Occludin Polyclonal Antibody
Catalog Number 40-4700

<table>
<thead>
<tr>
<th>Details</th>
<th>Species Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>100 µg</td>
</tr>
<tr>
<td>Host/Isotope</td>
<td>Rabbit / IgG</td>
</tr>
<tr>
<td>Class</td>
<td>Polyclonal</td>
</tr>
<tr>
<td>Type</td>
<td>Antibody</td>
</tr>
<tr>
<td>Immunogen</td>
<td>Synthetic peptide derived from the C-terminal region of the human occludin protein</td>
</tr>
<tr>
<td>Conjugate</td>
<td>Unconjugated</td>
</tr>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Concentration</td>
<td>0.25 mg/mL</td>
</tr>
<tr>
<td>Purification</td>
<td>Antigen affinity chromatography</td>
</tr>
<tr>
<td>Storage buffer</td>
<td>PBS, pH 7.4</td>
</tr>
<tr>
<td>Contains</td>
<td>0.1% sodium azide</td>
</tr>
<tr>
<td>Storage Conditions</td>
<td>-20°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species reactivity</th>
<th>Published species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog, Pig, Rat, Mouse, Human, Chicken, Not Applicable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tested Applications</th>
<th>Dilution *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunohistochemistry (Paraffin) (IHC (P))</td>
<td>6 µg/mL</td>
</tr>
<tr>
<td>Western Blot (WB)</td>
<td>1-3 µg/mL</td>
</tr>
<tr>
<td>Immunocytochemistry (ICC/IF)</td>
<td>1 µg/mL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Published Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunohistochemistry (IHC)</td>
</tr>
<tr>
<td>Western Blot (WB)</td>
</tr>
<tr>
<td>Immunocytochemistry (ICC/IF)</td>
</tr>
<tr>
<td>Immunohistochemistry (Paraffin) (IHC (P))</td>
</tr>
<tr>
<td>Miscellaneous PubMed (Misc)</td>
</tr>
</tbody>
</table>

| Suggested working dilutions are given as a guide only. It is recommended that the user titrate the product for use in their own experiment using appropriate negative and positive controls. |

**Product specific information**

This antibody is specific for the human occludin protein. On western blots, it identifies the target band at ~65 kDa. Reactivity has been confirmed with human Caco-2 and HT29, dog MDCK, mouse TCMK, and rat KNRK cell lysates, and mouse kidney, liver, and rat liver homogenates by western blotting, Caco-2 cells by immunofluorescence, and paraffin-embedded human small intestine tissue by immunohistochemistry. For immunofluorescence using Caco-2 cells, fixation with cold ethanol is recommended. For immunohistochemistry in paraffin-embedded tissues, enzyme digestion with pepsin is required prior to staining.

**Background/Target Information**

Occludin is a 65 kDa protein that can exist in a variety of phosphorylated forms, ranging up to approximately 82 kDa. Occludin is thought to be involved in regulating both the localization and the function of occludin. Polyunsaturated fatty acids are known to up-regulate occludin expression, increasing the transendothelial cell resistance and reducing the cellular permeability to large molecules. The level of occludin varies greatly depending on tissue; in brain tissue, occludin is highly and continuously expressed at cell-cell contact sites, whereas non-neural tissues show lower expression and discontinuous distribution. Overall structural features of the occludin protein are highly conserved in all the species examined. Under-expression of tight junction proteins, including occludin, is a key molecular abnormality responsible for the increased permeability of tumor endothelial tight junctions, which contributes to brain edemas.

Occludin Antibody (40-4700) Antibody specificity was demonstrated by detection of differential basal expression of the target across cell lines owing to their inherent genetic constitution. Relative expression of Occludin was observed in MCF7 and HEK-293 in comparison to HeLa and BJ which are reported to be low expressing for the protein, using Anti-Occludin Polyclonal Antibody (Product # 40-4700) in Western Blot. (RE)

**Occludin Antibody (40-4700) in ICC/IF**
Immunofluorescent analysis of occludin Antibody was done on 90% confluent log phase CACO2 cells. The cells were fixed with 4% paraformaldehyde for 15 minutes, permeabilized with 0.25% Triton™ X-100 for 10 minutes, and blocked with 5% BSA for 1 hour at room temperature. The cells were labeled with Occludin Antibody (Product # 40-4700) at 1µg/mL in 1% BSA and incubated for 3 hours at room temperature and then labeled with Alexa Fluor 488 Goat Anti-Rabbit IgG Secondary Antibody (Product # A-11008) at a dilution of 1:400 for 45 minutes at room temperature (Panel a: green). Nuclei (Panel b: blue) were stained with SlowFade® Gold Antifade Mountant with DAPI (Product # S36938). F-actin (Panel c: red) was stained with Alexa Fluor S94 Phalloidin (Product # A12381). Panel d is a merged image showing cell junctional localization. Panel e is a no primary antibody control. The images were captured at 40X magnification.

**Occludin Antibody (40-4700) in IHC (P)**
Immunohistochemistry analysis of Occludin showing staining in the cytoplasm and membrane of paraffin-embedded human kidney tissue (right) compared to a negative control without primary antibody (left). To expose target proteins, antigen retrieval was performed using 10mM sodium citrate (pH 6.0), microwaved for 8-15 min. Following antigen retrieval, tissues were blocked in 3% H2O2-methanol for 15 min at room temperature, washed with ddH2O and PBS, and then probed with a Occludin polyclonal antibody (Product # 40-4700) diluted in 3% BSA-PBS at a dilution of 1:20 overnight at 4°C in a humidified chamber. Tissues were washed extensively in PBST and detection was performed using an HRP-conjugated secondary antibody followed by colorimetric detection using a DAB kit. Tissues were counterstained with hematoxylin and dehydrated with ethanol and xylene to prep for mounting.

**Occludin Antibody (40-4700) in IHC (P)**
Immunohistochemistry analysis of Occludin showing staining in the cytoplasm and membrane of paraffin-embedded human liver tissue (right) compared to a negative control without primary antibody (left). To expose target proteins, antigen retrieval was performed using 10mM sodium citrate (pH 6.0), microwaved for 8-15 min. Following antigen retrieval, tissues were blocked in 3% H2O2-methanol for 15 min at room temperature, washed with ddH2O and PBS, and then probed with a Occludin polyclonal antibody (Product # 40-4700) diluted in 3% BSA-PBS at a dilution of 1:20 overnight at 4°C in a humidified chamber. Tissues were washed extensively in PBST and detection was performed using an HRP-conjugated secondary antibody followed by colorimetric detection using a DAB kit. Tissues were counterstained with hematoxylin and dehydrated with ethanol and xylene to prep for mounting.
Occludin Antibody (40-4700) in WB

Knockout of Occludin was achieved by CRISPR-Cas9 genome editing using LentiArray™ Lentiviral sgRNA (Product # A32042, Assay ID CRISPR777079_LV) and LentiArray Cas9 Lentivirus (Product # A32064). Western blot analysis of Occludin was performed by loading 30 µg of Caco-2 Cas9 (Lane 1) and Caco-2 Occludin KO (Lane 2) membrane enriched extracts. The samples were electrophoresed using NuPAGE™ Novex™ 4-12% Bis-Tris Protein Gel (Product # NP0322BOX). Resolved proteins were then transferred onto a nitrocellulose membrane (Product # IB23001) by iBlot® 2 Dry Blotting System (Product # IB21001). The blot was probed with Anti-Occludin Polyclonal Antibody (Product # 40-4700, 1.5 µg/mL dilution) and Goat anti-Rabbit IgG (H+L) Superclonal™ Recombinant Secondary Antibody, HRP (Product # A27036, 1:10,000 dilution) using the iBright™ FL 1500 (Product # A44115). Chemiluminescent detection was performed using Novex® ECL Chemiluminescent Substrate Reagent Kit (Product # WP20005). Loss of signal upon CRISPR mediated knockout (KO) using the LentiArray™ CRISPR product line confirms that antibody is specific to Occludin. Uncharacterized bands were observed in WT sample at between ~30-50 kDa.

Occludin Antibody (40-4700) in WB

Western blot was performed using Anti-Occludin Polyclonal Antibody (Product # 40-4700) and 54 kDa and 31 kDa bands corresponding to Occludin were observed in MCF7 and HEK-293 and not in HeLa and BJ which are reported to be low expressing for the protein. Whole cell extracts (40 µg lysate) of HEK-293 (Lane 1), HeLa (Lane 2), BJ (Lane 3) and MCF7 (Lane 4) were electrophoresed using NuPAGE™ 10% Bis-Tris Protein Gel (Product # NP0301BOX). Resolved proteins were then transferred onto a nitrocellulose membrane (Product # IB23001) by iBlot® 2 Dry Blotting System (Product # IB21001). The blot was probed with the primary antibody (1.5 µg/mL dilution) and detected by chemiluminescence with Goat anti-Rabbit IgG (H+L) Superclonal™ Recombinant Secondary Antibody, HRP (Product # A27036, 1:4000) using the iBright FL 1000 (Product # A32752). Chemiluminescent detection was performed using Novex® ECL Reagent Kit (Product # WP20005).
7 Immunohistochemistry References

Species / Dilution Summary

Mouse / 1:100

40-4700 was used in Immunohistochemistry to explore the mechanisms of probiotic-induced anti-infection and anti-sepsis.

International journal of molecular medicine (Mar 2019; 43: 1139)

“Lactobacillus rhamnosus GG treatment improves intestinal permeability and modulates microbiota dysbiosis in an experimental model of sepsis.”

Author(s):Chen L,Li H,Li J,Chen Y,Yang Y
PubMed Article URL:http://dx.doi.org/10.3892/ijmm.2019.4050

Mouse / 1:250

40-4700 was used in Immunohistochemistry to suggest that chronic social stress alters BBB integrity through loss of tight junction protein Cldn5, promoting depression.

Nature neuroscience (Dec 2017; 20: 1752)

“Social stress induces neurovascular pathology promoting depression.”

PubMed Article URL:http://dx.doi.org/10.1038/s41593-017-0010-3

Mouse / 1:150

40-4700 was used in Immunohistochemistry to investigate the effects of HA 35 kDa on a NEC-like murine model.

Frontiers in neurology (Dec 2022; 13: )

“Moderate systemic therapeutic hypothermia is insufficient to protect blood-spinal cord barrier in spinal cord injury.”

Author(s):Zhou R,Li J,Wang R,Chen Z,Zhou F
PubMed Article URL:http://dx.doi.org/10.3389/fneur.2022.1041099

Rat / Not Cited

40-4700 was used in Immunohistochemistry to investigate intestinal tight junction function and protects against the development of murine necrotizing enterocolitis.

Pediatric research (Jun 2020; 87: 1177)

“Hyaluronan 35kDa enhances epithelial barrier function and protects against the development of murine necrotizing enterocolitis.”

PubMed Article URL:http://dx.doi.org/10.1038/s41390-019-0563-9

Mouse / Not Cited

40-4700 was used in Immunohistochemistry to investigate intestinal tight junction barrier function in vasculitis and observe evidence of intestinal permeability and elevated circulating secretory immunoglobulin A (sIgA) in patients with Kawasaki disease, as well as elevated sIgA and IgA deposition in vascular tissues in a mouse model of vasculitis.

Immunity (Sep 2019; 51: 508)

“Intestinal Permeability and IgA Provoke Immune Vasculitis Linked to Cardiovascular Inflammation.”

PubMed Article URL:http://dx.doi.org/10.1016/j.immuni.2019.05.021

Human / 1:200

40-4700 was used in immunohistochemistry to identify the functional tight junction barrier in human epidermis.

Journal of dermatological science (Aug 2013; 71: 89)

“Functional tight junction barrier localizes in the second layer of the stratum granulosum of human epidermis.”

Author(s):Yoshida K,Yokouchi M,Nagao K,Ishii K,Akimao M,Kubo A
PubMed Article URL:http://dx.doi.org/10.1016/j.jdermsci.2013.04.021

Mouse / Not Cited

40-4700 was used in Immunohistochemistry-immunofluorescence to show that moderate systemic TH does not have a protective effect on the disrupted BSCB in early SCI.

Toxicologic pathology (Jul 2018; 46: 488)

“Intmunohistochemistry in Investigative and Toxicologic Pathology.”

Author(s):Janardhan KS,Jensen H,Clayton NP,Herbert RA
PubMed Article URL:http://dx.doi.org/10.1177/0192623318776907

14 Western Blot References

Species / Dilution Summary

Species / Dilution Summary

Mouse / 1:100

International journal of molecular medicine (Mar 2019; 43: 1139)

“Lactobacillus rhamnosus GG treatment improves intestinal permeability and modulates microbiota dysbiosis in an experimental model of sepsis.”

Author(s):Chen L,Li H,Li J,Chen Y,Yang Y
PubMed Article URL:http://dx.doi.org/10.3892/ijmm.2019.4050

Mouse / 1:250

Nature neuroscience (Dec 2017; 20: 1752)

“Social stress induces neurovascular pathology promoting depression.”

PubMed Article URL:http://dx.doi.org/10.1038/s41593-017-0010-3

Mouse / 1:150

Frontiers in neurology (Dec 2022; 13: )

“Moderate systemic therapeutic hypothermia is insufficient to protect blood-spinal cord barrier in spinal cord injury.”

Author(s):Zhou R,Li J,Wang R,Chen Z,Zhou F
PubMed Article URL:http://dx.doi.org/10.3389/fneur.2022.1041099

Rat / Not Cited

Pediatric research (Jun 2020; 87: 1177)

“Hyaluronan 35kDa enhances epithelial barrier function and protects against the development of murine necrotizing enterocolitis.”

PubMed Article URL:http://dx.doi.org/10.1038/s41390-019-0563-9

Mouse / Not Cited

Immunity (Sep 2019; 51: 508)

“Intestinal Permeability and IgA Provoke Immune Vasculitis Linked to Cardiovascular Inflammation.”

PubMed Article URL:http://dx.doi.org/10.1016/j.immuni.2019.05.021

Human / 1:200

Journal of dermatological science (Aug 2013; 71: 89)

“Functional tight junction barrier localizes in the second layer of the stratum granulosum of human epidermis.”

Author(s):Yoshida K,Yokouchi M,Nagao K,Ishii K,Akimao M,Kubo A
PubMed Article URL:http://dx.doi.org/10.1016/j.jdermsci.2013.04.021

Mouse / Not Cited

Toxicologic pathology (Jul 2018; 46: 488)

“Intmunohistochemistry in Investigative and Toxicologic Pathology.”

Author(s):Janardhan KS,Jensen H,Clayton NP,Herbert RA
PubMed Article URL:http://dx.doi.org/10.1177/0192623318776907
40-4700 was used in western blot to study the role of caspases in cytokine-induced barrier breakdown during neuroinflammation

**Human / 1:170**

Journal of Immunology (Baltimore, Md. : 1950) (Sep 2012; 189: 3130)

"Role of caspases in cytokine-induced barrier breakdown in human brain endothelial cells."

Author(s): Lopez-Ramirez MA, Fischer R, Torres-Badillo CC, Davies HA, Logan K, Pfizenmaier K, Male DK, Sharrack B, Romero IA

PubMed Article URL: http://dx.doi.org/10.4049/jimmunol.1103460

40-4700 was used in Western Blotting to suggest that facilitating O-glycan elongation, modifying the microbiota, and developing specific inhibitors to some key inflammasomes could be the options for therapy of diarrhea including human infants.

**Pig / Not Cited**

Microbiome (Aug 2022; 10:)

"Mucin O-glycan-microbiota axis orchestrates gut homeostasis in a diarrheal pig model."


PubMed Article URL: http://dx.doi.org/10.1186/s40168-022-01326-8

40-4700 was used in western blot to test if ERalpha modulates blood-brain barrier integrity and/or neuroinflammation in lupus-prone mice.

**Mouse / Not Cited**

Journal of Neuroscience (Dec 2014; 11:)

"Estrogen receptor alpha deficiency protects against development of cognitive impairment in murine lupus."

Author(s): Cunningham MA, Wirth JR, Freeman LR, Bohrer HA, Granholm AC, Gilkeson GS

PubMed Article URL: http://dx.doi.org/10.1172/jn.20130455RR

40-4700 was used in Western Blotting to suggest that nephrin may have a variety of physiological roles in human skin.

**Human / Not Cited**

FASEB journal : official publication of the Federation of American Societies for Experimental Biology (Jul 2022; 36:)

"Nephrin expression in human epidermal keratinocytes and its implication in poor wound closure."


PubMed Article URL: http://dx.doi.org/10.1061/j.fasebj.20210455RR

40-4700 was used in Western Blotting to reveal that functional BBB opening occured late in pre-established ODS lesions, and therefore was not a primary event initiating oligodendrocyte damages in the mouse model of ODS.

**Mouse / 1:500**

Neuroscience letters (Feb 2021; 746:)

"Blood-brain barrier permeability towards small and large tracers in a mouse model of osmotic demyelination syndrome."

Author(s): Scalisi J, Balau B, Deneyer L, Bouchat J, Gilloteaux J, Nicaise C

PubMed Article URL: http://dx.doi.org/10.1016/j.neulet.2021.135665

40-4700 was used in Western Blotting to investigate the effects of gonadal testosterone depletion on the integrity of capillary blood-brain barrier and the surrounding parenchyma in male mice.

**Mouse / 1:500**

Journal of Cerebral Blood Flow and Metabolism (Sep 2017; 37: 3161)

"Chronic depletion of gonadal testosterone leads to blood-brain barrier dysfunction and inflammation in male mice."

Author(s): Atallah A, Mhaouty-Kodja S, Grange-Messent V

PubMed Article URL: http://dx.doi.org/10.1177/0271678X16683961

40-4700 was used in western blot to study the effects on piglet colon tight junction composition of a diet high in fibre and fermentable proteins.

**Pig / 1:2000**

The British journal of nutrition (Mar 2014; 111: 1040)

"Diets high in fermentable protein and fibre alter tight junction protein composition with minor effects on barrier function in piglet colon."

Author(s): Richter JF, Pieper R, Zakrezewski SS, Günzel D, Schulzke JD, Van Kessel AG

PubMed Article URL: http://dx.doi.org/10.1017/s000711451303498

40-4700 was used in Western Blotting to investigate whether low-dose penicillin in late pregnancy and early postnatal life induces long-term effects in the offspring of mice.

**Mouse / 1:1,000**

Nature communications (Apr 2017; 8:)

"Low-dose penicillin in early life induces long-term changes in murine gut microbiota, brain cytokines and behavior."

Author(s): Leclercq S, Mian FM, Stanisz AM, Bindels LB, Cambier E, Ben-Amram H, Koren O, Forsythe P, Bienenstock J

PubMed Article URL: http://dx.doi.org/10.1038/ncomms15062

Products are warranted to operate or perform substantially in conformance with published Product specifications in effect at the time of sale, as set forth in the Production documentation, specifications and/or accompanying package inserts ("Documentation"). Any claim of suitability for use in applications regulated by FDA is made. The warranty provided herein is valid only when used by properly trained individuals. Unless otherwise stated in the Documentation, the warranty is limited to one year from date of shipment when the Product is subjected to normal, proper and intended usage. This warranty does not extend to anyone other than the Buyer. Any model or sample furnished to Buyer is merely illustrative of the general type and quality of goods and does not represent that any Product will conform to such model or sample.

4 Immunocytochemistry References

<table>
<thead>
<tr>
<th>Species / Dilution</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mouse / 1:500</strong></td>
<td>40-4700 was used in Western Blot to explore the role of cytochrome P4502E1 expression in the course of brain oedema induced by subacute poisoning with 1,2-dichloroethane.</td>
</tr>
<tr>
<td><strong>Pig / Not Cited</strong></td>
<td>Animal nutrition (Zhongguo xu mu shou yi xue hui) (Mar 2022; 8: 289) &quot;Heat stress-induced mucosal barrier dysfunction is potentially associated with gut microbiota dysbiosis in pigs.&quot;</td>
</tr>
<tr>
<td><strong>Human / Not Cited</strong></td>
<td>Inflammatory bowel diseases (Feb 2020; 26: 407) &quot;The JAK-Inhibitor Tofacitinib Rescues Human Intestinal Epithelial Cells and Colonoids from Cytokine-Induced Barrier Dysfunction.&quot;</td>
</tr>
<tr>
<td><strong>Rat / 1:1000</strong></td>
<td>40-4700 was used in Western Blot to study the effect of short-term heat stress on the levels of cytokines, oxidation status, intestinal morphology and permeability, and relative expressions of tight junction proteins in the ileum and cecum of pigs.</td>
</tr>
<tr>
<td><strong>Rat / 1:1000</strong></td>
<td>40-4700 was used in Western Blot to explore the protective effect and mechanism of glycine on apoptosis and dysfunction in intestinal barrier induced by brefeldin A, an endoplasmic reticulum stress inducer.</td>
</tr>
<tr>
<td><strong>Pig / Not Cited</strong></td>
<td>Animal nutrition (Zhongguo xu mu shou yi xue hui) (Mar 2022; 8: 1) &quot;Glycine represses endoplasmic reticulum stress-related apoptosis and improves intestinal permeability by activating mammalian target of rapamycin complex 1 signaling.&quot;</td>
</tr>
</tbody>
</table>

40-4700 was used in Western Blot to study the effect of short-term heat stress on the levels of cytokines, oxidation status, intestinal morphology and permeability, and relative expressions of tight junction proteins in the ileum and cecum of pigs.


Products are warranted to operate or perform substantially in conformance with published Product specifications in effect at the time of sale, as set forth in the Production documentation, specifications and/or accompanying package inserts ("Documentation"). Any claim of suitability for use in applications regulated by FDA is made. The warranty provided herein is valid only when used by properly trained individuals. Unless otherwise stated in the Documentation, the warranty is limited to one year from date of shipment when the Product is subjected to normal, proper and intended usage. This warranty does not extend to anyone other than the Buyer. Any model or sample furnished to Buyer is merely illustrative of the general type and quality of goods and does not represent that any Product will conform to such model or sample.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, ARE GRANTED INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR NON-INFRINGEMENT. BUYER'S EXCLUSIVE REMEDY FOR NON-CONFORMING PRODUCTS DURING THE WARRANTY PERIOD IS LIMITED TO REPAIR, REPLACEMENT OR REFUND FOR THE NON-CONFORMING PRODUCT. THERE IS NO OBLIGATION TO REPAIR, REPLACE OR REFUND FOR PRODUCTS AS THE RESULT OF (I) ACCIDENT, DAMAGE OR EVENT OF FORCE MAJEURE, (II) MISUSE, FAULT OR NEGLIGENCE OF OR BY BUYER, (III) USE OF THE PRODUCTS IN A MANNER FOR WHICH THEY WERE NOT DESIGNED, OR (IV) IMPROPER STORAGE AND HANDLING OF THE PRODUCTS. Unless otherwise expressly stated on the Product or in the documentation accompanying the Product, the Product is intended for research only and is not for diagnostic uses, in vivo diagnostic uses, ex vivo or in vitro therapeutic uses, or any type of consumption by or application to humans or animals.


Products are warranted to operate or perform substantially in conformance with published Product specifications in effect at the time of sale, as set forth in the Production documentation, specifications and/or accompanying package inserts ("Documentation"). Any claim of suitability for use in applications regulated by FDA is made. The warranty provided herein is valid only when used by properly trained individuals. Unless otherwise stated in the Documentation, the warranty is limited to one year from date of shipment when the Product is subjected to normal, proper and intended usage. This warranty does not extend to anyone other than the Buyer. Any model or sample furnished to Buyer is merely illustrative of the general type and quality of goods and does not represent that any Product will conform to such model or sample.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, ARE GRANTED INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR NON-INFRINGEMENT. BUYER'S EXCLUSIVE REMEDY FOR NON-CONFORMING PRODUCTS DURING THE WARRANTY PERIOD IS LIMITED TO REPAIR, REPLACEMENT OR REFUND FOR THE NON-CONFORMING PRODUCT. THERE IS NO OBLIGATION TO REPAIR, REPLACE OR REFUND FOR PRODUCTS AS THE RESULT OF (I) ACCIDENT, DAMAGE OR EVENT OF FORCE MAJEURE, (II) MISUSE, FAULT OR NEGLIGENCE OF OR BY BUYER, (III) USE OF THE PRODUCTS IN A MANNER FOR WHICH THEY WERE NOT DESIGNED, OR (IV) IMPROPER STORAGE AND HANDLING OF THE PRODUCTS. Unless otherwise expressly stated on the Product or in the documentation accompanying the Product, the Product is intended for research only and is not for diagnostic uses, in vivo diagnostic uses, ex vivo or in vitro therapeutic uses, or any type of consumption by or application to humans or animals.

Thermo Fisher Scientific
3747 N. Meridian Road
Rockford, IL 61105 USA

thermofisher.com/contactus
40-4700 was used in Immunocytochemistry-immunofluorescence to display STEC infections in the VDC system and subsequently analyse STEC pathogenesis.

Human / 1:20
Methods in molecular biology (Clifton, N.J.) (Apr 2021; 2291: 273)
"Determining Shiga Toxin-Producing Escherichia coli Interactions with Human Intestinal Epithelium in a Microaerobic Vertical Diffusion Chamber."
Author(s):McGrath CJ, Schüller S
PubMed Article URL:http://dx.doi.org/10.1007/978-1-0716-1339-9_12

40-4700 was used in Immunocytochemistry to investigate if food-relevant synthetic amorphous silica elicit acute toxicity responses in intestinal epithelial cells.

Human / 1:100
Toxicology in vitro : an international journal published in association with BIBRA (Sep 2020; 67: )
"The impact of synthetic amorphous silica (E 551) on differentiated Caco-2 cells, a model for the human intestinal epithelium."
PubMed Article URL:http://dx.doi.org/10.1016/j.tiv.2020.104903

40-4700 was used in immunocytochemistry and western blot to determine if mast cells regulate airway epithelial integrity using a P. aeruginosa lung infection mouse model.

Mouse / Not Cited
The American journal of pathology (Aug 2014; 184: 2310)
"Mast cells protect against Pseudomonas aeruginosa-induced lung injury."
Author(s): Junkins RD, Carrigan SO, Wu Z, Stadnyk AW, Cowley E, Issekutz T, Berman J, Lin TJ
PubMed Article URL:http://dx.doi.org/10.1016/j.ajpath.2014.05.009

3 Immunohistochemistry (Paraffin) References

Species / Dilution | Summary
--- | ---
**Human** / 1:20 | 40-4700 was used in Immunohistochemistry (Paraffin) to reveal the preventative effect of TGF-1 in hypospadias induced by DEHP via the reduction of EMT.

**Human** / 1:100 | 40-4700 was used in Immunohistochemistry (Paraffin) to study phenotypic plasticity in triple-negative breast cancer.

**Mouse** / Not Cited | 40-4700 was used in immunohistochemistry - paraffin section and western blot to elucidate how particulate matter impairs male reproduction.

**Species** / **Dilution**

**Rat** / 1:250 | Pediatric research (Mar 2020; 87: 639)
"TGF-1 relieves epithelial-mesenchymal transition reduction in hypospadias induced by DEHP in rats."
PubMed Article URL:http://dx.doi.org/10.1038/s41390-019-0622-2

**Species** / **Dilution**

**Rat** / 1:150 | Toxicology letters (Jan 2017; 266: 1)
"Urban fine particulate matter exposure causes male reproductive injury through destroying blood-testis barrier (BTB) integrity."
PubMed Article URL:http://dx.doi.org/10.1016/j.toxlet.2016.12.004

2 Miscellaneous PubMed References

**Species** / **Dilution**

**Human** / Not Cited | 40-4700 was used in western blot to use a novel cell-based model system to study phenotypic plasticity in triple-negative breast cancer.

**Species** / **Dilution**

**Human** / Not Cited | "Evidence for phenotypic plasticity in aggressive triple-negative breast cancer: human biology is recapitulated by a novel model system."
Author(s): D’Amato NC, Ostrander JH, Bowie ML, Sistrunk C, Borowsky A, Cardiff RD, Bell K, Young LJ, Simin K, Bachelder RE, Delrow J, Dawson A, Yee LD, Mrózek K, Clay TM, Osada T, Seewaldt VL
PubMed Article URL:http://dx.doi.org/10.1371/journal.pone.0045684


Products are warranted to operate or perform substantially in conformance with published Product specifications in effect at the time of sale, as set forth in the Product documentation, specifications and/or accompanying package inserts (“Documentation”). Our claim of suitability for use in applications regulated by FDA is limited to one year from date of shipment when the Product is subjected to normal proper and intended usage. This warranty does not extend to anyone other than the Buyer. Any model or sample furnished to Buyer is merely illustrative of the general type and quality of goods and does not represent that any Product will conform to such model or sample.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, ARE GRANTED INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR NON INFRINGEMENT. SELLER’S EXCLUSIVE REMEDY FOR NON-COMFORMING PRODUCTS DURING THE WARRANTY PERIOD IS REPAIR, REPLACEMENT OR RE-REFUND FOR THE NON-COMFORMING PRODUCTS AT SELLER’S SOLE OPTION. THERE IS NO REPLACEMENT, REPLACEMENT OF OR REFUND FOR PRODUCTS AS THE RESULT OF (I) ACCIDENT, DISASTER OR EVENT OF FORCE MAJEURE, (II) MISUSE, FAULT OR NEGLIGENCE OF OR BY BUYER, (III) USE OF THE PRODUCTS IN A MANNER FOR WHICH THEY WERE NOT DESIGNED, OR (IV) IMPROPER ... STATED ON THE PRODUCT OR IN THE DOCUMENTATION ACCOMPANYING THE PRODUCT, THE PRODUCT IS INTENDED FOR RESEARCH ONLY AND IS NOT TO BE USED FOR ANY OTHER PURPOSE, INCLUDING WITHOUT LIMITATION, UNAUTHENTICATED COMMERCIAL USES, IN VITRO DIAGNOSTIC USES, IN VIVO OR IN VIVO THERAPEUTIC USES, OR ANY TYPE OF CONSUMPTION OR APPLICATION TO HUMAN OR ANIMALS.
40-4700 was used in immunocytochemistry to characterize an in vitro human outer blood-retinal barrier model

Methods in molecular biology (Clifton, N.J.) (Jun 2011; 686: 401)
"Isolation and properties of an in vitro human outer blood-retinal barrier model."
Author(s): Hamilton RD, Leach L
PubMed Article URL: http://dx.doi.org/10.1007/978-1-60761-938-3_20