abcam

ab16660

Anti-Estrogen Receptor alpha antibody [SP1]

Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) is a rabbit monoclonal antibody detecting Estrogen Receptor alpha in **Western Blot, Flow Cytometry (Intra), IHC-P, ICC/IF, mIHC**. Suitable for **Human**.

- Multiplex IHC validated on the Leica BOND® MAX using Opal reagents
- Biophysical QC for unrivalled batch-batch consistency
- Over 60 publications
- Trusted since 2005

Lab Essentials | Recombinant | RabMAb | Advanced Validation | 20ul selling size

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	pH: 7.2 - 7.4 Preservative: 0.1% Sodium azide Constituents: PBS, 1% BSA
Form	Liquid
Clonality	Monoclonal
Immunogen	The exact immunogen used to generate this antibody is proprietary information.
Clone number	SP1
Purification technique	Affinity purification Protein A
Epitope	C-terminal
Concentration	0.014 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	1/200
Notes	-

Not recommended

Species	Mouse, Rat
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1/25
Notes	Incubate for 1 hour at room temperature.

Not recommended

Species	Mouse
Dilution info	-
Notes	Incubate for 1 hour at room temperature.

Species	Rat
Dilution info	-
Notes	Incubate for 1 hour at room temperature.

mIHC

Tested

Species	Human
Dilution info	1/200
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

Not recommended

Species	Rat
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/25 - 1/250
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

Not recommended

Species	Rat
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/200
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

Not recommended

Species	Rat
Dilution info	-
Notes	-

ChIC/CUT&RUN-seq

Tested

Species	Human
Dilution info	5 µg
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

Not recommended

Species	Rat
Dilution info	-
Notes	-

Target data

See full target information ESR1

Function	Nuclear hormone receptor. The steroid hormones and their receptors are involved in the regulation of eukaryotic gene expression and affect cellular proliferation and differentiation in target tissues. Ligand-dependent nuclear transactivation involves either direct homodimer binding to a palindromic estrogen response element (ERE) sequence or association with other DNA-binding transcription factors, such as AP-1/c-Jun, c-Fos, ATF-2, Sp1 and Sp3, to mediate ERE-independent signaling. Ligand binding induces a conformational change allowing subsequent or combinatorial association with multiprotein coactivator complexes through LXXLL motifs of their respective components. Mutual transrepression occurs between the estrogen receptor (ER) and NF-kappa-B in a cell-type specific manner. Decreases NF-kappa-B DNA-binding activity and inhibits NF-kappa-B-mediated transcription from the IL6 promoter and displace RELA/p65 and associated coregulators from the promoter. Recruited to the NF-kappa-B response element of the CCL2 and IL8 promoters and can displace CREBBP. Present with NF-kappa-B components RELA/p65 and NFKB1/p50 on ERE sequences. Can also act synergistically with NF-kappa-B to activate transcription involving respective recruitment adjacent response elements; the function involves CREBBP. Can activate the transcriptional activity of TFF1. Also mediates membrane-initiated estrogen signaling involving various kinase cascades. Essential for MTA1-mediated transcriptional regulation of BRCA1 and BCAS3 (PubMed:17922032). Maintains neuronal survival in response to ischemic reperfusion injury when in the presence of circulating estradiol (17-beta-estradiol/E2) (By similarity). Isoform 3. Involved in activation of NOS3 and endothelial nitric oxide production (PubMed:21937726). Isoforms lacking one or several functional domains are thought to modulate transcriptional activity by competitive ligand or DNA binding and/or heterodimerization with the full-length receptor (PubMed:10970861). Binds to ERE and inhibits isoform 1 (PubMed:10970861).

Storage

Shipped at conditions	Conditional Ambient
Appropriate short-term storage duration	1-2 weeks
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

Notes

Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) was developed by Abcam using patented rabbit monoclonal antibody technology and is validated for use in Flow Cyt (Intra), ICC/IF, IHC-P, WB, mIHC in human samples.

Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) has been cited over 62 times in peer reviewed journals and is trusted by the scientific community.

Abcams high quality manufacturing and validation processes ensure Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) has high sensitivity and specificity alongside high lot-to-lot consistency and reproducibility.

Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) has 7 independent reviews from customers.

Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) specifically detects Estrogen Receptor alpha (UniProt ID: P03372; Molecular weight: 66kDa) and is sold in 100 uL, 500 uL and 1 mL selling sizes.

Conjugation-ready, carrier free format available for antibody clone SP1 - ab18726.

Antibody clone SP1 is also available pre-conjugated to a variety of labels for your convenience - Alexa Fluor® 647, Alexa Fluor® 555, Alexa Fluor® 594, PE, APC, HRP, Alkaline Phosphatase, Alexa Fluor® 568, Alexa Fluor® 75 (ab267512, ab282199, ab282651, ab35384, ab35385, ab35386, ab38794, ab312515, ab321152).

Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) is a clone from the portfolio of Spring Bioscience (Roche) SP clones which have been optimised for immunohistochemistry (IHC).

Estrogen Receptor alpha (ERα), also known as ESR1, is a nuclear hormone receptor that binds estrogens and is expressed in about 70% of breast cancers. It plays a critical role in tumor development and progression by promoting cell division and growth when activated by estrogen.

This product has switched from a hybridoma to recombinant production format on 21st May 2020.

Patented technology
Our RabMAb® technology is a patented hybridoma-based technology for making rabbit monoclonal antibodies. For details on our patents, please refer to RabMAb® patents.

What are the advantages of a recombinant monoclonal antibody?
This product is a recombinant monoclonal antibody, which offers several advantages including:

- High batch-to-batch consistency and reproducibility
- Improved sensitivity and specificity
- Long-term security of supply
- Animal-free batch production

For more information, read more on recombinant antibodies.

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	Estrogen Receptor alpha (ER alpha) also known by the gene symbol ESR1 and the antibody clone names 6F11 is a nuclear hormone receptor with a molecular weight

	of approximately 66 kDa. It functions in the regulation of gene expression by binding to estrogen response elements (EREs) within DNA. This receptor is expressed in various tissues including breast ovary uterus and brain. ER alpha plays an important role in the physiological effects of estrogens impacting the development and maintenance of female reproductive tissues and secondary sexual characteristics.
Biological function summary	Estrogen Receptor alpha functions as part of a large transcriptional complex. Upon binding estrogen it undergoes a conformational change that allows interaction with other transcriptional regulators like ER SP1. This interaction facilitates the recruitment of coactivators or corepressors influencing the transcription of target genes involved in proliferation differentiation and cell survival. It is critical in mediating estrogen signaling pathways that contribute to normal development and function of female reproductive organs as well as cardiovascular and skeletal systems.
Pathways	Estrogen Receptor alpha engages in estrogen signaling and PI3K/AKT pathways. In estrogen signaling ER alpha interacts with proteins such as AP1 enhancing transcriptional activity related to cell growth and survival. Within the PI3K/AKT pathway ER alpha coordinates with proteins like SRC promoting cell proliferation and survival. Its actions in these pathways impact a wide variety of cellular processes influencing tissue homeostasis and growth regulation.
Associated diseases and disorders	Estrogen Receptor alpha is linked to breast cancer and osteoporosis. In breast cancer ER alpha expression is a significant factor in tumor development and progression often determining the response to hormonal treatments like tamoxifen. It collaborates with proteins like HER2 in some breast cancer subtypes affecting disease outcomes. In osteoporosis altered estrogen signaling through ER alpha leads to reduced bone density highlighting its important role in maintaining bone health and its potential as a therapeutic target.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

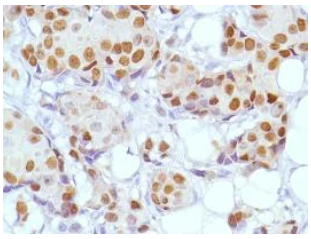
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

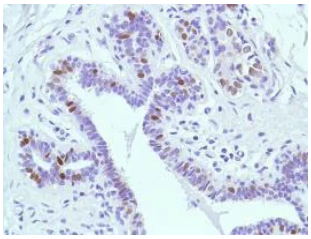
18 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human breast ductal carcinoma tissue using rabbit Anti-Estrogen Receptor alpha antibody

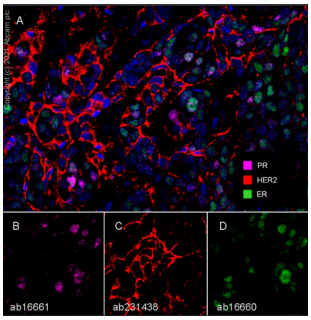
Formalin-fixed paraffin-embedded human breast ductal carcinoma tissue stained for Estrogen Receptor alpha using ab16660 at 1/200 dilution in immunohistochemical analysis.
This image was generated using the hybridoma version of the product.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

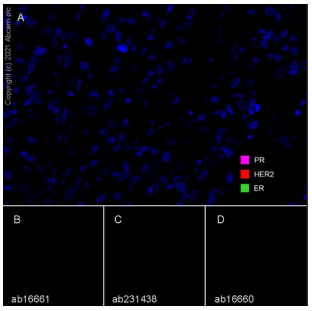
Estrogen Receptor alpha Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-Estrogen Receptor alpha antibody

Formalin-fixed paraffin-embedded human breast tissue stained for Estrogen Receptor alpha using ab16660 at 1/200 dilution in immunohistochemical analysis.
This image was generated using the hybridoma version of the product.



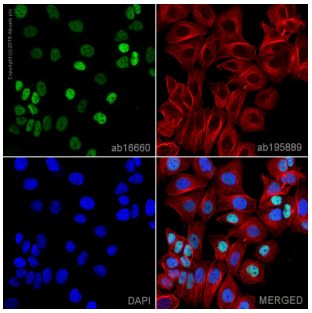
Multiplex immunohistochemistry - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Multiplex immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of Human triple-positive breast carcinoma tissue sections labeling Estrogen Receptor (ER) with ab16660, at a 1/200 dilution (0.07 µg/ml). Heat mediated antigen retrieval with Citrate buffer (pH 6.0, epitope retrieval solution 1) for 20 mins and Opal Polymer HRP Ms + Rb was used as the secondary antibody. DAPI was used as the nuclear counterstain. Panel A: merged staining of anti-Progesterone Receptor (PR) (magenta; Opal™690), anti-HER2 (red; Opal™570) and anti-Estrogen Receptor (ER) (green; Opal™520) on human triple-positive breast carcinoma. Panel B: anti-PR stained on nucleus of cancer cells. Panel C: anti-HER2 stained on membrane of cancer cells. Panel D: anti-ER stained on nucleus of cancer cells. The section was incubated in three rounds of staining: in the order of ab16661 for 30 mins, then ab16660 and ab231438 for 10 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system. The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope.



Multiplex immunohistochemistry - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

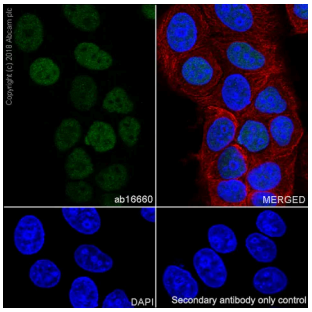
Multiplex immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of Human triple-negative breast carcinoma tissue sections labeling Estrogen Receptor (ER) with ab16660, at a 1/200 dilution (0.07 µg/ml). Heat mediated antigen retrieval with Citrate buffer (pH 6.0, epitope retrieval solution 1) for 20 mins and Opal Polymer HRP Ms + Rb was used as the secondary antibody. DAPI was used as the nuclear counterstain. Panel A: merged staining of anti-Progesterone Receptor (PR) (magenta; Opal™690), anti-HER2 (red; Opal™570) and anti-Estrogen Receptor (ER) (green; Opal™520) on human triple-negative breast carcinoma. Panel B: anti-PR stained on no cells. Panel C: anti-HER2 stained on no cells. Panel D: anti-ER stained on no cells. The section was incubated in three rounds of staining: in the order of ab16661 for 30 mins, then ab16660 and ab231438 for 10 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system. The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope.



Immunocytochemistry/ Immunofluorescence - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Immunocytochemistry/ Immunofluorescence staining of MCF7 cells using rabbit Anti-Estrogen Receptor alpha antibody

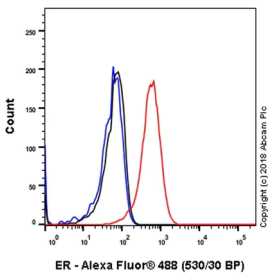
ab16660 staining Estrogen Receptor alpha in MCF7 cells. The cells were fixed with 4% formaldehyde (10min) permeabilized with 0.1% Triton X-100 for 5 minutes and then blocked with 1% BSA/10% normal goat serum/0.3M glycine in 0.1% PBS-Tween for 1h. The cells were then incubated overnight at +4°C with ab16660 at 1/250 dilution (shown in green) and ab195889 Mouse monoclonal [DM1A] to alpha Tubulin (Alexa Fluor® 594) at 2µg/ml (shown in red). Nuclear DNA was labelled with DAPI (shown in blue).
Image was taken with a confocal microscope (Leica-Microsystems TCS SP8).
This image was generated using the hybridoma version of the product.



Immunocytochemistry/ Immunofluorescence - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Immunocytochemistry/ Immunofluorescence staining of MCF7 (human breast adenocarcinoma epithelial cell) cells using rabbit Anti-Estrogen Receptor alpha antibody

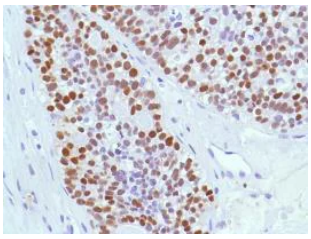
Immunocytochemistry/ Immunofluorescence analysis of MCF7 (human breast adenocarcinoma epithelial cell) cells labeling Estrogen Receptor alpha with purified ab16660 at 1/25 dilution (8.5 µg/ml). Cells were fixed in 100% Methanol. Cells were counterstained with ab195889 Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) at 1/200 dilution (2.5 µg/ml). Goat anti rabbit IgG (Alexa Fluor® 488 ab150077) was used as the secondary antibody at 1/1000 (2 µg/ml) dilution. DAPI was used as nuclear counterstain. PBS instead of the primary antibody was used as the secondary antibody only control.
This image was generated using the hybridoma version of the product.



Flow Cytometry (Intracellular) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Flow Cytometry (Intracellular) staining of MCF7 (human breast adenocarcinoma epithelial cell) cells using rabbit Anti-Estrogen Receptor alpha antibody

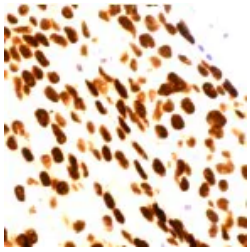
Intracellular flow cytometry analysis of MCF7 (human breast adenocarcinoma epithelial cell) labeling Estrogen Receptor alpha with purified ab16660 at 1/200 dilution (1.06 µg/ml) (red). Cells were fixed with 4% paraformaldehyde and permeabilised with 90% methanol. Goat anti rabbit IgG (Alexa Fluor® 488 ab150077) at 1/2000 dilution was used as a secondary antibody. Isotype control - Rabbit monoclonal IgG (ab172730) (black). Unlableled control - Unlabelled cells (blue).This image was generated using the hybridoma version of the product.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human ovarian adenocarcinoma tissue using rabbit Anti-Estrogen Receptor alpha antibody

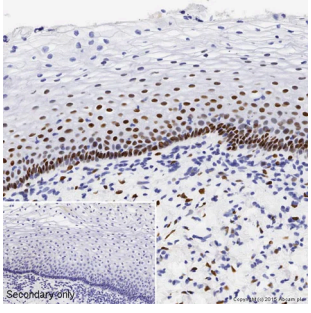
Formalin-fixed paraffin-embedded human ovarian adenocarcinoma tissue stained for Estrogen Receptor alpha using ab16660 at 1/200 dilution in immunohistochemical analysis.
This image was generated using the hybridoma version of the product.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human breast carcinoma tissue using rabbit Anti-Estrogen Receptor alpha antibody

Human breast carcinoma stained with ab16660.
This image was generated using the hybridoma version of the product.



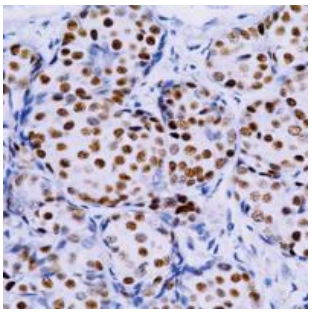
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human cervix tissue using rabbit Anti-Estrogen Receptor alpha antibody

IHC image of ab16660 staining Estrogen Receptor alpha in normal human cervix formalin-fixed paraffin-embedded tissue sections* performed on a Leica Bond. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH6 epitope retrieval solution 1) for 20 mins. The section was then incubated with ab16660 1/250 dilution for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX. No primary antibody was used in the negative control (shown on the inset).
This image was generated using the hybridoma version of the product.

For other IHC staining systems (automated and non-automated) customers should optimize variable parameters such as antigen retrieval conditions primary antibody concentration and antibody incubation times.

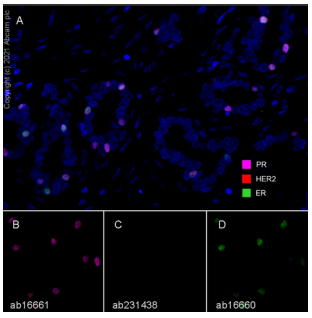
*Tissue obtained from the Human Research Tissue Bank supported by the NIHR Cambridge Biomedical Research Centre



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

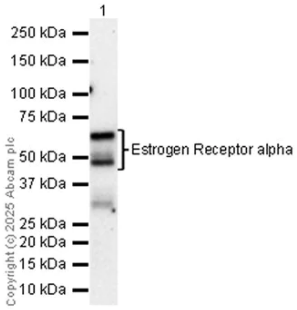
Estrogen Receptor alpha Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human breast carcinoma tissue using rabbit Anti-Estrogen Receptor alpha antibody

Formalin-fixed paraffin-embedded human breast carcinoma tissue stained for Estrogen Receptor alpha using ab16660 at 1/200 dilution in immunohistochemical analysis.
This image was generated using the hybridoma version of the product.



Multiplex immunohistochemistry - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Multiplex immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of Human mammary gland tissue sections labeling Estrogen Receptor (ER) with ab16660, at a 1/200 dilution (0.07 µg/ml). Heat mediated antigen retrieval with Citrate buffer (pH 6.0, epitope retrieval solution 1) for 20 mins and Opal Polymer HRP Ms + Rb was used as the secondary antibody. DAPI was used as the nuclear counterstain. Panel A: merged staining of anti-Progesterone Receptor (PR) (magenta; Opal™690), anti-HER2 (red; Opal™570) and anti-Estrogen Receptor (ER) (green; Opal™520) on human mammary gland. Panel B: anti-PR stained on nucleus of some ductal cells. Panel C: anti-HER2 stained on no cells. Panel D: anti-ER stained on nucleus of some ductal cells. The section was incubated in three rounds of staining: in the order of ab16661 for 30 mins, then ab16660 and ab231438 for 10 mins at room temperature. Each round was followed by a separate fluorescent tyramide signal amplification system. The immunostaining was performed on a Leica Biosystems BOND® RX instrument with an Opal™ 4-color kit. Image acquisition was performed with Leica SP8 confocal microscope.



Western blot - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha Western blot staining of T-47D (human mammary gland ductal carcinoma epithelial cell) whole cell lysates using rabbit Anti-Estrogen Receptor alpha antibody

Blocking and diluting buffer and concentration: 5% NFDM/TBST.
The expression profile/molecular weight observed is consistent with what has been described in the literature (PMID: 16165085, PMID: 31036290). The identity of the lower MW band below 37kDa is unknown.

All lanes:
Western blot - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660) at 1/1000 dilution

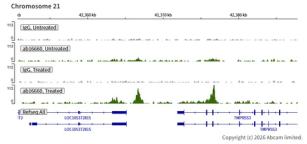
All lanes:
T-47D (human mammary gland ductal carcinoma epithelial cell) whole cell lysates at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/20000 dilution

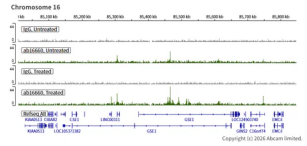
Observed band size: 46-66 kDa

Exposure time: 180s



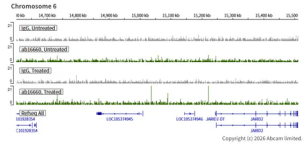
ChIC/CUT&RUN sequencing - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

ChIC/CUT&RUN was performed using a pAG-MNase at a final concentration of 700 ng/mL, 2.5 x 10^5 MCF7 (human breast adenocarcinoma epithelial cell) cells treated with phenol red free medium and 5% charcoal stripped FBS for 3 days then treated with β-estradiol (10 nM 45 min) and 5 µg of ab16660 [SP1]. The resulting DNA was sequenced on the Illumina NovaSeq 6000 to a depth of 10 million reads. The negative IgG control ab172730 is also shown. The University of Geneva owns patents relevant to ChIC (Chromatin Immuno-Cleavage) methods.



ChIC/CUT&RUN sequencing - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

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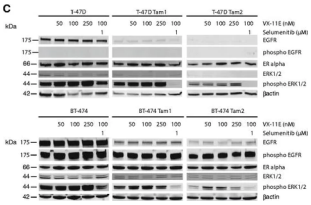
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Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Tissue Microarrays stained for Anti-Estrogen Receptor alpha antibody [SP1] using ab16660 in immunohistochemical analysis. This table provides a detailed overview of positive (tick mark) and negaive (cross mark) staining per sample type tested. The section was incubated with ab16660 for 10 mins at room temperature followed by a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (ab209101). The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Heat mediated antigen retrieval was performed with Citrate buffer (pH 6.0, Epitope Retrieval Solution 1) for 10 mins.



Western blot - Anti-Estrogen Receptor alpha antibody [SP1] (ab16660)

Estrogen Receptor alpha western blot using anti-Estrogen Receptor alpha antibody [SP1] ab16660. Publication image and figure legend from Kangaspeska, S., Hultsch, S., et al., 2016, BMC Cancer, PubMed 27378269.

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ab16660 was used in this publication in western blot. This may not be the same as the application(s) guaranteed by Abcam. For a full list of applications guaranteed by Abcam for ab16660 please see the product overview.

Tamoxifen-resistant cells develop common drug sensitivities and co-resistances. a Venn diagrams illustrate shared drug sensitivities and co-resistances of drugs with a DSS difference of at least 5. b Rank-product analysis of Drug Sensitivity Scores (DSS) between tamoxifen-resistant and parental cell lines identified statistically significant shared sensitizing and desensitizing drugs. c Western blot of EGFR, pEGFR, ERK1/2, pERK1/2, ERα and βactin under increasing concentrations of VX-11E and 1 μM selumetinib of T-47D and BT-474 isogenic cell lines. Resistant cell lines were cultured in media supplemented with 1 μM tamoxifen

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