Claudin 1 Polyclonal Antibody
Catalog Number  51-9000

Details

<table>
<thead>
<tr>
<th>Size</th>
<th>100 µg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host/Isotope</td>
<td>Rabbit / IgG</td>
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<tr>
<td>Class</td>
<td>Polyclonal</td>
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<tr>
<td>Type</td>
<td>Antibody</td>
</tr>
<tr>
<td>Immunogen</td>
<td>Synthetic peptide derived from the C-terminus of the human Claudin-1 protein</td>
</tr>
<tr>
<td>Conjugate</td>
<td>Unconjugated</td>
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<tr>
<td>Form</td>
<td>Liquid</td>
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<tr>
<td>Concentration</td>
<td>0.25 mg/mL</td>
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<td>Purification</td>
<td>Antigen affinity chromatography</td>
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<tr>
<td>Storage buffer</td>
<td>PBS, pH 7.4</td>
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<tr>
<td>Contains</td>
<td>0.1% sodium azide</td>
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<td>Storage Conditions</td>
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Species Reactivity

<table>
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<tr>
<th>Species reactivity</th>
<th>Chicken, Human, Rat</th>
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<tr>
<td>Published species</td>
<td>Tag, Pig, Rat, Non-human primate, Virus, Amphibian, Bovine, Sheep, Human, Mouse, Chicken, Not Applicable, Dog, C. elegans</td>
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Tested Applications

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<tr>
<td>ELISA (ELISA)</td>
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<tr>
<td>Immunohistochemistry (Paraffin) (IHC (P))</td>
</tr>
<tr>
<td>Western Blot (WB)</td>
</tr>
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</table>

Published Applications

<table>
<thead>
<tr>
<th>Western Blot (WB)</th>
<th>See 82 publications below</th>
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<tr>
<td>Immunohistochemistry (IHC)</td>
<td>See 35 publications below</td>
</tr>
<tr>
<td>Immunocytochemistry (ICC/IF)</td>
<td>See 55 publications below</td>
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<tr>
<td>ELISA (ELISA)</td>
<td>See 1 publications below</td>
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<tr>
<td>Miscellaneous PubMed (Misc)</td>
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<tr>
<td>Immunohistochemistry (Paraffin) (IHC (P))</td>
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<td>Immunohistochemistry (Frozen) (IHC (F))</td>
<td>See 7 publications below</td>
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<tr>
<td>Immunoprecipitation (IP)</td>
<td>See 6 publications below</td>
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* 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.

Background/Target Information

Claudin-1 is a member of the transmembrane protein family claudins located in cell-cell tight junctions and it acts as a co-receptor for HCV entry into hepatic cells. Claudins are abundant in luminal epithelial sheets where they maintain epithelial cell polarity. Claudin-1 is expressed in most tissues such as bladder, fallopian tube, liver, pancreas, prostate, and skin.

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Claudin 1 Antibody (51-9000) in IHC (P)
Immunohistochemistry analysis of Claudin-1 showing staining in the cytoplasm and membrane of paraffin-embedded human skin 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 Claudin-1 Rabbit Polyclonal Antibody (Product # 51-9000) diluted in 3% BSA-PBS at a dilution of 1:100 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.

Claudin 1 Antibody (51-9000)
Antibody specificity was demonstrated by CRISPR-Cas9 mediated knockout of target protein. A loss of signal was observed for target protein in CLDN1 KO cell line compared to control cell line using Anti-Claudin 1 Polyclonal Antibody (Product # 51-9000). (KO)

Claudin 1 Antibody (51-9000) in IHC (P)
Immunohistochemistry analysis of Claudin-1 showing staining in the membrane of paraffin-embedded human colon carcinoma (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 Claudin-1 Rabbit Polyclonal Antibody (Product # 51-9000) 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.

Claudin 1 Antibody (51-9000)
Altered expression of proteins upon cell treatment demonstrates antibody specificity. Western blot using Anti-Claudin 1 Polyclonal Antibody (Product # 51-9000), shows increased expression of CLDN1 in Caco-2 cell line upon EGF with LiCl and IL-beta treatment and A549 treated with TGF- with TNF treatment. (TM)
Claudin 1 Antibody (51-9000) in IHC
Immunohistochemical staining of human skin tissue using Rabbit anti-Claudin-1 Polyclonal Antibody (PAD: JAY.8). (Product # 51-9000).

Claudin 1 Antibody (51-9000) in WB
Knockout of CLDN1 was achieved by CRISPR-Cas9 genome editing using LentiArray™ Lentiviral sgRNA (Product # A32042, Assay ID CRIPSR9851665, LV) and LentiArray Cas9 Lentivirus (Product # A32064). Western blot analysis of CLDN1 was performed by loading 30 µg of Caco-2 Wild type (Lane 1), Caco-2 Wild type treated with 100 ng/mL EGF and 50mM LiCl for 24hrs (Lane 2), Caco-2 Cas9 (Lane 3), Caco-2 Cas9 treated with 100 ng/mL EGF and 50mM LiCl for 24hrs (Lane 4), Caco-2 CLDN1 KO (Lane 5) and Caco-2 CLDN1 KO treated with 100 ng/mL EGF and 50mM LiCl for 24hrs (Lane 6) 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-Claudin 1 Polyclonal Antibody (Product # 51-9000, 0.25 µg/mL dilution) and Goat anti-Rabbit IgG (H+L) Superclonal™ Recombinant Secondary Antibody, HRP (Product # A27036, 1:5000 dilution) using the iBright FL 1000 (Product # A32752). 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 CLDN1.

Claudin 1 Antibody (51-9000) in WB
Western blot was performed using Anti-Claudin1 Polyclonal Antibody (Product # 51-9000) and a 22 kDa band corresponding to CLDN1 was observed across cell lines tested and increased upon EGF with LiCl and IL-beta treatment. Membrane enriched extracts (30 µg lysate) of Caco-2 (Lane 1), Caco-2 treated with EGF (100 ng/mL) and LiCl (50 mM) simultaneously for 24 Hours (Lane 2), Caco-2 treated with IL-beta (10 ng/mL) for 48 Hours (Lane 3) and 25 µg lysate of A549 (Lane 4) and A549 treated with TGF-β (10 ng/mL) & TNF (20 ng/mL) simultaneously for 72 hr were electrophoresed using Novex® NuPAGE® 12 % Bis-Tris gel (Product # NP0342BOX). 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 (0.25 µg/mL) and detected by chemiluminescence using Goat anti-Rabbit IgG (H+L), Superclonal™ Recombinant Secondary Antibody, HRP (Product # A27036, 1:4,000 dilution) using the iBright FL 1000 (Product # A32752). Chemiluminescent detection was performed using Novex® ECL Chemiluminescent Substrate Reagent Kit (Product # WP20005).
## PubMed References For Claudin 1 Polyclonal Antibody

### 82 Western Blot References

<table>
<thead>
<tr>
<th>Species / Dilution</th>
<th>Summary</th>
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<tr>
<td>Human / Not Cited</td>
<td>51-9000 was used in Immunocytochemistry-immunofluorescence to reveal that the transmission Kaposi's sarcoma-associated herpesvirus (KSHV) infection, which is promoted by the exosomes in the saliva of people living with human immunodeficiency virus (HIV), can reduced by the inhibition of epidermal growth factor receptor (EGFR).</td>
</tr>
<tr>
<td>Human / 1 µg/ml Mouse / 1 µg/ml</td>
<td>Inducible expression of Snail selectively increases paracellular ion permeability and differentially modulates tight junction proteins.</td>
</tr>
<tr>
<td>Pig / Not Cited</td>
<td>51-9000 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.</td>
</tr>
<tr>
<td>Mouse / 1:3000</td>
<td>Not Applicable / Not Cited</td>
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<tr>
<td>Human / 1:1000</td>
<td>51-9000 was used in Western Blotting to address the need for a cell line that faithfully recapitulates primary human keratinocytes with regard to cellular differentiation, barrier formation, and tight junction organization.</td>
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<tr>
<td>Human / 1:250</td>
<td>51-9000 was used in Western blot to identify targets of miR-375 and characterize its function in non-small-cell lung cancer.</td>
</tr>
<tr>
<td>Dog / Not Cited</td>
<td>&quot;Tight junctional localization of claudin-16 is regulated by syntaxin 8 in renal tubular epithelial cells.&quot;</td>
</tr>
<tr>
<td>Rat / Not Cited</td>
<td>&quot;Claudin-1 is a novel target of miR-375 in non-small-cell lung cancer.&quot;</td>
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<tr>
<th>Source Type</th>
<th>Abstract/Title</th>
<th>PubMed Article URL</th>
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<tr>
<td>Human / Not Cited</td>
<td>51-9000 was used in Western Blot to show that enhancement in FDPS level is observed in glioma tissues and associate with poor prognosis, contributed to tumour growth.</td>
<td><a href="http://dx.doi.org/10.1011/ajpcell.00267.2002">PubMed Article URL</a></td>
<td><a href="https://www.thermofisher.com/contactus">Author(s)</a> Chen Z, Chen G, Zhao H</td>
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<td>51-9000 was used in Western Blot to investigate the antioxidant effects of red-osier dogwood extracts (RDE) on an oxidative damage model of Caco-2 cells.</td>
<td><a href="http://dx.doi.org/10.1038/a0800250">PubMed Article URL</a></td>
<td><a href="https://www.thermofisher.com/contactus">Author(s)</a> Yang R, Hui Q, Jiang Q, Liu S, Zhang H, Wu J, Lin F, O K, Yang C</td>
</tr>
<tr>
<td>Human / Not Cited</td>
<td>51-9000 was used in Western Blot to suggest that butyrate is the main component of SCFAs to alleviate barrier dysfunction and that claudin-2 is the major target of this SCFA.</td>
<td><a href="http://dx.doi.org/10.1270/biomedresearch20190250">PubMed Article URL</a></td>
<td><a href="https://www.thermofisher.com/contactus">Author(s)</a> Huang X, Oshima T, Tomita T, Fukui H, Miwa H</td>
</tr>
<tr>
<td>Mouse / 1:500</td>
<td>51-9000 was used in Immunohistochemistry-immunofluorescence to report on the development of a nanoparticle (C1C2-NP) that targets regions of increased claudin-1 expression that reduces BBB integrity.</td>
<td><a href="http://dx.doi.org/10.3390/biology10030205">PubMed Article URL</a></td>
<td><a href="https://www.thermofisher.com/contactus">Author(s)</a> Bony BA, Tarudji AW, Miller HA, Gowrikumar S, Roy S, Curtis ET, Gee CC, Vecchio A, Dhawan P, Kleveland FM</td>
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51-9000 was used in Immunohistochemistry to indicate that HDAC inhibitors suppress the proliferation, migration, and invasiveness of HNSCC by downregulating the p63-mediated tight junction molecules JAM-A and claudin-1, and inducing p63 or p21-mediated growth arrest.

**Human / 1:1000**

Oncology reports (Apr 2021; 45: )

"HDAC inhibitors suppress the proliferation, migration and invasiveness of human head and neck squamous cell carcinoma cells via p63-mediated tight junction molecules and p21-mediated growth arrest."


PubMed Article URL:http://dx.doi.org/10.3892/or.2021.7997

51-9000 was used in western blot to examine what proteins are produced when carbohydrate-fed healthy humans receive enteral delivery of proteins.

**Human / Not Cited**


"Enteral delivery of proteins enhances the expression of proteins involved in the cytoskeleton and protein biosynthesis in human duodenal mucosa."

Author(s):Goichon A,Bertrand J,Chan P,Leclère S,Couillard A,Cailleux AF,Vaudry D,Dechelotte P,Coëffier M

PubMed Article URL:http://dx.doi.org/10.3945/ajcn.114.104216

51-9000 was used in Western Blotting to determine whether ZIKV can open the paracellular pathway of STB cells which have been seen to be resistant to ZIKV infections.

**Mouse / 1:250**

"Extracellular signal-regulated kinases 1/2 control Claudin-2 expression in Madin-Darby canine kidney strain I and II cells."

Author(s):Lipschutz JH,Li S,Arisco A,Balkovetz DF

PubMed Article URL:http://dx.doi.org/10.1074/jbc.M408122200

51-9000 was used in Western Blotting to elucidate the molecular mechanisms behind altered claudin-3 expression during colorectal tumorigenesis.

**Human / 1:1000**

Cells (Sep 2019; 8: )

"Syncytiotrophoblast of Placentae from Women with Zika Virus Infection Has Altered Tight Junction Expression and Increased Paracellular Permeability."


PubMed Article URL:http://dx.doi.org/10.3390/cells8101174

51-9000 was used in Western Blotting to evaluate the retinas of transgenic APPSWE/PS1E9 mouse models of AD (ADtg mice) and wild-type mice at different ages for capillary degeneration, PDGFR expression, vascular amyloidosis, permeability and inner BRB-tight junction molecules.

**Mouse / 1:75**

Acta neuropathologica communications (Nov 2020; 8: )

"Retinal capillary degeneration and blood-retinal barrier disruption in murine models of Alzheimer's disease."

Author(s):Shi H,Koronyo Y,Fuchs DT,Sheyn J,Wawrowesky K,Lahiri S,Black KL,Koronyo-Hamaoui M

PubMed Article URL:http://dx.doi.org/10.1186/s40478-020-01076-4

51-9000 was used in Western Blotting to reveal reciprocal regulation between ZO-1 and cell mechanics controls tight junction assembly and epithelial morphogenesis, and that, in a second, tension-independent step, ZO-1 is required to assemble morphologically and structurally fully assembled and functionally normal tight junctions.

**Human / 1:500**

PloS one (Jun 2014; 8: )

"Claudin-3 overexpression increases the malignant potential of colorectal cancer cells: roles of ERK1/2 and PI3K-Akt as modulators of EGFR signaling."

Author(s):de Souza WF,Fortunato-Miranda N,Robbs BK,de Araujo WM,de Freitas-Junior JC,Bastos LG,Viola JP,Morgado-Dias JA

PubMed Article URL:http://dx.doi.org/10.1371/journal.pone.0074994

51-9000 was used in Immunohistochemistry to indicate that HDAC inhibitors suppress the proliferation, migration and invasiveness of human head and neck squamous cell carcinoma cells via p63-mediated tight junction molecules and p21-mediated growth arrest.

**Dog / Not Cited**

Cells (Nov 2022; 11: )

"ZO-1 Guides Tight Junction Assembly and Epithelial Morphogenesis via Cytoskeletal Tension-Dependent and - Independent Functions."

Author(s):Haas MJ,Žihić C,Krug SM,Maraspini R,Onati T,Furuse M,Honigmann A,Balda MS,Matter K

PubMed Article URL:http://dx.doi.org/10.3390/cells11233775
51-9000 was used in Western Blot to examine cell motility using micropatterned free edge migration model with E-cadherin re-expressing EC96 cells derived from adenocarcinoma gastric (AGS) cell line.

Human / 1:1000
Bioengineering (Basel, Switzerland) (May 2021; 8:)
"Expression of E-Cadherin in Epithelial Cancer Cells Increases Cell Motility and Directionality through the Localization of ZO-1 during Collective Cell Migration."
Author(s): Park SY, Jang H, Kim SY, Kim D, Park Y, Kee SH
PubMed Article URL: http://dx.doi.org/10.3390/bioengineering8050065

51-9000 was used in Western Blot to provide new insights into a function role of quercetin in maintaining intestinal homeostasis.

Pig / 1:2000
Nutrients (Jan 2021; 13:)
"Quercetin Alleviates Oxidative Damage by Activating Nuclear Factor Erythroid 2-Related Factor 2 Signaling in Porcine Enteroctyes."
Author(s): Ji H, Zhang Y, Si X, Jin Y, Jiang D, Dai Z, Wu Z
PubMed Article URL: http://dx.doi.org/10.3390/nu13020375

51-9000 was used in Western Blotting to report that asparagine increases intestinal barrier dysfunction induced by LPS stress, and regulates CRF/CRFR1 signaling pathway and mast cell activation.

Pig / 1:1000
Innate immunity (Aug 2017; 23: 546)
"Asparagine preserves intestinal barrier function from LPS-induced injury and regulates CRF/CRFR signaling pathway."
PubMed Article URL: http://dx.doi.org/10.1177/1753425917721631

519000 was used in western blot to study the role of TLR4 in irinotecan-induced diarrhea

Mouse / 1:50
Molecular cancer therapeutics (Nov 2016; 15: 2767)
"TLR4-Dependent Claudin-1 Internalization and Secretagogue-Mediated Chloride Secretion Regulate Irinotecan-Induced Diarrhea."
Author(s): Wardill HR, Bowen JM, Van Sebille YZ, Secombe KR, Collier JK, Ball IA, Logan RM, Gibson RJ
PubMed Article URL: http://dx.doi.org/10.1158/1535-7163.MCT-16-0330

51-9000 was used in Western Blotting to show that CLDN-1 positively and negatively influences Clostridium perfringens enterotoxin (CPE) action.

Human / Not Cited
Toxins (Oct 2019; 11:)
"Effects of Claudin-1 on the Action of Clostridium perfringens Enterotoxin in Caco-2 Cells."
Author(s): Mehdizadeh Gohari I, Li J, Navarro M, Uzal F, McClane B
PubMed Article URL: http://dx.doi.org/10.3390/toxins1100582

51-9000 was used in western blot to investigate the mechanisms of hepatitis C virus entry into multiple permissive human hepatocyte-derived cells

Human / Not Cited
The Journal of general virology (Dec 2014; 95:)
"Alternative endocytosis pathway for productive entry of hepatitis C virus."
PubMed Article URL: http://dx.doi.org/10.1099/vir.0.068528-0

PubMed Article URL: http://dx.doi.org/10.3390/nu13020375

PubMed Article URL: http://dx.doi.org/10.1099/vir.0.068528-0

The Journal of general virology (Dec 2014; 95: 2658)
"Alternative endocytosis pathway for productive entry of hepatitis C virus."
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PubMed Article URL: http://dx.doi.org/10.1099/vir.0.068528-0

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Pig / Not Cited
“Tumor Necrosis Factor Alpha Effects on the Porcine Intestinal Epithelial Barrier Include Enhanced Expression of TNF Receptor 1.”
Author(s):Droessler L,Cornelius V,Markov AG,Amasheh S
PubMed Article URL:http://dx.doi.org/10.3390/ijms22168746

Human / 1:1000
Archives of dermatological research (Mar 2014; 306: 131)
“p38 mitogen-activated protein kinase regulates the expression of tight junction protein ZO-1 in differentiating human epidermal keratinocytes.”
Author(s):Siljamäki E,Raiko L,Toriseva M,Nissinen L,Näreoja T,Peltonen J,Kääriä VM,Peltonen S
PubMed Article URL:http://dx.doi.org/10.1007/s00403-013-1391-0

Human / Not Cited
Gastroenterology (Aug 2002; 123: 433)
“Mechanisms of diarrhea in collagenous colitis.”
Author(s):Bürgel N,Bojarski C,Mankertz J,Zeitz M,Fromm M,Schulzke JD
PubMed Article URL:http://dx.doi.org/10.1053/gast.2002.34784

Human / 1:1000
Journal of neuroinflammation (Mar 2021; 18: )
“The psychoactive drug of abuse mephedrone differentially disrupts blood-brain barrier properties.”
Author(s):Buzhdygan TP,Rodrigues CR,McGary HM,Khan JA,Andrews AM,Rawls SM,Ramirez SH
PubMed Article URL:http://dx.doi.org/10.1186/s12974-021-02116-z

Mouse / Not Cited
The Journal of biological chemistry (Jan 2003; 278: 2692)
“The tight junction protein ZO-2 localizes to the nucleus and interacts with the heterogeneous nuclear ribonucleoprotein scaffold attachment factor-B.”
Author(s):Traweger A,Fuchs R,Krizbai IA,Weiger TM,Bauer HG,Bauer H
PubMed Article URL:http://dx.doi.org/10.1074/jbc.M206821200

Human / 1:1000
The Journal of clinical investigation (Sep 2021; 131: )
“Marveld3 Is Upregulated in Ulcerative Colitis and Has Attenuating Effects during Colitis Indirectly Stabilizing the Intestinal Barrier.”
PubMed Article URL:http://dx.doi.org/10.3390/cells11091541

Mouse / Not Cited
Cells (May 2022; 11: )
“MarvelD3 Is Upregulated in Ultraviolet Radiation-Induced DNA Damage.”
PubMed Article URL:http://dx.doi.org/10.1186/s12974-021-02116-z

Human / Not Cited
The Journal of clinical investigation (Sep 2021; 131: )
“T cell protein tyrosine phosphatase protects intestinal barrier function by restricting epithelial tight junction remodeling.”
PubMed Article URL:http://dx.doi.org/10.1172/JCI138230

Human / 1:1000
Journal of cellular physiology (Sep 2020; 235: 6127)
“Testin regulates the blood-testis barrier via disturbing occludin/ZO-1 association and actin organization.”
PubMed Article URL:http://dx.doi.org/10.1002/jcp.29541


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519000 was used in western blot to develop an unbiased, quantitative, and high-throughput method to measure changes in protein expression and locations in different colorectal cancer cell lines.

Proteomics (Dec 2016; 16: 3009)
"Subcellular proteomics analysis of different stages of colorectal cancer cell lines."
Author(s): Mathieu AA, Ohi-Séguy E, Dubois ML, Jean D, Jones C, Boudreau F, Boisvert FM
PubMed Article URL: http://dx.doi.org/10.1002/pmic.201600314

51-9000 was used in western blot to investigate neoplastic transformation of telomerase in immortalized human fibroblasts.

Human / Not Cited
International journal of oncology (Nov 2011; 39: 1199)
"Relocalization of cell adhesion molecules during neoplastic transformation of human fibroblasts."
Author(s): Belgiovinne C, Chiodi I, Mondello C
PubMed Article URL: http://dx.doi.org/10.3892/ijo.2011.1119

51-9000 was used in Western Blotting to investigate the presence of necroptosis in intestinal injury, and its contribution to intestinal injury in a piglet model challenged with Escherichia coli lipopolysaccharide (LPS).

Pig / Not Cited
Cell death & disease (Jan 2021; 12: )
"Necroptosis is active and contributes to intestinal injury in a piglet model with lipopolysaccharide challenge."
PubMed Article URL: http://dx.doi.org/10.1038/s44149-020-03365-1

51-9000 was used in Western Blotting to demonstrate that the choice of culture media impacts the biological response of KC in a manner that persists through differentiation in the same media..

Mouse / Not Cited
American Journal of Physiology. Gastrointestinal and Liver Physiology (Apr 2011; 300: G586)
"Loss of Smad5 leads to the disassembly of the apical junctional complex and increased susceptibility to experimental colitis."
Author(s): Alleire JM, Darsigny M, Marcoux SS, Roy SA, Schmuth JF, Umans L, Zwijnsen A, Boudreau F, Perreault N
PubMed Article URL: http://dx.doi.org/10.1152/ajpgi.00041.2010

51-9000 was used in Immunocytochemistry-immunofluorescence to investigate the role of human papillomavirus (HPV) 16 E7 oncoprotein on the sealing of TJs, and also the expression level of claudins in mouse cervix and in epithelial Madin-Darby Canine Kidney (MDCK) cells.

Dog / Not Cited
International journal of oncology (Oct 2020; 57: 905)
"E7 oncoprotein from human papillomavirus 16 alters claudins expression and the sealing of epithelial tight junctions."
PubMed Article URL: http://dx.doi.org/10.3892/ijo.2020.5105

51-9000 was used in western blot to test if fish oil modulates intestinal barrier function and corticotropin-releasing hormone signaling pathways.

Bird / 1:500
The British journal of nutrition (Jun 2016; 115: 1947)
"Fish oil enhances intestinal barrier function and inhibits corticotropin-releasing hormone receptor 1 signalling pathway in weaned pigs after lipopolysaccharide challenge."
PubMed Article URL: http://dx.doi.org/10.1017/s0007114516001100

519000 was used in western blot to test if fish oil modifies intestinal barrier function and corticotropin-releasing hormone signaling pathways.

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1. **American Journal of Physiology. Gastrointestinal and liver physiology** (Jan 2019; 316: G1)

"Enhanced gastrointestinal passive paracellular permeability contributes to obesity-associated hyperoxaluria by increasing passive paracellular intestinal oxalate absorption.


PubMed Article URL: http://dx.doi.org/10.1152/ajpgi.00266.2018

2. **Journal of animal physiology and animal nutrition** (Mar 2001; 280: H1241)

"Inflammatory pain alters blood-brain barrier permeability and tight junctional protein expression."

Author(s): Huber JD, Witt KA, Hom S, Egerton RD, Mark KS, Davis TP


"Inflammatory pain alters blood-brain barrier permeability and tight junctional protein expression."

Author(s): Huber JD, Witt KA, Hom S, Egerton RD, Mark KS, Davis TP


"Role of Claudin interactions in airway tight junctional permeability."

Author(s): Coyne CB, Gambling TM, Boucher RC, Carson J-L, Johnson LG

PubMed Article URL: http://dx.doi.org/10.1152/ajplung.00182.2003

5. **Journal of investigative dermatology** (Jun 2003; 105: 586)

"Localization of Claudin-3 in tight junctions of the blood-brain barrier is selectively lost during experimental autoimmune encephalomyelitis and human glioblastoma multiforme."


PubMed Article URL: http://dx.doi.org/10.1007/s00401-003-0688-z


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Author(s): Coyne CB, Gambling TM, Boucher RC, Carson J-L, Johnson LG

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Author(s): Huber JD, Witt KA, Hom S, Egerton RD, Mark KS, Davis TP


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PubMed Article URL: http://dx.doi.org/10.1152/ajplung.00182.2003

17. **Journal of investigative dermatology** (Jun 2003; 105: 586)

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PubMed Article URL: http://dx.doi.org/10.1007/s00401-003-0688-z


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PubMed Article URL: http://dx.doi.org/10.1007/s00401-003-0688-z


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PubMed Article URL: http://dx.doi.org/10.1007/s00401-003-0688-z


"Localization of Claudin-3 in tight junctions of the blood-brain barrier is selectively lost during experimental autoimmune encephalomyelitis and human glioblastoma multiforme."


PubMed Article URL: http://dx.doi.org/10.1007/s00401-003-0688-z
51-9000 was used in western blot to study changes in the blood retinal barrier in diabetic macular edema.

**Human / 2 µg/mL**

**Pepites (Jan 2013; 39; 119)**

"Ameliorative effect of PACAP and VIP against increased permeability in a model of outer blood retinal barrier dysfunction."

Author(s): Scuderi S, D’Amico AG, Castorina A, Imbesi R, Carnazza ML, D’Agata V

PubMed Article URL: http://dx.doi.org/10.1016/j.peptides.2012.11.015

**Human / Not Cited**

American journal of physiology. Cell physiology (Nov 2004; 287: C1412)

"Ochratoxin A increases permeability through tight junctions by removal of specific claudin isoforms."

Author(s): McLaughlin J, Padfield PJ, Burt JP, O’Neill CA

PubMed Article URL: http://dx.doi.org/10.1152/ajpcell.00007.2004

**Human / 1:1000**

51-9000 was used in Western Blotting to determine if JAK inhibition by tofacitinib can rescue cytokine-induced barrier dysfunction in intestinal epithelial cells (IECs).

**Rat / Not Cited**

"Chronic inflammatory pain leads to increased blood-brain barrier permeability and tight junction protein alterations."

Author(s): Brooks TA, Hawkins BT, Huber JD, Egleton RD, Davis TP

PubMed Article URL: http://dx.doi.org/10.1152/ajpheart.01288.2004

**Human / Not Cited**

51-9000 was used in Western Blotting to determine if JAK inhibition by tofacitinib can rescue cytokine-induced barrier dysfunction in intestinal epithelial cells (IECs).

**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, Zakrzewski SS, Günzel D, Schulzke JD, Van Kessel AG

PubMed Article URL: http://dx.doi.org/10.1079/bjn.2013.3266

**Human / Not Cited**

The Journal of biological chemistry (Feb 2002; 277: 4247)

"Protein kinase C signaling regulates ZO-1 translocation and increased paracellular flux of T84 colonocytes exposed to Clostridium difficile toxin A."

Author(s): Chen ML, Pothoulakis C, LaMont JT

PubMed Article URL: http://dx.doi.org/10.1074/jbc.M109254200

**Mouse / Not Cited**


"Cyclooxygenase-2 deficiency leads to intestinal barrier dysfunction and increased mortality during polymicrobial sepsis."

Author(s): Freedrenburgh LE, Velandia MM, Ma J, Olszak T, Cernadas M, Englert JA, Chung SW, Liu X, Begay C, Padera RF, Blumberg RS, Walsh SR, Baron RM, Perrella MA

PubMed Article URL: http://dx.doi.org/10.4049/jimmunol.1101186

**Mouse / Not Cited**

American journal of physiology. Renal physiology (Dec 2003; 285: F1078)

"Reversal of charge selectivity in cation or anion-selective epithelial lines by expression of different claudins." 

Author(s): Van Itallie CM, Fanning AS, Anderson JM

PubMed Article URL: http://dx.doi.org/10.1152/ajprenal.00116.2003

**Mouse / Not Cited**

The Journal of clinical investigation (Jul 2019; 129: 3224)

"Epithelial HIF-1α axis regulates barrier dysfunction in eosinophilic esophagitis."

Author(s): Masterson JC, Biette KA, Hammer JA, Nguyen N, Capocelli KE, Saeedi BJ, Harris RF, Fernando SD, Hosford LB, Kelly CJ, Campbell EL, Etherton SF, Ahmed FN, Nakagawa H, Lee JJ, McMahan EE, Glover LE, Colgan SP, Furuta GT

PubMed Article URL: http://dx.doi.org/10.1172/JCI126744

**Non-human primate / Not Cited**

American journal of physiology. Cell physiology (Jun 2005; 288: C1231)

"Knockdown of occludin expression leads to diverse phenotypic alterations in epithelial cells."

Author(s): Yu AS, McCarthy KM, Francis SA, McCormack JM, Lai J, Rogers RA, Lynch RD, Schneeberger EE

PubMed Article URL: http://dx.doi.org/10.1152/ajpcell.00581.2004

**Mouse / Not Cited**


"Chronic inflammatory pain leads to increased blood-brain barrier permeability and tight junction protein alterations."

Author(s): McLaughlin J, Padfield PJ, Burt JP, O’Neill CA

PubMed Article URL: http://dx.doi.org/10.1152/ajpheart.01288.2004


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Clinical cancer research: an official journal of the American Association for Cancer Research (Jul 2003; 9: 2567)
"Tight junction proteins claudin-3 and claudin-4 are frequently overexpressed in ovarian cancer but not in ovarian cystadenomas."

Human / 1:200

51-9000 was used in Western Blotting to conclude that several days after the addition of VEGF-A165 to iBREC, barrier dysfunction is mainly sustained by increased paracellular flow and impaired adhesion.

Bovine / Not Cited

51-9000 was used in Western Blot to show that spermine protects intestinal barrier integrity through ras-related C3 botulinum toxin substrate 1 (Rac1)/ phospholipase C-1PLC-1 signaling pathway in piglets.

Dog / Not Cited

51-9000 was used in Western Blot to demonstrate that high MUC2 output during colitis impairs goblet cell migration and wound healing by reducing production of growth factors critical in wound repair.

Human / Not Cited

51-9000 was used in Western Blot to show that spermine protects intestinal barrier integrity through ras-related C3 botulinum toxin substrate 1/phospholipase C-1 signaling pathway in piglets.

Pig / 1:100

Animal nutrition (Zhongguo xu mu shou yi xue hui) (Mar 2022; 8: 135)
"Spermine protects intestinal barrier integrity through ras-related C3 botulinum toxin substrate 1/phospholipase C-1 signaling pathway in piglets."
PubMed Article URL: http://dx.doi.org/10.1016/j.aninu.2021.06.016

Human / Not Cited

The American journal of pathology (Sep 2018; 188: 2025)
"High MUC2 Mucin Biosynthesis in Goblet Cells Impedes Restitution and Wound Healing by Elevating Endoplasmic Reticulum Stress and Altered Production of Growth Factors."
Author(s): Tawiah A, Moreau F, Kumar M, Tiwari S, Falguera J, Chadee K
PubMed Article URL: http://dx.doi.org/10.1016/j.ajpather.2018.05.013

Human / Not Cited

The Journal of biological chemistry (Jan 2004; 279: 2567)
"Desmosomes polarize and integrate chemical and mechanical signaling to govern epidermal tissue form and function."
Author(s): Broussard JA, Koetsier JL, Hegazy M, Green KJ
PubMed Article URL: http://dx.doi.org/10.1016/j.jbc.2003.12.029

Human / Not Cited

Investigative ophthalmology & visual science (Jun 2012; 53: 5016)
"Effects of proinflammatory cytokines on the claudin-19 rich tight junctions of human retinal pigment epithelium."
Author(s): Peng S, Gan G, Rao VS, Adelman RA, Rizzolo LJ
PubMed Article URL: http://dx.doi.org/10.1167/iovs.11-7590

Human / Not Cited

Experimental dermatology (Feb 2022; 31: 214)
"Acral peeling in Nagashima type palmo-plantar keratosis patients reveals the role of serine protease inhibitor B7 in keratinocyte adhesion."
PubMed Article URL: http://dx.doi.org/10.1111/exd.14444

519000 was used in western blot to investigate how serine proteases increase transepithelial electrical resistance

American journal of physiology. Gastrointestinal and liver physiology (Sep 2016; 311: G466)
"The serine protease-mediated increase in intestinal epithelial barrier function is dependent on occludin and requires an intact tight junction."
Author(s): Ronaghan NJ, Shang J, Jablakow V, Zaheer R, Colarusso P, Dion S, Desilets A, Leduc R, Turner JR, MacNaughton WK
PubMed Article URL: http://dx.doi.org/10.1152/ajpgi.00441.2015

Mouse / Not Cited
The Journal of cell biology (Sep 2005; 170: 1029)
"The Rac activator Tiam1 controls tight junction biogenesis in keratinocytes through binding to and activation of the Par polarity complex."
Author(s): Mertens AE, Rygiel TP, Olivo C, van der Kammen R, Collard JG
PubMed Article URL: http://dx.doi.org/10.1083/jcb.200502129

Mouse / Not Cited
Methods in molecular biology (Clifton, N.J.) (Nov 2011; 762: 213)
"Identification of claudins by western blot and immunofluorescence in different cell lines and tissues."
Author(s): González-Mariscal L, Garay E, Quirós M
PubMed Article URL: http://dx.doi.org/10.1007/978-1-61779-185-7_15

Human / Not Cited
Journal of cell science (Feb 2004; 117: 559)
"Mechanism of recruiting Sec6/8 (exocyst) complex to the apical junctional complex during polarization of epithelial cells."
Author(s): Yeaman C, Grindstaff K, Nelson WJ
PubMed Article URL: http://dx.doi.org/10.1242/jcs.00893

35 Immunohistochemistry References

Species / Dilution | Summary
--- | ---
51-9000 | 51-9000 was used in Immunohistochemistry to demonstrate that in the absence of CIC-2, adherens junctions are disrupted, revealing critical functions of the junctional structures, such as maintenance of homeostasis and differentiation.

Not Applicable / 1:500
American journal of physiology. Gastrointestinal and liver physiology (Dec 2018; 315: G966)
"Knockout of CIC-2 reveals critical functions of adherens junctions in colonic homeostasis and tumorigenicity."
Author(s): Jin Y, Ibrahim D, Magness ST, Blikslager AT
PubMed Article URL: http://dx.doi.org/10.1152/ajpgi.00087.2018

Mouse / Not Cited
International journal of oncology (Oct 2020; 57: 905)
"E7 oncoprotein from human papillomavirus 16 alters claudins expression and the sealing of epithelial tight junctions."
PubMed Article URL: http://dx.doi.org/10.3892/ijo.2020.5105

Dog / 1:500
American journal of physiology. Gastrointestinal and liver physiology (Apr 2011; 300: G586)
"Loss of Smad5 leads to the disassembly of the apical junctional complex and increased susceptibility to experimental colitis."
Author(s): Allaire JM, Darsigny M, Marcoux SS, Roy SA, Umans L, Zwijsen A, Boudreau F, Perreault N
PubMed Article URL: http://dx.doi.org/10.1152/ajpgi.00441.2010

Mouse / 1:500
American journal of physiology. Gastrointestinal and liver physiology (Jan 2013; 304: G278)
"Pre-emptive Short-term Nicotinamide Mononucleotide Treatment in a Mouse Model of Diabetic Nephropathy."
Author(s): Yasuda I, Hasegawa K, Sakamaki Y, Muraoka H, Kawaguchi T, Kusahana E, Ono T, Kanda T, Tokuyama H, Wakino S, Itoha H
PubMed Article URL: http://dx.doi.org/10.1681/ASN.2020081188


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51-9000 was used in immunohistochemistry to assess the effect of interferon-gamma on the barrier function of primary cultured human thyrocytes.

**Human / 1:100**

European journal of endocrinology (Sep 2003; 149: 215)

"Interferon-gamma down-regulates claudin-1 in primary cultured human thyrocytes."

Author(s): Tedelind S, Ericson LE, Karlsson JO, Nilsson M

PubMed Article URL: http://dx.doi.org/10.1530/eje.0,1490215

51-9000 was used in Immunohistochemistry-immunofluorescence to support a novel role for miR-21, independent of prior inflammation, in elicitation of pain and impairment of the BNB via RECK/MMP9.

**Human / 1:100**

Annals of the New York Academy of Sciences (Sep 2022; 1515: 184)

"MicroRNA-21-5p functions via RECK/MMP9 as a proalgesic regulator of the blood nerve barrier in nerve injury."

Author(s): Reinhold AK, Krug SM, Salvador E, Sauer RS, Karl-Schöller F, Malcangio M, Sommer C, Rittner HL

PubMed Article URL: http://dx.doi.org/10.1111/nyas.14816

51-9000 was used in Immunohistochemistry to show not only reduced expression of filaggrin and claudin 1 in lesional atopic skin but also inverse correlation of filaggrin expression and disease severity.

**Human / 1:400**

Journal of the European Academy of Dermatology and Venereology : JEADV (Jun 2015; 29: 1091)

"Profile of skin barrier proteins (filaggrin, claudins 1 and 4) and Th1/Th2/Th17 cytokines in adults with atopic dermatitis."

Author(s): Batista Di, Perez L, Orfali RL, Zaniboni MC, Samorano LP, Pereira NV, Sotto MN, Ishizaki AS, Oliveira LM, Sato MN, Aoki V

PubMed Article URL: http://dx.doi.org/10.1111/jdv.12753

51-9000 was used in immunohistochemistry to test if the expression of tight junction proteins increases in vessels of germinal matrix and cortex with gestational age.

**Not Applicable / 1:50**

Histology and cell biology (Feb 2007; 127: 205)

"Immunolocalization of tight junction proteins in blood vessels in human germinatal matrix and cortex."

Author(s): Anstrom JA, Thore CR, Moody DM, Brown WR

PubMed Article URL: http://dx.doi.org/10.1007/s00418-006-0232-2

51-9000 was used in Immunohistochemistry to indicate that TNFR1 is a promising therapeutic target for Alzheimer's disease treatment.

**Mouse / 1:1000**

EMBO molecular medicine (Apr 2018; 10: )

"Countering the effects of TNF receptor-1 has therapeutic potential in Alzheimer's disease."


PubMed Article URL: http://dx.doi.org/10.15252/emmm.201708300

51-9000 was used in Immunohistochemistry to investigate cerebrospinal fluid circulatory system during rat development.

**Rat / 0.625 µg/mL**

Fluids and barriers of the CNS (Mar 2015; 12: )

"Changes in the cerebrospinal fluid circulatory system of the developing rat: quantitative volumetric analysis and effect on blood-CSF permeability interpretation."

Author(s): Gheresi-Egea JF, Babikian A, Blondel S, Strazzielle N


51-9000 was used in Immunohistochemistry to characterize a graft source from human salivary glands.

**Human / Not Cited**

Tissue engineering, Part A (May 2011; 17: 1229)

"Matrigel improves functional properties of primary human salivary gland cells."

Author(s): Maria OM, Zeitouni A, Gologan O, Tran SD

PubMed Article URL: http://dx.doi.org/10.1089/ten.TEA.2010.0297

51-9000 was used in Immunohistochemistry to study the role of tanycyte-like cells in the blood-cerebrospinal fluid barrier in the circumventricular organs of mouse brain.

**Human / Not Cited**


"Cell junctional proteins in the human corpus luteum: changes during the normal cycle and after HCG treatment."

Author(s): Groten T, Fraser HM, Duncan WC, Konrad R, Kreienberg R, Wulff C

PubMed Article URL: http://dx.doi.org/10.1093/humrep/del286

51-9000 was used in Immunohistochemistry to study the role of tanycyte-like cells in the blood-cerebrospinal fluid barrier in the circumventricular organs of mouse brain.

**Mouse / 1:100**

The Journal of comparative neurology (Oct 2013; 521: 3389)

"Tanyocyte-like cells form a blood-cerebrospinal fluid barrier in the circumventricular organs of the mouse brain."

Author(s): Langlet F, Mullier A, Bouret SG, Prevot V, Dhoeuck B

PubMed Article URL: http://dx.doi.org/10.1002/cne.23355


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51-9000 was used in Immunohistochemistry-immunofluorescence to report on the development of a nanoparticle (C1C2-NP) that targets regions of increased claudin-1 expression that reduces BBB integrity.

Mouse / 1:100

"Claudin-1-Targeted Nanoparticles for Delivery to Aging-Induced Alterations in the Blood-Brain Barrier."
PubMed Article URL:http://dx.doi.org/10.1021/acs.nano.1c08432

51-9000 was used in Immunohistochemistry to define the step-by-step mechanisms that control stretch-mediated tissue expansion at single-cell resolution in vivo.

Human / 1:100

"Mechanisms of stretch-mediated skin expansion at single-cell resolution."
PubMed Article URL:http://dx.doi.org/10.1038/s41586-020-2555-7

51-9000 was used in Immunohistochemistry to indicate that HDAC inhibitors suppress the proliferation, migration and invasiveness of HNSCC by downregulating the p63-mediated tight junction molecules JAM-A and claudin-1, and inducing p63 or p21-mediated growth arrest.

Human / 1:400

"HDAC inhibitors suppress the proliferation, migration and invasiveness of human head and neck squamous cell carcinoma cells via p63-mediated tight junction molecules and p21-mediated growth arrest."
PubMed Article URL:http://dx.doi.org/10.3892/or.2021.7997

51-9000 was used in Immunohistochemistry to identify changes in junctional complexes in the ovine endometrium that regulate paracellular trafficking of water, ions, and other molecules, and the secretory capacity of the uterine epithelia.

Sheep / Not Cited

"Tight and adherens junctions in the ovine uterus: differential regulation by pregnancy and progesterone."
Author(s):Satterfield MC,Dunlap KA,Hayashi K,Burghardt RC,Spencer TE,Bazer FW
PubMed Article URL:http://dx.doi.org/10.1210/en.2007-0321

51-9000 was used in Immunohistochemistry to investigate how the loss of BMP signalling in TCFoxL1+ influences the severity of inflammation and fosters epithelial recovery after inflammatory stress.

Mouse / 1:50

"Altered Mucus Barrier Integrity and Increased Susceptibility to Collitis in Mice upon Loss of Telocyte Bone Morphogenetic Protein Signalling."
Author(s):Reyes Nicolás V,Allaire JM,Alfonso AB,Pupo Gómez D,Pomerleau V,Giroux V,Boudreau F,Perreault N
PubMed Article URL:http://dx.doi.org/10.3390/cells10112954

51-9000 was used in Immunohistochemistry to identify the functional tight junction barrier in human epidermis

Human / 1:200

"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,Amagai M,Kubo A
PubMed Article URL:http://dx.doi.org/10.1016/j.jdermsci.2013.04.021

51-9000 was used in immunohistochemistry to examine the architecture of cellular junctions present in blood and lymphatic vessel endothelium in peripheral lymph nodes

Not Applicable / Not Cited

"Distinct molecular composition of blood and lymphatic vascular endothelial cell junctions establishes specific functional barriers within the peripheral lymph node."
Author(s):Pfeiffer F,Kumar V,Butz S,Vestweber D,Imhof BA,Stein JV,Engelhardt B
PubMed Article URL:http://dx.doi.org/10.1022/eji.200838140

51-9000 was used in immunohistochemistry to define the step-by-step mechanisms that control stretch-mediated tissue expansion at single-cell resolution in vivo.

Human / 1:200

"Interleukin-2 receptor beta subunit-dependent and -independent regulation of intestinal epithelial tight junctions."
Author(s):Nishiyama R,Sakaguchi T,Kinugasa T,Gu X,MacDermott RP,Podolsky DK,Reinecker HC
PubMed Article URL:http://dx.doi.org/10.1074/jbc.M106013200

Genetic factors in immune function are evaluated through an analysis of genetic variability, which is facilitated by immunohistochemistry. This technology allows for the identification of specific cellular markers that are indicative of immune function, including the regulation of immune responses and the identification of immune cell populations. Immunohistochemistry is a powerful tool for the analysis of immune cells in both healthy and pathological conditions. It enables the detection of specific cellular markers and the visualization of immune cell populations, allowing for the study of immune function at the cellular and subcellular levels. Immunohistochemistry is widely used in research and clinical settings to provide insights into the function and activity of immune cells. It is particularly valuable in studies of immune function, where it can provide valuable insights into the mechanisms that underlie immune responses and the regulation of immune cell populations.
51-9000 was used in immunohistochemistry and western blot to examine the effect of hepatocyte growth factor treatment on the integrity and function of tight junctions and adherens junctions in the retinal pigment epithelial monolayer.

**Rat / 1:100**

*Investigative ophthalmology & visual science (Aug 2002; 43: 2782)*

"Regulation of RPE intercellular junction integrity and function by hepatocyte growth factor."

Author(s): Jin M,Barron E,He S,Ryan SJ,Hinton DR


**Mouse / Not Cited**

*Journal of immunology (Baltimore, Md.:) (Nov 2011; 187: 5255)*

"Cyclooxygenase-2 deficiency leads to intestinal barrier dysfunction and increased mortality during polymicrobial sepsis."

Author(s): Fredenburgh LE,Velandia MM,Mo J,Olszak T,Cernadas M,Englert JA,Chung SW,Liu X,Begay C,Padera RF,Blumberg RS,Walsh SR,Baron RM,Perrella MA

PubMed Article URL:http://dx.doi.org/10.4049/jimmunol.1101186

51-9000 was used in Immunohistochemistry to conclude that comorbid AR enhanced inflammation of CRS.

**Mouse / Not Cited**

*Scientific reports (Nov 2021; 11: )*

"Erythromycin reduces nasal inflammation by inhibiting immunoglobulin production, attenuating mucus secretion, and modulating cytokine expression."

Author(s): Yen TT,Jiang RS,Chang CY,Wu CY,Liang KL

PubMed Article URL:http://dx.doi.org/10.1038/s41598-021-01192-8

51-9000 was used in immunohistochemistry to determine the composition of the apical junctional complex present in lens epithelial cells

**Not Applicable / Not Cited**

*Experimental eye research (Jul 2008; 87: 64)*

"Expression and localisation of apical junctional complex proteins in lens epithelial cells."

Author(s): Sugiyama Y,Prescott AR,Tholozan FM,Ohno S,Quinlan RA

PubMed Article URL:http://dx.doi.org/10.1016/j.exer.2008.03.017

51-9000 was used in Immunohistochemistry to suggest that claudin-5 increased expression observed on normal skin, flat wart and cSCC showed association with EV.

**Human / 1:100**

*Scientific reports (Jun 2020; 10: )*

"Claudin expression profile in flat wart and cutaneous squamous cell carcinoma in epidermodysplasia verruciformis."

Author(s): da Cruz Silva LL,de Oliveira WRP,Pereira NV,Haalpenn I,Tanabe CKD,Mattos MSG,Sotto MN

PubMed Article URL:http://dx.doi.org/10.1038/s41598-020-66065-y

51-9000 was used in Western Blotting to reveal HIF-1’s critical role in maintaining barrier and highlight the HIF-1/claudin-1 axis as a potential therapeutic target for EoE.

**Mouse / Not Cited**

*The Journal of clinical investigation (Jul 2019; 129: 3224)*

"Epithelial HIF-1/1-claudin-1 axis regulates barrier dysfunction in eosinophilic esophagitis."

Author(s): Masterson JC,Biette KA,Hammer JA,Nguyen N,Capocelli KE,Saeedi BJ,Harris RF,Fernando SD,Hosford LB,Kelly CJ,Campbell EL,Ehrentraut SF,Ahmed FN,Nakagawa H,lee JJ,McNamee EN,Glover LE,Colgan SP,Furuta GT

PubMed Article URL:http://dx.doi.org/10.1172/JCI126744

51-9000 was used in immunohistochemistry to determine the expression pattern of selected components involved in the formation of tight junctions in relation to gastroesophageal reflux disease

**Not Applicable / 1:50**

*BMC gastroenterology (Sep 2012; 12: )*

"Role of tight junction proteins in gastroesophageal reflux disease."

Author(s): Mönkemüller K,Wex T,Kuester D,Fry LC,Kropf S,Roessner A,Malfertheiner P

PubMed Article URL:http://dx.doi.org/10.1186/1471-230X-12-128

51-9000 was used in Immunohistochemistry to conclude that short-term NMN treatment in FSGS has epigenetic renal protective effects through the upregulation of Sirt1 and suppression of the NAD and NMN consumers.

**Mouse / 1:50**

*Scientific reports (Aug 2022; 12: )*

"Nicotinamide mononucleotide ameliorates adriamycin-induced renal damage by epigenetically suppressing the NMN/NAD consumers mediated by Twist2."

Author(s): Hasegawa K,Sakamaki Y,Tamaki M,Wakino S

PubMed Article URL:http://dx.doi.org/10.1038/s41598-022-18147-2
51-9000 was used in Western Blot, Immunohistochemistry to analyze functional, molecular and regulatory effects of Tumor necrosis factor alpha (TNF) in a newly established non-transformed jejunal enterocyte model, namely IPEC-J2 monolayers.

Pig / Not Cited

"Tumor Necrosis Factor Alpha Effects on the Porcine Intestinal Epithelial Barrier Include Enhanced Expression of TNF Receptor 1."
Author(s): Droessler L, Cornelius V, Markov AG, Amasheh S
PubMed Article URL: http://dx.doi.org/10.3390/jimss22168746

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51-9000 was used in Immunohistochemistry to study the gastrointestinal mucosa as a extrahepatic viral replication site and its contribution to Hepatitis C virus recurrence.

Human / 1:50

PloS one (Sep 2017; 12: )
"HCV replication in gastrointestinal mucosa: Potential extra-hepatic viral reservoir and possible role in HCV infection recurrence after liver transplantation."
PubMed Article URL: http://dx.doi.org/10.1371/journal.pone.0181683

51-9000 was used in immunohistochemistry to report the expression of tight junction proteins in the perineurium of adult human peripheral nerve.

Not Applicable / 1:100

"Tight junction proteins ZO-1, occludin, and claudins in developing and adult human perineurium."
Author(s): Pummi KP, Heape AM, Grénman RA, Peltonen JT, Peltonen SA
PubMed Article URL: http://dx.doi.org/10.1369/jhc.3A6217.2004

51-9000 was used in Immunohistochemistry to present that the embryonic ChP forms a functional brain barrier that can mount an inflammatory response to external insults.

Mouse / Not Cited

Developmental cell (Dec 2020; 55: 617)
"Inflammation of the Embryonic Choird Plexus Barrier following Maternal Immune Activation."
Author(s): Cui J, Shipleb FY, Shannon ML, Alturkistani O, Dani N, Webb MD, Sugden AU, Andermann ML, Lehtinen MK
PubMed Article URL: http://dx.doi.org/10.1016/j.devcel.2020.09.020

51-9000 was used in Immunohistochemistry to elucidate the role of CDH in the mouse uterus.

Mouse / 1.25 μg/mL

Biology of reproduction (May 2012; 86: 141, 1)
"CDH1 is essential for endometrial differentiation, gland development, and adult function in the mouse uterus."
Author(s): Reardon SN, King ML, MacLean JA, Mann JL, DeMayo FJ, Lydon JP, Hayashi K
PubMed Article URL: http://dx.doi.org/10.1095/biolreprod.112.098871

51-9000 was used in Immunohistochemistry to demonstrate that deletion of Fat1, which encodes a protocadherin, promotes malignant progression by controlling cell polarity and adhesion between tumour cells, and between tumour cells and the extracellular matrix.

Nature (Jan 2021; 589: 448)
"Fat1 deletion promotes hybrid EMT state, tumour stemness and metastasis."
PubMed Article URL: http://dx.doi.org/10.1038/s41586-020-03046-1

55 Immunocytochemistry References

Species / Dilution

Summary

51-9000 was used in Immunocytochemistry-immunofluorescence to reveal that the transmission Kaposi’s sarcoma-associated herpesvirus (KSHV) infection, which is promoted by the exosomes in the saliva of people living with human immunodeficiency virus (HIV), can reduced by the inhibition of epidermal growth factor receptor (EGFR).

Human / Not Cited

Journal of virology (Apr 2020; 94: )
"Human Immunodeficiency Virus-Associated Exosomes Promote Kaposi’s Sarcoma-Associated Herpesvirus Infection via the Epidermal Growth Factor Receptor."
Author(s): Chen L, Feng Z, Yuan G, Emerson CC, Stewart PL, Ye F, Jin G
PubMed Article URL: http://dx.doi.org/10.1128/JVI.01782-19


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PubMed Article URL: http://dx.doi.org/10.1128/JVI.01782-19


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<th>Species</th>
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<td>Human</td>
<td>Not Cited</td>
<td>&quot;Phosphorylation of claudin-4 is required for tight junction formation in a human keratinocyte cell line.&quot;</td>
<td><a href="http://dx.doi.org/10.1016/j.yexcr.2008.08.012">http://dx.doi.org/10.1016/j.yexcr.2008.08.012</a></td>
<td>Aono S, Hirai Y</td>
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<td>&quot;Function of the bovine rumen epithelium.&quot;</td>
<td><a href="http://dx.doi.org/10.1152/ajpregu.00425.2004">http://dx.doi.org/10.1152/ajpregu.00425.2004</a></td>
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<td>&quot;Astrocyte mediated modulation of blood-brain barrier permeability does not correlate with a loss of tight junction proteins from the cellular contacts.&quot;</td>
<td><a href="http://dx.doi.org/10.1242/jcb.22673">http://dx.doi.org/10.1242/jcb.22673</a></td>
<td>Amasheh S, Meiri N, Gitter AH, Schönberg T, Mankertz J, Schulzke JD, Fromm M</td>
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<td>&quot;Foxa2 regulates polarized epithelial cells through coordinate expression of adherens and tight junction proteins.&quot;</td>
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<td>Munguía B, Juárez V, González-Mariscal L</td>
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Procedures of the National Academy of Sciences of the United States of America (Oct 2004; 101: 14877)
“Paracellular Cl- permeability is regulated by WNK4 kinase: insight into normal physiology and hypertension.”
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Author(s): Musch MW, Walsh-Reitz MM, Chang EB
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Molecular biology of the cell (Sep 2011; 22: 3192)
“Functional ESCRT machinery is required for constitutive recycling of claudin-1 and maintenance of polarity in vertebrate epithelial cells.”
Author(s): Dukes JD, Fish L, Richardson JD, Blaikley E, Burns S, Cauton CJ, Chalmers AD, Whitley P
PubMed Article URL:http://dx.doi.org/10.1091/mbc.E11-04-0343

The American journal of pathology (Feb 2013; 182: 431)
“miR-199a-5p regulates urothelial permeability and may play a role in bladder pain syndrome.”
Author(s): Monastyrskaya K, Sánchez-Freire V, Hashemi Gheinani A, Klumpp DJ, Babiychuk EB, Draeger A, Burkhard FC
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“Helicobacter pylori-induced disruption of monolayer permeability and proinflammatory cytokite secretion in polarized human gastric epithelial cells.”
Author(s): Fiorentino M, Ding H, Blanchard TG, Czzinn SJ, Sztein MB, Fasano A
PubMed Article URL:http://dx.doi.org/10.1128/JBC.20021406-12

The Journal of biological chemistry (Mar 2013; 81: 876)
“Helicobacter pylori-induced disruption of monolayer permeability and proinflammatory cytokite secretion in polarized human gastric epithelial cells.”
Author(s): Fiorentino M, Ding H, Blanchard TG, Czzinn SJ, Sztein MB, Fasano A
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“Differences in claudin synthesis in primary cultures of acinar cells from rat salivary gland are correlated with the specific three-dimensional organization of the cells.”
PubMed Article URL:http://dx.doi.org/10.1007/s00441-006-0939-3

Cell and tissue research (Feb 2005; 319: 315)
“Changes in the distribution of ZO-1, occludin, and claudins in the rat uterine epithelium during the estrous cycle.”
Author(s): Mendoza-Rodriguez CA, González-Mariscal L, Cerdón M
PubMed Article URL:http://dx.doi.org/10.1007/s00441-004-1010-7

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Not Applicable / 1:100
Tissue barriers (Oct 2013; 1: )
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<td>51-9000 was used in Immunocytochemistry to suggest that injured podocytes upregulate MIF and SDF1 that stimulate CD44 expression and CD44-mediated migration, which is enhanced by endogenous MIF and SDF1 in PECs.</td>
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<td>51-9000 was used in Enzyme-linked immunosorbent assay to confirm the therapeutic effect of Abelmoschus manihot on ulcerative colitis (UC) and explore its mechanism.</td>
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51-9000 was used in western blot to elucidate the contribution of SPRY2 to colon cancer.

**Human / Not Cited**

Oncogene (Jun 2016; 35: 2991)

"SPROUTY-2 represses the epithelial phenotype of colon carcinoma cells via upregulation of ZEB1 mediated by ETS1 and miR-200/miR-150."


PubMed Article URL: http://dx.doi.org/10.1038/onc.2015.366

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**Mouse / 1:100**

Parasite immunology (Apr 2010; 32: 221)

"Impairment of intestinal barrier and secretory function as well as egg excretion during intestinal schistosomiasis occur independently of mouse mast cell protease-1."

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Dermatology reports (Nov 2009; 1: )

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Author(s): Raiko L, Leinonen P, Hagg PM, Peltonen J, Oikarinen A, Peltonen S

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**Pig / 1:1000**

The British journal of nutrition (May 2018; 119: 1019)

"Medium-chain TAG improve intestinal integrity by suppressing toll-like receptor 4, nucleotide-binding oligomerisation domain proteins and necroptosis signalling in weaning piglets challenged with lipopolysaccharide."


PubMed Article URL: http://dx.doi.org/10.1017/S0007145180003X

### 10 Immunohistochemistry (Paraffin) References

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<td>Human / Not Cited</td>
<td>51-9000 was used in Immunohistochemistry on paraffin embedded tissues-immunofluorescence to study the role of claudin-3 in preventing sweat gland leakage.</td>
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**Mouse / Not Cited**

The Journal of investigative dermatology (Jun 2018; 138: 1279)

"Claudin-3 Loss Causes Leakage of Sweat from the Sweat Gland to Contribute to the Pathogenesis of Atopic Dermatitis."


PubMed Article URL: http://dx.doi.org/10.1016/j.jid.2018.03.012

51-9000 was used in immunohistochemistry - paraffin section and western blot examine tight junction function in atopic dermatitis samples.

**Human / Not Cited**

PloS one (Aug 2017; 11: )

"Impaired Tight Junctions in Atopic Dermatitis Skin and in a Skin-Equivalent Model Treated with Interleukin-17."

Author(s): Yuki T, Tobishii M, Kusaka-Kikushima A, Ota Y, Tokura Y

PubMed Article URL: http://dx.doi.org/10.1371/journal.pone.0161759

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**Human / 5 μg/mL**

Gut (May 2014; 63: 711)

"Nrf2 deficiency impairs the barrier function of mouse esophageal epithelium."

Author(s): Chen H, Hu Y, Fang Y, Djukic Z, Yamamoto M, Shaheen NJ, Orlando RC, Chen X

PubMed Article URL: http://dx.doi.org/10.1136/gutjnl-2012-303731
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51-9000 was used in immunohistochemistry - paraffin section to study the integrity of the epidydimal epithelial-blood barrier in protein cathepsin A knockout mice

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"Claudin 1 differentiates endometrioid and serous papillary endometrial adenocarcinoma."  
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"Immunohistological study of tight junction protein expression in mal de Meleda."  
Author(s): Hermo L, Korah N, Liu LY, Liu Z, Zaraa I, Mokni M, Boubaker S  
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7 Immunohistochemistry (Frozen) References

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<td>51-9000 was used in immunohistochemistry - frozen section to examine tight junction protein expression in venous leg ulcers</td>
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| Clinical and experimental dermatology (Dec 2009; 34: e949)  
"Expression of tight-junction proteins in the inflamed and clinically uninvolved skin in patients with venous leg ulcers."  
Author(s): Zorko MS, Veranic P, Leskovec NK, Pavlovi MD, Lunder T  
PubMed Article URL:http://dx.doi.org/10.1111/j.1365-2230.2009.03591.x |
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Not Applicable / Not Cited

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Author(s): Yamashita S
PubMed Article URL: http://dx.doi.org/10.1016/j.prog.h.2006.09.001

51-9000 was used in immunohistochemistry - frozen section and western blot to examine the cellular distributions of tight junction components during early pregnancy and under various hormonal regimens

Not Applicable / 2.5 µg/ml

"Ovarian hormones control the changing expression of claudins and occludin in rat uterine epithelial cells during early pregnancy."
Author(s): Nicholson MD, Lindsay LA, Murphy CR
PubMed Article URL: http://dx.doi.org/10.1016/j.acthis.2008.07.003

51-9000 was used in immunohistochemistry - frozen section to discuss the contribution of the epidermal permeability barrier to health

Not Applicable / 1:200

"Effects of in utero exposure of C57BL/6j mice to 2,3,7,8-tetrachlorodibenzo-p-dioxin on epidermal permeability barrier development and function."
Author(s): Muñeyri CS, Carion SL, Jones LA, Kennedy LH, Slominski AT, Sutter CH, Sutter TR
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51-9000 was used in immunohistochemistry - frozen section to study how influenza A virus invades the brain

Not Applicable / 1:25

"Endothelia of term human placenta display diminished expression of tight junction proteins during preeclampsia."
Author(s): Liéyano S, Alarcón L, Chávez-Munguía B, González-Mariscal L
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Author(s): Yan HH, Mruk DD, Lee WM, Cheng CY
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"Protein kinase C signaling regulates ZO-1 translocation and increased paracellular flux of T84 colonocytes exposed to Clostridium difficile toxin A."
Author(s): Chen ML, Pothoulakis C, LaMont JT
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Mouse / Not Cited

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"The tight junction protein ZO-2 localizes to the nucleus and interacts with the heterogeneous nuclear ribonucleoprotein scaffold attachment factor-B."
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PubMed Article URL: http://dx.doi.org/10.1074/jbc.M206821200
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