IP3 Receptor I Antibody

**Product Data Sheet**

### General Information

**Storage Conditions:**
- **Preservative:** 0.05% sodium azide
- **Storage Buffer:** PBS with 1 mg/ml BSA
- **Form:** Liquid
- **Concentration:** 1.3 mg/ml
- **Purification:** Antigen affinity chromatography
- **Storage Conditions:** -20°C, Avoid Freeze/Thaw Cycles

### Tested Applications

- **Western Blot (WB):** See publications
- **Immunofluorescence (IF):** See publications
- **Immunohistochemistry (IHC):** See publications
- **Immunoprecipitation (IP):** See publications

### Dilution

- **Western Blot (WB):** 1:1,000
- **Immunofluorescence (IF):** Assay dependent
- **Immunohistochemistry (Frozen):** 1:250
- **Immunoprecipitation (IP):** Assay dependent

### Published Applications

**Immunoprecipitation (IP):** Assay dependent

### Immunogen

- **Synthetic Peptide:** N(1829) K K K D D E V D R D A P S R K K A K E(1848)

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### General Information

Inositol 1,4,5-trisphosphate (IP3) is a second messenger for many growth factors, hormones, and neurotransmitters. Upon binding to the IP3 receptor (IP3), IP3 triggers the release of intracellular, luminal calcium to the cytosol. Functional IP3R is a homo- or heterotetramer of ~240 kDa glycoprotein subunits, that is structurally reminiscent of members of the voltage-gated ion channel superfamily. IP3R protein is structurally and functionally related to one other important intracellular calcium-release channel, the ryanodine receptor. The similarity between the two receptors continues at the physiological level owing to a physical association each receptor can have with the immunophilin protein, FKBP12. Cytosolic calcium levels appear to be regulated by a feedback loop that starts with calcium activation of protein kinase C (PKC) and calcineurin, a protein phosphatase. Phosphorylation of the IP3R by PKC causes an increase in IP3-mediated calcium release. Concomitantly, the phosphatase activity of calcineurin is stimulated upon its association with the FKBP12-IP3R complex. Calcium release is reduced when the PKC target site on the IP3R is dephosphorylated by calcineurin resulting in calcium oscillations.

Mammalian IP3R subunits are the product of three distinct genes that are widely expressed and differentially regulated. IP3R type I (IP3R-I) has been detected in heart, liver, kidney, and Purkinje neurons of the cerebellum. IP3R-II is known to be expressed in pancreatic islets, kidney, and the gastrointestinal tract.

PA1-901 detects inositol 1,4,5-trisphosphate receptor type-I (IP3R-I) from canine, mouse, and rat tissues.

PA1-901 has been successfully used in Western blot, immunohistochemistry, immunofluorescence and immunoprecipitation procedures. By Western blot, this antibody detects an ~240 kDa protein representing IP3R-I from rat and mouse brain extract. Immunohistochemical staining of IP3R-I in rat cerebellum with PA1-901 results in staining of Purkinje cells.

PA1-901 immunizing peptide corresponds to amino acid residues 1829-1848 from human IP3R-I. This sequence is completely conserved in human, mouse, and rat IP3R-I. PA1-901 immunizing peptide (Cat. # PEP-019) is available for use in neutralization and control experiments.

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Immunofluorescence with anti-IP3 Receptor I Polyclonal Antibody (PA1-901)

Immunolocalization of IP3 receptor type I in rat cerebellum using PA1-901.

Fig. 1
<table>
<thead>
<tr>
<th>Species / Dilution</th>
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</table>
| Hm / Not Cited    | **PA1-901** was used in western blot to investigate the effects of the three InsP3R isoforms on the transmission of calcium signals to mitochondria.


Author(s): Mendes CC, Gomes DA, Thompson M, Souto NC, Goes TS, Goes AM, Rodrigues MA, Gomez MV, Nathanson MH, Leite MF

Number of Citations: 1


| Ms / Not Cited    | **PA1-901** was used in western blot to study the mechanism for the inhibitory effect of TGF-beta on inositol 1,4,5-trisphosphate receptors in mesangial cells.


"Inhibition of type I and III IP(3)Rs by TGF-beta is associated with impaired calcium release in mesangial cells."


Number of Citations: 0


| Ms / 1:1,000      | **PA1-901** was used in western blot and immunocytochemistry to study the function and localization of inositol trisphosphate receptors in myotubes and a novel calcium signaling pathway.


"IP(3) receptor function and localization in myotubes: an unexplored Ca(2+) signaling pathway in skeletal muscle."


Number of Citations: 9


| Ms / Not Cited    | **PA1-901** was used in immunocytochemistry and western blot to demonstrate the existence of a potential relationship between mini-dystrophin and SR calcium release.

J Gen Physiol. 2006 Feb;127(2):171-82.

"Mini-dystrophin expression down-regulates overactivation of G protein-mediated IP3 signaling pathway in dystrophin-deficient muscle cells."

Author(s): Balghi H, Sebille S, Constantin B, Patri S, Thoreau V, Mondin L, Mok E, Kitzis A, Raymond G, Cognard C

Number of Citations: 1


| Ms / Not Cited    | **PA1-901** was used in immunocytochemistry and western blot to study how dystrophin affects IP3-mediated calcium signaling pathway in resting myotubes.


"Mini-dystrophin expression down-regulates IP3-mediated calcium release events in resting dystrophin-deficient muscle cells."

Author(s): Balghi H, Sebille S, Mondin L, Cantereau A, Constantin B, Raymond G, Cognard C

Number of Citations: 1


| Ms / 1:3000       | **PA1-901** was used in immunohistochemistry and western blot to investigate the regulatory role of calcium signals in the activity of multidrug resistance-associated protein 2 in mouse liver.


"Regulation of multidrug resistance-associated protein 2 by calcium signaling in mouse liver."

Author(s): Cruz LN, Guerra MT, Kruglov E, Mennone A, Garcia CR, Chen J, Nathanson MH

Number of Citations: 5


| Ms / Not Cited    | **PA1-901** was used in western blot to investigate the importance of triadins in the regulation of resting cytoplasmic calcium.


"Ablation of skeletal muscle triadin impairs FKBP12/RyR1 channel interactions essential for maintaining resting cytoplasmic Ca2+.

Author(s): Elliott JM, Feng W, Lopez JR, Padilla IT, Pessah IN, Molinski TF, Fruen BR, Allen PD, Perez CF

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Author(s): Elliott JM, Feng W, Lopez JR, Padilla IT, Pessah IN, Molinski TF, Fruen BR, Allen PD, Perez CF

Number of Citations: 1

Rt / 1:4,000

PA1-901 was used in immunoprecipitation and western blot to investigate the role of calcineurin during dynamic calcium-sensitive regulation of IP3-mediated calcium flux.

Cell. 1995 Nov 3;83(3):463-72.  "Calcineurin associated with the inositol 1,4,5-trisphosphate receptor-FKBP12 complex modulates Ca2+ flux."  
Author(s): Cameron AM, Steiner JP, Roskams AJ, Ali SM, Ronnett GV, Snyder SH  
Number of Citations: 75  

Rt / 1:1000

PA1-901 was used in immunocytochemistry and western blot to study the role of InsP3 receptor type 2 in calcium transients in rat adrenal chromaffin cells.

Cell Calcium. 2004 Jan;35(1):59-70.  "InsP3 receptor type 2 and oscillatory and monophasic Ca2+ transients in rat adrenal chromaffin cells."  
Author(s): Inoue M, Lin H, Imanaga I, Ogawa K, Warashina A  
Number of Citations: 1  

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Author(s): Mendes CC, Gomes DA, Thompson M, Souto NC, Goes TS, Goes AM, Rodrigues MA, Gomez MV, Nathanson MH, Leite MF  
Number of Citations: 8  

Rt / Not Cited

PA1-901 was used in immunohistochemistry and western blot to investigate the mechanism for the calcium dysregulation in smooth muscle cells with type 1 diabetes.

Cardiovasc Diabetol. 2010 Feb 1;9(8):  "Intracellular Ca2+ regulating proteins in vascular smooth muscle cells are altered with type 1 diabetes due to the direct effects of hyperglycemia."  
Author(s): Searle YM, Logathan R, Smirnova IV, Stethno-Bittel L  
Number of Citations: 8  

Rt / Not Cited

PA1-901 was used in western blot to evaluate the role of calcium signalling in heterosynaptic plasticity.

Author(s): Reissner KJ, Pu L, Schaffhausen JH, Boyle HD, Smith IF, Parker I, Carew TJ  
Number of Citations: 0  

Rt / Not Cited

PA1-901 was used in western blot to investigate the effect of taxol on calcium signalling and calcium oscillation.

Author(s): Zhang K, Heidrich FM, DeGray B, Boehmerle W, Ehrlich BE  
Number of Citations: 1  

Rt / 1:1000

PA1-901 was used in immunohistochemistry and western blot to investigate the role of sigma1-receptor Sig-1R in calcium signaling in liver cells.

Author(s): Abou-Lovergne A, Collado-Hilly M, Monnet FP, Koukou O, Prigent S, Coquille JF, Dupont G, Combettes L  
Number of Citations: 0  

Rt / 1:750

PA1-901 was used in western blot to investigate the arterial smooth muscle calcium signaling and vascular functions in Milan hypertensive rats.

Author(s): Linde CI, Karashima E, Raina H, Zulian A, Wier WG, Hamlyn JM, Ferrari P, Blaustein MP, Golovina VA  
Number of Citations: 0  
### Summary

- **Hm / 1:30**: PA1-901 was used in immunocytochemistry to study the role of calcium in herpes simplex viruses entry.
  
  **Am J Physiol Cell Physiol. 2004 Oct;287(4):C1114-24.** "Plasma and intracellular membrane inositol 1,4,5-trisphosphate receptors mediate the Ca(2+) increase associated with the ATP-induced increase in ciliary beat frequency."  
  
  **Author(s):** Barrera NP, Morales B, Villalón M  
  
  **Number of Citations:** 1  
  

- **Hu / 1:200**: PA1-901 was used in immunocytochemistry to study the regulation of ciliary beat frequency.  
  
  **Mol Biol Cell. 2007 Aug;18(8):3119-30.** "Multiple receptor interactions trigger release of membrane and intracellular calcium stores critical for herpes simplex virus entry."  
  
  **Author(s):** Cheneshko N, Liu W, Satlin LM, Herold BC  
  
  **Number of Citations:** 1  
  

- **Ms / 1:25, 54 ug/ml**: PA1-901 was used in western blot and immunocytochemistry to study the function and localization of inositol trisphosphate receptors in myotubes and a novel calcium signaling pathway.  
  
  **J Cell Sci. 2001 Oct;114(Pt 20):3673-83.** "IP(3) receptor function and localization in myotubes: an unexplored Ca(2+) signaling pathway in skeletal muscle."  
  
  **Author(s):** Powell JA, Carrasco MA, Adams DS, Drouet B, Rios J, Müller M, Estrada M, Jaimovich E  
  
  **Number of Citations:** 4  
  

- **Ms / 1:25**: PA1-901 was used in immunocytochemistry to demonstrate the effect of electrical activity on IP3-associated calcium signals.  
  
  **J Neurosci. 2003 Sep 10;23(23):8185-92.** "IP3 receptors and associated Ca2+ signals localize to satellite cells and to components of the neuromuscular junction in skeletal muscle."  
  
  **Author(s):** Powell JA, Molgó J, Adams DS, Colasante C, Williams A, Bohlen M, Jaimovich E  
  
  **Number of Citations:** 4  
  

- **Ms / 1:250**: PA1-901 was used in immunocytochemistry and western blot to demonstrate the existence of a potential relationship between mini-dystrophin and SR calcium release.  
  
  
  **Author(s):** Balghi H, Sebille S, Constantin B, Patri S, Thoreau V, Mondin L, Mok E, Kitzis A, Raymond G, Cognard C  
  
  **Number of Citations:** 1  
  

- **Ms / 1:250**: PA1-901 was used in immunocytochemistry and western blot to study how dystrophin affects IP3-mediated calcium signaling pathway in resting myotubes.  
  
  
  **Author(s):** Balghi H, Sebille S, Mondin L, Cantereau A, Constantin B, Raymond G, Cognard C  
  
  **Number of Citations:** 1  
  

- **Ms / 1:1000**: PA1-901 was used in immunocytochemistry to investigate the differentiation into cerebellar Purkinje cells from mouse embryonic stem cells.  
  
  
  **Author(s):** Tao O, Shimazaki T, Okada Y, Naka H, Kohda K, Yuzaki M, Mizusawa H, Okano H  
  
  **Number of Citations:** 9  
  
PA1-901 was used in immunocytochemistry to study the role of type III IP3 receptor (IP3R3) in bitter taste transduction.

"Immunocytochemical evidence for co-expression of Type III IP3 receptor with signaling components of bitter taste transduction."
Author(s): Clapp TR, Stone LM, Margolskee RF, Kinnamon SC
Number of Citations: 21

PA1-901 was used in immunocytochemistry and western blot to study the role of InsP3 receptor type 2 in calcium transients in rat adrenal chromaffin cells

"InsP3 receptor type 2 and oscillatory and monophasic Ca2+ transients in rat adrenal chromaffin cells."
Author(s): Inoue M, Lin H, Imanaga I, Ogawa K, Warashina A
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Cardiovasc Diabetol. 2010 Feb 19;9:
"Intracellular Ca2+ regulating proteins in vascular smooth muscle cells are altered with type 1 diabetes due to the direct effects of hyperglycemia."
Author(s): Searls YM, Loganathan R, Smirnova IV, Stehno-Bittel L
Number of Citations: 8

### 5 Immunohistochemistry References

<table>
<thead>
<tr>
<th>Species / Dilution</th>
<th>Summary</th>
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<tr>
<td>Ms / 1:100</td>
<td>PA1-901 was used in immunohistochemistry to suggest that ET-1 activation of calcium sparks is mediated via the ETA receptor-PLC-IP3 pathway.</td>
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<tr>
<td>&quot;ET-1 activates Ca2+ sparks in PASMC: local Ca2+ signaling between inositol trisphosphate and ryanodine receptors.&quot;</td>
<td></td>
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<tr>
<td>Author(s): Zhang WM, Yip KP, Lin MJ, Shimoda LA, Li WH, Sham JS</td>
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<td>Number of Citations: 1</td>
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| Ms / 4x102 | PA1-901 was used in immunohistochemistry to investigate the patterns of inositol 1,4,5-trisphosphate receptor expression in individual subtypes of enteroendocrine cells in the mouse small intestine |
| "Individual subtypes of enteroendocrine cells in the mouse small intestine exhibit unique patterns of inositol 1,4,5-trisphosphate receptor expression." |
| Author(s): Wang S, Liu J, Li L, Wice BM |
| Number of Citations: 1 |

| Ms / Not Cited | PA1-901 was used in immunohistochemistry and western blot to investigate the regulatory role of calcium signals in the activity of multidrug resistance-associated protein 2 in mouse liver |
| "Regulation of multidrug resistance-associated protein 2 by calcium signaling in mouse liver." |
| Author(s): Cruz LN, Guerra MT, Kruglov E, Mennone A, Garcia CR, Chen J, Nathanson MH |
| Number of Citations: 5 |

| Rt / 1:50-1:200 | PA1-901 was used in immunohistochemistry to investigate the localization and role of inositol 1,4,5-trisphosphate receptor in the vomeronasal organ |
| "Type-specific inositol 1,4,5-trisphosphate receptor localization in the vomeronasal organ and its interaction with a transient receptor potential channel, TRPC2." |
| Author(s): Brann JH, Dennis JC, Morrison EE, Fadool DA |
| Number of Citations: 3 |
PA1-901 was used in immunohistochemistry and western blot to investigate the role of sigma1-receptor Sig-1R in calcium signaling in liver cells.

"Investigation of the role of sigma1-receptors in inositol 1,4,5-trisphosphate dependent calcium signaling in hepatocytes."
Author(s): Abou-Lovergne A, Collado-Hilly M, Monnet FP, Koukoui O, Prigent S, Coquil JF, Dupont G, Combettes L
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<tr>
<td></td>
<td>Author(s): Cameron AM, Steiner JP, Roskams AJ, Ali SM, Ronnett GV, Snyder SH</td>
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