

Toll-Like Receptor(TLR) : Unique Antibody from Imgenex

Toll-like receptor (TLR) family is a phylogenetically conserved mediator of innate immunity that is essential for microbial recognition. TLRs are evolutionarily conserved and their congeners have been found in insects, plants, and mammals. Drosophila Toll (dToll) was the first member of the TLR family to be identified, and was initially characterized as a developmental protein governing the formation of the dorsal-ventral axis in Drosophila. Mammalian TLRs represent a growing family of transmembrane proteins characterized by multiple copies of leucine-rich repeats (LRRs) in the extracellular domain and a cytoplasmic Toll/IL-1R (TIR) motif and therefore, TLRs are thought to belong to the IL-1R superfamily. Recently, TLRs were observed to influence the development of adaptive immune responses, presumably by activating antigen-presenting cells. To sense innumerable and various pathogenic threats, TLRs have evolved to recognize pathogen-associated molecular patterns (PAMPs), which represent molecular features on the surface of pathogens. Each TLR binds to a variety of PAMPs that work as molecular markers of potential pathogens that the host shall be defended against. So far, 11 members of the TLR family (TLR1-TLR11) have been identified in mammals. TLR1, TLR2, TLR6, TLR4, and TLR5 are located on the plasma membrane, whereas TLR3, TLR7, and TLR9 are not located on the cell surface. TLR2 is involved in the responses to a variety of bacterial components that include peptidoglycan, lipoproteins/ lipopeptides, glycosyl-phosphatidylinositol anchors from *Trypanosoma cruzi*, and zymosan. Flagellin, a potent pro-inflammatory inducer, is recognized by TLR5. TLR3 recognizes dsRNA, a viral product, whereas TLR9 recognizes unmethylated CpG motifs frequently found in the genome of bacteria and viruses, but not vertebrates. TLR7 recognizes the pharmaceutical compounds imiquimod (also known as Aldara, R-837 or S-26308) and resiquimod (also known as R-848 or S-28463). It has recently been shown that TLR11, which is abundant in the kidney and bladder, senses uropathogenic bacteria. They are usually classified into three subgroups.. Members of subgroup 1 bind interleukins that are produced by macrophages, monocytes and dendritic cells and all have Immunoglobulin (Ig) domains. Members of subgroup 2 bind directly pathogen-associated molecules (LPS, peptidoglycan etc.). A third subgroup consists of adaptor proteins that are exclusively cytosolic. The toll-like receptor (TLR) signaling pathway is the front-line subsystem against invasive microorganisms for both innate and adaptive immunity and has been evolutionarily well conserved in both invertebrates and vertebrates.

Reference:

1. A comprehensive map of the toll-like receptor signaling network. Molecular Systems Biology Article number: 2006.0015 . Kanae Oda & Hiroaki Kitano
2. Toll-like receptor downstream signaling Taro Kawai and Shizuo Akira Arthritis Res Ther. 2005; 7(1): 12–19.
3. A Toll-like receptor recognizes bacterial DNA Nature 408, 740-745 (7 December 2000) Hiroaki Hemmi, Osamu Takeuchi, Taro Kawai, Tsuneyasu Kaisho, Shintaro Sato, Hideki Sanjo, Makoto Matsumoto, Katsuaki Hoshino, Hermann Wagner, Kiyoshi Takeda and Shizuo Akira.

About the Author

IMGENEX India Pvt Ltd. the only biotech company in Orissa and one of its kinds in Eastern India. IMGENEX India started in Oct as an outsourcing branch of [IMGENEX Corporation](#), San Diego, USA. Find out more information about [Toll-like Receptor](#).

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