25.
2003	Hall JM	*Mol Endocrinol* 17(5):792-803
2002	Rushing SR	*Arch Biochem Biophys* 403(2):189-201
2002	Rogers JM	*Mol Pharmacol* 61(6):1393-403
2001	Greenberger LM	*Clin Cancer Res* 7(10):3166-77
2000	Annab LA	*Breast Cancer Res* 2(2):139-48
2000	Rogers JM	*In Vitr Mol Toxicol* 13(1):67-82
1999	Petranka J	*J Pineal Res* 26(3):129-36.
1998	Baldwin WS	*Carcinogenesis* 19(11):1895-900
1998	Baldwin WS	*In Vitro Cell Dev Biol Anim* 34(8):649-54.
1998	Romagnolo D	*Mol Carcinog* 22(2):102-9.
1996	Ignar-Trowbridge DM	*Endocrinology* 137(5):1735-44