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Monoclonal Antibody to human TLR9 (Toll-like receptor 9)/CD289-Atto 488

Catalog No : **IMG-305F**
Formulation : 100 ug in 200 ul PBS containing 0.05% sodium azide. Sodium azide is highly toxic.
Isotype : Mouse IgG1, k
Clone : 26C593.2
Purification : Protein G Chromatography
Species React : Horse, Human, Mouse, Rat, Rhesus Monkey
Host : Mouse

Application
Flow (Intracellular): 0.5-2 ug/ 1x10^6 cells
IF/ICC: see Greene et. al. (2005)
Flow (Cell Surface): see Lee et al. (2006)
see Greene et. al. (2005)

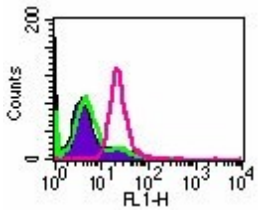
Storage
Store at 4°C, stable for 6 months. DO NOT FREEZE; MATERIAL IS LIGHT-SENSITIVE.

Recommended Positive Control: Ramos cells

Background
The Toll-like receptor (TLR) family in mammal comprises a family of transmembrane proteins characterized by multiple copies of leucine rich repeats in the extracellular domain and IL-1 receptor motif in the cytoplasmic domain. Like its counterparts in Drosophila, TLRs signal through adaptor molecules (1). The TLR family is a phylogenetically conserved mediator of innate immunity that is essential for microbial recognition (2). Ten human homologs of TLRs (TLR1-10) have been described (3). By using a BLAST search, Hemmi et al., 2000 (5) have identified and subsequently isolated a cDNA coding for TLR9. Gene knockout experiments suggest that TLR9 acts as a receptor for unmethylated CpG dinucleotides in the bacterial DNA (4). Human and mouse TLR9 share an overall amino-acid identity of 75.5%. TLR9 is highly expressed in spleen.

Antigen
This antibody was developed against KLH-conjugated synthetic peptide corresponding to amino acids 268-284 of human TLR9 isoform A (Genbank accession no. AAF78037).

Genebank Info (Protein)
NP_059138



Flow analysis of TLR9 in Ramos cells using 0.5 ug of IMG-305F. Shaded histogram represents Ramos cells without antibody; green represents isotype control (BD Pharmingen #557721); purple represents anti-TLR9 antibody.

Related Products
1. IMG-305D [Monoclonal Antibody to TLR9/CD289 (Clone 26C593.2)]
2. IMG-305B [Monoclonal Antibody to TLR9/CD289 (Clone 26C593.2) Biotin Conjugate]
3. IMG-305C [Monoclonal Antibody to TLR9/CD289 (Clone 26C593.2)]
4. 10083K [IC-Flow (Intracellular Staining Flow Assay) Kit]

Reference
1. Muzio M, Natoli G, Saccani S, Levrero M, and Mantovani A. J. exp. Med. 187: 2097-2101 (1998).
2. Medzhitov R and Janeway CA. Cell 91: 295-298 (1997).
3. Chuang TH and Ulevitch RJ. Biochim. Biophys. Acta 1518 (1-2):157-161 (2001)
4. Takeuchi O, Kawai T, Sanjo H, Copeland NG, Gilbert DJ, Jenkins NA, Takeda K, and Akira S. Gene 231: 59-65 (1999).
5. Hemmi H, Takeuchi O, Kawai T, Kaisho T, Sato S, Sanjo H, Matsumoto M, Hoshino K, Wagner H, Takeda K, and Shizo A. Nature 408: 740-745 (2000).

Product Citations
1. Expression of mRNA and proteins for toll-like receptors, associated molecules, defensins and LL-37 by SRIK-NKL, a CD8+ NK/T cell line. Maya D. Srivastava and B.I.S. Srivastava. *Leukemia Res.,* 29: 813-820 (2005). **(IMG-305A)**
2. TLR-Induced Inflammation in Cystic Fibrosis and Non-Cystic Fibrosis Airway Epithelial Cells. Catherine M. Greene, Tomás P. Carroll, Stephen G. J. Smith, Clifford C. Taggart, James Devaney, Siobhan Griffin, Shane J. O Neill, and Noel G. McElvaney. *J. Immunol.,* 174: 1638-1646 (2005). **Imgenex antibodies cited: 1. TLR9 (IMG-305) [Confocal Microscopy, Fig.1A and 1B (CFTE29o- and 16HBE14o- cells)].**
3. Cytoplasmic domain-mediated dimerizations of toll-like receptor 4 observed by lactamase enzyme fragment complementation. Hyun-Ku Lee, Stefan Dunzendorfer, and Peter S. Tobias. *J. Biol. Chem.,* 279: 10564-10574 (2004). **(IMG-305A)**

4. Evidence of Toll-like receptor molecules on human platelets. Fabrice Cognasse, Hind Hamzeh, Patricia Chavarin, Sophie Acquart, Christian Genin and Olivier Garraud. *Immunology and Cell Biology*. Volume 83 Issue 2 Page 196 - April 2005. doi:10.1111/j.1440-1711.2005.01314.x **(IMG-305A)**
5. The Unc93b1 mutation 3d disrupts exogenous antigen presentation and signaling via Toll-like receptors 3, 7 and 9. Koichi Tabeta, Kasper Hoebe, Edith M Janssen, Xin Du, Philippe Georgel, Karine Crozat, Suzanne Mudd, Navjiwan Mann, Sosathya Sovath, Jason Goode, Louis Shamel, Anat A, et al. *Nature Immunology* 7, 156-164 (2006). **(IMG-305A)**
6. Novel Toll-Like Receptor 9 Agonist Induces Epidermal Growth Factor Receptor (EGFR) Inhibition and Synergistic Antitumor Activity with EGFR Inhibitors. Vincenzo Damiano, Rosa Caputo, Roberto Bianco, Francesco P. D'Armiento, Antonio Leonardi, Sabino De Placido, A. Raffaele Bianco, Sudhir Agrawal, Fortunato Ciardiello, and Giampaolo Tortora. *Clin. Cancer Res.*, 12: 577-583 (2006). **(IMG-305A)**
7. Intracellular Signaling Mechanisms Regulating Toll-Like Receptor-Mediated Activation of Eosinophils. Wong CK, PFY Cheung, WK IP and CWK Lam. *Am. J. Respir. Cell Mol. Biol.*doi:10.1165/rcmb.2006-0457OC (2007), in press. **Imgenex antibodies cited (human blood eosinophils and neutrophils from buffy coat): For WB, Fig. 1A: TLR1 (IMG-5012), TLR5 (IMG-664), TLR6 (IMG-304A), TLR7 (IMG-540), TLR8 (IMG-321A), TLR9 (IMG-305A). For Flow (Intracellular) and Flow (Surface), Fig. 1B: TLR1 (IMG-5021), TLR2 (IMG-416C), TLR3 (IMG-315C), TLR4 (IMG-417C), TLR5 (IMG-663C), TLR6 (IMG-304C), TLR7 (IMG-665A), TLR8 (IMG-321C), TLR9 (IMG-305C).**
8. Toll-like receptor 9 expression in murine and human adrenal glands and possible implications during inflammation. Tran N, A Koch, R Berkels, O Boehm, PA Zacharowski, G Baumgarten, P Knuefermann, M Schott, W Kanczkowski, SR Bornstein, SL LIghtman, and K Zacharowski. *J Clin Endocrin Metab.* Doi:10.1210/jc.2006-2697 In press (2007). **Imgenex antibodies cited (mouse spleen and adrenal tisse, mouse RAW264.7 macrophage cell line, human adrenal tissue: TLR9 [(IMG-305A) IHC (paraffin): Figs 1C-D, F and 6; IF/ICC: Figs 1E and 5]; TLR9 [(IMG-431) WB: Figs 1B, 3C, and 5G]. The TLR9 IMG-431 antibody was validated by WB using adrenal gland tissue from TLR9-/- and wt mice (Fig 1B).**
9. Deoxycytidyl-deoxyguanosine oligonucleotide classes A, B, and C induce distinct cytokine gene expression patterns in Rhesus monkey peripheral blood mononuclear cells and distinct alpha interferon responses in TLR9-expressing Rhesus monkey plasmacytoid dendritic cells. Abel K, Y Wang, L Fritts, E Sanchez, E Chung, P Fitzgerald-Bocarsly, AM Krieg, and CJ Miller. *Clinical and Diagnostic Laboratory Immunology* 12:606-621 (2005). **Imgenex antibodies cited: IMG-305C [Flow (Intracellular), Fig. 5] on Rhesus monkey spleen cell suspensions and PBMC.**
10. Toll-like receptors in cellular subsets of human tonsil T cells: altered expression during recurrent tonsillitis. Mansson A, M Adner and LO Cardell. *Respiratory Resesarch* doi:10.1186/1465-9921-7-36. (2006). **Imgenex antibodies cited (human tonsils separated into cell subtypes): 1. TLR3 [IMG-315D (Flow-Intracellular), Figs 5 and 6]. 2. TLR5 [IMG-663A (Flow-Intracellular), Fig 6]. 3. TLR9 [IMG-305C (Flow-Intracellular), Fig 4.] .**
11. Maintenance of colonic homeostasis by distinctive apical TLR9 signaling in intestinal epithelial cells. Lee J., J-H Mo, K. Katakura, I. Alkalay, A. N. Rucker, Y-T. Liu, H-K. Lee, C. Shen, G. Cojocaru, S. Shenouda, M. Kagnoff, L. Eckmann, Y. Ben-Neriah, and E. Raz., *Nature Cell Biol.,* 8, doi:10.1038/ncb1500 (2006). **Imgenex antibodies cited: 1. TLR9 (IMG-305) [Confocal Microscopy, Fig.2 (intestinal epithelial cells)]. [Flow (cell surface), Fig.S1 (293-HEK cells) and Fig.S2 (Caco-2 intestinal epithelial cells)].**
12. Role of pathogenic auto-antibody production by Toll-like receptor 9 of B cells in active systemic lupus erythematosus. Nakano S, S Morimoto, J Suzuki, K Nozawa, H Amano, Y Tokano, Y Takasaki. *Rheumatology* 47: 145-149 (2008). **Imgenex antibody cited: IMG-305C (TLR9-FITC) for Flow (Intracellular), human peripheral blood B cells from normal and SLE patients, Figs 1C, 2, 3.**
13. Induction of pro-inflammatory programs in enteroendocrine cells by the Toll-like receptor agonists flagellin and bacterial LPS. Selleri S, Palazzo M, Deola S, Wang E, Balsari A, Marincola F, Rumio C. *International Immunology* doi:10.1093/intimm/dxn055 (2008). **TLR9-FITC (IMG-305C): Flow (intracellular), Human colon neuroendocrine LCC-18 cell line: Fig. 4d.**
14.

Molecular cloning and characterization of equine Toll-like receptor 9. Zhang YW, EG Davis, F Blecha, MJ Wilkerson. Veterinary Immunology and Immunopathology 124: 208-219 (2008)..

Imgenex Products cited for Flow (Cell Surface) and Flow (Intracellular):.

IMG-305C (TLR9-FITC) and IMG-305D (TLR9-PE): Fig 2B (HEK293 and equine TLR9 transfected cells), Fig 4 (equine leukocytes), Fig 5 (equine PHA-stimulated PBMC), Fig 6 (equine leukocyte subsets). .

Notes: TLR9 expression was found to be predominantly intracellular. HEK293 cells express endogenous TLR9. TLR9 expression increased in equine TLR9 transiently transfected HEK293 cells. TLR9 expression increased in PBMC cells following PHA stimulation.

15. Inhibitors of TLR8 reduce TNF production from human rheumatoid synovial membrane cultures. Sacre S, A Lo, B Gregory, R Simmonds, L Williams, M Feldmann, F Brennan, B Foxwell. *J Immunol* 181: 8002-8009 (2008). **Imgenex antibodies cited [Flow (intracellular), human synovial membrane cells, Fig. 4B]:**
1. TLR3-FITC (IMG-315C)
2. TLR8-FITC (IMG-321C)
3. TLR9-FITC (IMG-305C).