INNATE IMMUNITY

PRR LIGANDS



The most comprehensive library of PAMPs

- Largest collection of PRR agonists and antagonists
- Highest quality ligands
- Activity and contaminant levels thoroughly tested

Pattern recognition receptors (PRRs) recognize a wide variety of ligands, called pathogen-associated molecular patterns (PAMPs), discriminating bacteria, fungi and other pathogens. InvivoGen offers the most comprehensive choice of ligands known to activate specific PRRs. InvivoGen strives to provide PRR ligands of the highest quality by thoroughly validating our ligands to ensure lot-to-lot reproducibility.

Choose from our extensive collection:

- TLR Ligands
- NLR Ligands
- RLR Ligands
- CLR Ligands
- CDS/STING Ligands
- Inflammasome Inducers
- Microbiota Ligands
- Multi-PRR Ligands

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www.invivogen.com +33 (5)62 71 69 39 +33 (5)62 71 69 30 info.eu@invivogen.com

PRR LIGANDS

The innate immune system is an evolutionarily conserved system acting as a first-line of defense against invading microbial pathogens and other potential threats to the host. A range of pattern recognition receptors (PRRs) recognize specific pathogen-associated molecular patterns (PAMPs) exclusively present on microbes such as bacteria, fungi, parasites, and viruses. The main PRR families of the innate immune system are the Toll-Like receptors (TLRs), NOD-Like receptors (NLRs), C-type lectin receptors (CLRs), RIG-I-Like receptors (RLRs), cytosolic DNA sensors (CDS), and the aryl hydrocarbon receptor (AhR). InvivoGen offers a comprehensive range of high quality PAMPs known to activate these PRRs.

TLR LIGANDS

TLR2 Agonists

TLR2 (also known as CD282) is a membrane surface receptor involved in the recognition of a wide array of microbial molecules. These molecules represent broad groups of species, such as Gram-positive and Gram-negative bacteria, as well as mycoplasma and yeast. They include peptidoglycan, lipoteichoic acid, and lipoproteins from bacteria, lipoarabinomannan from mycobacteria, and zymosan from yeast cell walls. The variety of TLR2 ligands is the greatest among all the TLRs and this is due to the heterodimerization needed for TLR2-mediated responses. TLR2 forms a heterodimer with TLR6 to recognize diacylated lipoproteins, whereas the TLR1/TLR2 heterodimer binds triacylated lipoproteins. Moreover, the CD14 co-receptor enhances pathogen recognition by TLR2. TLR2 signaling is MyD88 (myeloid differentiation primary-response protein 88)-dependent and requires the adaptor molecule TIRAP (TIR-associated protein) to induce the production of pro-inflammatory cytokines following AP-1 (activator protein 1) and NF-κB (nuclear factor-κB) nuclear translocation.

TLR3 Agonists

TLR3 (also known as CD283) is an endosomal receptor that recognizes double-stranded RNA (dsRNA), a molecular pattern associated with viral infection. Polyinosine-polycytidylic acid (poly(I:C)), a synthetic analog of dsRNA, is the ligand of choice for TLR3. TLR3 signals mainly through a MyD88-independent pathway involving the adapter protein TRIF (TIR domain-containing adaptor protein-inducing IFN-β). Phosphorylation of IRF3 (IFN regulatory factor 3) leads to the production of IFN-β (interferon β) with the subsequent activation of IFN-stimulated response elements (ISRE). Additionally, TLR3 signaling leads to the nuclear translocation of AP-1 and NF-kB and to the production of pro-inflammatory cytokines.

TLR4 Agonists

TLR4 is the receptor for Gram-negative lipopolysaccharide (LPS) and lipid A, its toxic moiety. In order to respond to LPS, TLR4 interacts with three different extracellular proteins: LPS binding protein (LBP), CD14 and myeloid differentiation protein 2 (MD-2). TLR4 signaling comprises two pathways: the MyD88-dependent and MyD88-independent pathways. The MyD88-dependent pathway involves AP-1 and NF-κB nuclear translocation and leads to the production of inflammatory cytokines. The MyD88-independent pathway activates IRF3 and involves another adaptor molecule, TRAM (TRIF-related adaptor molecule), and leads to the production of IFN-β and the expression of IFN-inducible genes through the activation of IRF3.

TLR5 Agonists

The cell surface receptor TLR5 recognizes flagellin, the major component of the bacterial flagellar filament, from both Gram-positive and Gram-negative bacteria. Activation of TLR5 stimulates the production of pro-inflammatory cytokines through signaling via the adaptor protein MyD88. As a homodimer, TLR5 can generate a pro-inflammatory signal, suggesting that it might be the only TLR participating in flagellin recognition.

TLR7/8 Agonists

TLR7 and TLR8 are endosomal receptors involved in the response to viral infection. They recognize GU-rich short single-stranded RNA, as well as small synthetic molecules, such as imidazoquinolines and nucleoside analogues. TLR7/TLR8 signaling is MyD88-dependent and is mediated by the nuclear translocation of AP-1 and NF-κB, in addition to the phosphorylation of IRF7 (IFN regulatory factor 7). IRF7 promotes the induction of ISRE and the subsequent expression of type I IFN genes, whereas AP-1 and NF-κB activation results in the production of pro-inflammatory cytokines.

TLR9 Agonists

The endosomal receptor TLR9 (also known as CD289) recognizes specific unmethylated CpG-ODN sequences that distinguish microbial DNA from mammalian DNA. Three types of stimulatory ODNs have been described: Class A (Type D), Class B (Type K) and Class C. Similar to most other TLRs, TLR9 signaling is MyD88-dependent, involving the transciption factors AP-1, NF-κB, and IRF7. TLR9-induced pro-inflammatory cytokine production is mediated by AP-1 and NF-κB, whereas TLR9-induced IFN-α/β production is mediated by IRF7. The cytokine and IFN response is highly dependent on the class of CpG-ODN used to stimulate TLR9.

NLR LIGANDS

NOD1/2 Agonists

NOD1 (also known as CARD4) and NOD2 (also known as CARD15) are intracellular PRRs that sense bacterial peptidoglycans (PGNs). NOD1 senses the D-γ-glutamyl-meso-DAP dipeptide (iE-DAP), which is found in PGNs of all Gram-negative and certain Gram-positive bacteria, whereas NOD2 recognizes the muramyl dipeptide (MDP) structure found in almost all bacteria. Both iE-DAP and MDP must be delivered intracellularly either by bacteria that invade the cell or through other cellular uptake mechanisms. Ligand-bound NOD1 and NOD2 oligomerize and signal via the serine/threonine RIP2 kinase. Once activated, RIP2 mediates ubiquitination of NEMO/IKKγ leading to the activation of NF-κB and the production of inflammatory cytokines.

INFLAMMASOME INDUCERS

Inflammasomes are multimeric protein complexes that are generally comprised of a member of the NLR family, such as NLRP3 and NLRC4, the adaptor protein ASC (apoptosis-associated speck-like protein with a CARD) and pro-caspase-1. They assemble in the cytoplasm of innate immune cells in response to cytosolic PAMPs or DAMPs (danger-associated molecular patterns). They promote the secretion of the pro-inflammatory cytokines IL-1β and IL-18 and cause a rapid and pro-inflammatory form of cell death called pyroptosis. The most intensely studied inflammasome is the NLRP3 (NLR family, pyrin domain containing 3) inflammasome. It is activated by a broad variety of stimuli, including danger signals (e.g. ATP), crystalline substances (e.g. MSU) and microbial toxins (e.g. nigericin). The NLRC4 (NLR containing a caspase activating and recruitment domain 4) / NAIP (neuronal apoptosis inhibitory protein) inflammasome is triggered by cytosolic flagellin from various bacteria, such as Salmonella typhimurium and Pseudomonas aeruginosa. The NLRP1 inflammasome induces caspase-1 in response to diverse stimuli, including Bacillus anthracis lethal toxin, Toxoplasma gondii, muramyl dipeptide, and host intracellular ATP depletion.

RLR LIGANDS

RIG-I/MDA-5 Agonists

RIG-I and MDA-5 are cytoplasmic RNA helicases that recognize intracellular double-stranded RNA (dsRNA), a molecular pattern associated with viral infection. Despite their overall structural similarity, they detect distinct viral species. RIG-I participates in the recognition of Paramyxoviruses (Newcastle disease virus (NDV), Sendai virus (SeV)), Rhabdoviruses (vesicular stomatitis virus (VSV)), Flaviviruses (hepatitis C (HCV)) and Orthomyxoviruses (Influenza), whereas MDA-5 is essential for the recognition of Picornaviruses (encephalo-myocarditis virus (EMCV)) and poly(I:C), a synthetic analog of viral dsRNA. Although RIG-I and MDA-5 recognize different ligands, they share common signaling features. Upon recognition of dsRNA, they are recruited by the adaptor IPS-1 (also known as MAVS, CARDIF or VISA) to the outer membrane of the mitochondria, leading to the activation of several transcription factors including IRF3, IRF7 and NF-κB. IRF3 and IRF7 control expression of type I IFNs, while NF-κB regulates the production of pro-inflammatory cytokines.

CLR LIGANDS

Dectin-1 Agonists

Dectin-1 is a member of the C-type lectin receptor (CLR) family and plays an important role in antifungal innate immunity. Dectin-1 is a specific transmembrane receptor of b-glucans, which are glucose polymers found in the cell walls of fungi, including the yeasts Saccharomyces cerevisiae and Candida albicans. Upon binding to its ligand, Dectin-1 triggers phagocytosis and signaling through the kinase Syk and the adaptors CARD9-Bcl10-Malt1, leading to the production of reactive oxygen species (ROS), the activation of NF-κB and the subsequent production of pro-inflammatory cytokines. Dectin-1 and TLR2 work in tandem to enhance their respective signaling responses.

Dectin-2 Agonists

Dectin-2 is a type II transmembrane CLR that binds high mannose-type carbohydrates and was shown to be the functional receptor for α-mannans. Upon binding to its ligand, Dectin-2 signals through the kinase Syk and the adaptors CARD9/Bcl-10/MALT1 triggering the activation of NF-κB and the subsequent production of pro-inflammatory cytokines. Dectin-2 is implicated in anti-bacterial immunity and allergy.

Mincle Agonists

Mincle is a multi-functional danger receptor that recognizes a wide variety of ligands such as damaged cells, fungus, yeast and mycobacteria. Exogenous ligands for Mincle include fungal α-mannose, and the mycobacterial glycolipid, trehalose-6'6'-dimycolate (TDM; also known as cord factor) the immunostimulatory component of Mycobacterium tuberculosis. Furthermore, Mincle senses damaged cells by recognizing endogenous DAMPs. One such DAMP identified is the spliceosome-associated protein 130 (SAP130), a soluble factor released by necrotic cells. Mincle triggers signaling through Syk leading to CARD9-dependent NF-κB activation. Syk induces also the mobilization of intracellular calcium (Ca2+) and the activation of the calcineurin-NFAT pathway.

CDS & STING LIGANDS

Cytosolic DNA Sensor (CDS) Agonists

CDSs detect damaged, mislocalized or pathogenic DNA, typically inducing type I IFN production through the TBK1-IRF3 pathway. DNA is normally compartmentalized in the nucleus or mitochondria; however, if it is not processed or transported correctly, then it can accumulate in the cytosol. Alternatively, viral or microbial DNA can enter the cytosol of host cells upon infection. Several CDSs have been identified, including the adenosine deaminase DAI, the helicase DDX41, the IFN-inducible IFI16 protein, and cGAS (cyclic GMP-AMP synthase). AIM2 is another cytosolic DNA sensor, which upon activation forms an inflammasome that leads to the secretion of IL-1β.

STING Agonists

STING, initially thought to serve solely as an adaptor protein for mediating signaling by CDSs, was found to be a direct sensor of cyclic dinucleotides (CDNs). CDNs are important messengers in bacteria, affecting numerous responses of the prokaryotic cell, as well as in mammalian cells, acting as drivers of the innate immune response. CDNs and xanthenone derivatives, such as DMXAA, bind to and activate STING, leading to a potent type I IFN response in a TBK1-IRF3-dependent manner.

AHR LIGANDS

AhR Agonists

The aryl hydrocarbon receptor (AhR) is a ligand-dependent transcriptional factor capable of sensing a wide range of structurally different exogenous and endogenous molecules. AhR ligands vary in their structure, and their binding affinity can significantly differ between mouse and human AhR. AhR agonists have been found to arise from xenobiotics such as polluants, and indoles mainly derived from tryptophan metabolism occurring in the stomach and in the gut, as well as in other organs upon photo-oxidation or oxidative stress.

TLR LIGANDS

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***GRADE**

To ensure the absence of bacterial contaminants (i.e. lipoproteins and endotoxins), TLR2 and TLR4 activation has been assessed by cellular assays.

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
TLR2 AGONISTS				
CU-T12-9	Synthetic TLR2-TLR1 compound	TLR2 +/ TLR4 -	10mg	tlrl-cut129
CL401 VacciGrade™	Preclinical grade CL401	VacciGrade™	5 mg	vac-c401-5
CL413 - Adilipoline™	PAM2CK4-conjugated hydroxyadenine compound	TLR2 +/ TLR4 -	500 µg	tlrl-c413
CL413 VacciGrade™	Preclinical grade CL413	VacciGrade™	5 mg	vac-c413-5
CL429	Pam2C-conjugated murabutide	TLR2 +/ TLR4 -	5 mg	tlrl-c429
CL429 VacciGrade™	Preclinical grade CL429	VacciGrade™	5 mg	vac-c429
FSL-1	Synthetic diacylated lipoprotein - TLR2/6	TLR2 +/ TLR4 -	100 µg	tlrl-fsl
HKEB	Heat Killed Escherichia coli 0111:B4	TLR2 +/ TLR4 +	10^{10} cells	tlrl-hkeb
HKLM	Heat Killed Listeria monocytogenes	TLR2 +/ TLR4 -	10^{10} cells	tlrl-hklm
HKMT	Heat Killed Mycobacterium tuberculosis	TLR2 +/ TLR4 -	10 mg *	tlrl-hkmt-1
HKPA	Heat Killed Pseudomonas aeruginosa	TLR2 +/ TLR4 -	10^{10} cells	tlrl-hkpa
HKSA	Heat Killed Staphylococcus aureus	TLR2 +/ TLR4 -	10^{10} cells	tlrl-hksa
HKSP	Heat Killed Streptococcus pneumoniae	TLR2 +/ TLR4 -	10^{10} cells	tlrl-hksp
HKST	Heat Killed Salmonella typhimurium	TLR2 +/ TLR4 +	10^{10} cells	tlrl-hkst
LPS-PG	Standard Lipopolysaccharide from P. gingivalis	TLR2 +/ TLR4 +	1 mg	tlrl-pglps
LTA-SA Purified	Purified lipoteichoic acid from S. aureus	TLR2 +/ TLR4 -	5 mg	tlrl-pslta
Pam2CSK4	Synthetic diacylated lipoprotein - TLR2(6)	TLR2 +/ TLR4 -	1 mg	tlrl-pm2s-1
Pam3CSK4	Synthetic triacylated lipoprotein - TLR1/2	TLR2 +/ TLR4 -	1 mg	tlrl-pms
Pam3CSK4 Biotin	Biotinylated Pam3CSK4	TLR2 +/ TLR4 -	50 µg	tlrl-bpms
Pam3CSK4 VacciGrade™	Preclinical grade Pam3CSK4	VacciGrade™	1 mg	vac-pms
PGN-BS	Peptidoglycan from B. subtilis	TLR2 +/ TLR4 -	5 mg	tlrl-pgnb3
PGN-EK	Peptidoglycan from E. coli K12	TLR2 +/ TLR4 +	1 mg	tlrl-pgnek
PGN-SA	Peptidoglycan from S. aureus	TLR2 +/ TLR4 -	5 mg	tlrl-pgns2
Zymosan	Cell wall preparation of S. cerevisiae	TLR2 +/ TLR4 -	100 mg	tlrl-zyn
TLR3 AGONISTS				
NexaVant™	Synthetic double stranded RNA		100 µg*	tlrl-nvt
NexaVant™ VacciGrade™	Synthetic double stranded RNA | Th1 response	VacciGrade™	100 µg*	vac-nvt
Poly(A:U)	Polyadenylic-polyuridylic acid	TLR2 -/ TLR4 -	10 mg	tlrl-pau
Poly(I:C) (HMW)	Polyinosine-polycytidylic acid. High molecular weight (1.5-8 kb)	TLR2 -/ TLR4 -	10 mg	tlrl-pic
Poly(I:C) (HMW) Biotin	Biotinylated poly(I:C) (HMW)	TLR2 -/ TLR4 -	10 µg	tlrl-picb
Poly(I:C) (HMW) Fluorescein	Fluorescein-labeled poly(I:C) (HMW)	TLR2 -/ TLR4 -	10 µg	tlrl-picf
Poly(I:C) (HMW) Rhodamine	Rhodamine-labeled poly(I:C) (HMW)	TLR2 -/ TLR4 -	10 µg	tlrl-picr
Poly(I:C) (HMW) VacciGrade™	Preclinical grade poly(I:C) (HMW)	VacciGrade™	10 mg	vac-pic
Poly(I:C) (LMW)	Polyinosine-polycytidylic acid. Low molecular weight (0.2-1 kb)	TLR2 - /TLR4 -	25 mg	tlrl-picw
Poly(I:C) (LMW) Rhodamine	Rhodamine-labeled poly(I:C) (LMW)	TLR2 - /TLR4 -	10 µg	tlrl-piwr
Poly(I:C) (HMW) Cy3	Cy3-labeled poly(I:C) (HMW)		10 µg*	tlrl-piccy3
Poly(I:C) (HMW) Cy5	Cy5-labeled poly(I:C) (HMW)		10 µg*	tlrl-piccy5

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
TLR4 AGONISTS				
CRX-527	Synthetic Lipid A analog	TLR2 - /TLR4 +	1 mg	tlrl-crx527
LPS-B5	Standard lipopolysaccharide from E. coli 055:B5	TLR2 + /TLR4 +	5 mg	tlrl-b5lps
LPS-B5 Ultrapure	Ultrapure lipopolysaccharide from E. coli 055:B5	TLR2 - /TLR4 +	5 mg	tlrl-pb5lps
LPS-EB	Standard lipopolysaccharide from E. coli 0111:B4	TLR2 + /TLR4 +	5 mg	tlrl-eblps
LPS-EB Biotin	Biotinylated ultrapure LPS from E. coli 0111:B4	TLR2 + /TLR4 +	500 µg	tlrl-lpsbiot
LPS-EB Ultrapure	Ultrapure lipopolysaccharide from E. coli 0111:B4	TLR2 - /TLR4 +	$5x10^6$ EU	tlrl-3pelps
LPS-EB VacciGrade™	Preclinical grade ultrapure LPS from E. coli 0111:B4	VacciGrade™	$5x10^6$ EU	vac-3pelps
LPS-EK	Standard lipopolysaccharide from E. coli K12	TLR2 + /TLR4 +	5 mg	tlrl-eklps
LPS-EK Ultrapure	Ultrapure lipopolysaccharide from E. coli K12	TLR2 - /TLR4 +	1 mg	tlrl-peklps
LPS-PG	Standard lipopolysaccharide from P. gingivalis	TLR2 + /TLR4 +	1 mg	tlrl-pglps
LPS-PG Ultrapure	Ultrapure lipopolysaccharide from P. gingivalis	TLR2 - /TLR4 +	1 mg	tlrl-ppglps
LPS-SM Ultrapure	Ultrapure lipopolysaccharide from S. minnesota	TLR2 - /TLR4 +	5 mg	tlrl-smlps
MPLA-SM*	Monophosphoryl lipid A from S. minnesota	TLR2 - /TLR4 +	1 mg	tlrl-mpla2
MPLA-SM* VacciGrade™	Preclinical grade detoxified MPLA	VacciGrade™	1 mg	vac-mpla2
MPLA Synthetic	Synthetic monophosphoryl lipid A	TLR2 - /TLR4 +	1 mg	tlrl-mpls
MPLA Synthetic VacciGrade™	Preclinical grade synthetic MPLA	VacciGrade™	1 mg	vac-mpls
TLR4 ANTAGONISTS				
LPS-RS	Lipopolysaccharide from Rhodobacter sphaeroides	TLR2 + /TLR4 -	5 mg	tlrl-rslps
LPS-RS Ultrapure	Ultrapure lipopolysaccharide from R. sphaeroides	TLR2 - /TLR4 -	1 mg	tlrl-prslps
TLR5 AGONISTS				
FLA-BS	Standard flagellin from B. subtilis - 10% pure	TLR2 + /TLR4 +	100 µg	tlrl-bsfla
FLA-BS Ultrapure	Ultrapure flagellin from B. subtilis - >95% pure	TLR2 - /TLR4 -	50 µg	tlrl-pbsfla
FLA-PA Ultrapure	Ultrapure flagellin from P. aeruginosa - >95% pure	TLR2 - /TLR4 -	50 µg	tlrl-pafla
FLA-ST	Standard flagellin from S. typhimurium - 10% pure	TLR2 + /TLR4 +	100 µg	tlrl-stfla
FLA-ST Ultrapure	Ultrapure flagellin from S. typhimurium - >95% pure	TLR2 - /TLR4 -	10 µg *	tlrl-epstfla
RecFLA-ST	Recombinant flagellin from S. typhimurium	TLR2 - /TLR4 -	10 µg *	tlrl-flic-10
Flagellin Flic VacciGrade™	Preclinical grade RecFLA-ST	VacciGrade™	50 µg	vac-fla
TLR5 ANTAGONISTS				
hTLR5-Fc	Soluble ectodomain of TLR5	TLR2 - /TLR4 -	50 µg	fc-htlr5
TLR7 AGONISTS				
CL264	Adenine analog	TLR2 - /TLR4 -	500 µg *	tlrl-c264e
CL307	Hydroxyadenine spermine compound	TLR2 - /TLR4 -	500 µg	tlrl-c307
CL401 VacciGrade™	Preclinical grade CL401	VacciGrade™	1 mg	vac-c401-5
CL413 - Adilipoline™	PAM2CK4-conjugated hydroxyadenine compound	TLR2 + /TLR4 -	500 µg	tlrl-c413
CL413 VacciGrade™	Preclinical grade CL413	VacciGrade™	5 mg	vac-c413-5
Gardiquimod™	Imidazoquinoline compound	TLR2 -/ TLR4 -	500 µg *	tlrl-gdqs
Imiquimod (R837)	Imidazoquinoline compound	TLR2 -/ TLR4 -	500 µg *	tlrl-imqs
Imiquimod VacciGrade™	Preclinical grade Imiquimod	TLR2 -/ TLR4 -	5 mg	vac-imq
Loxoribine	Guanosine analog	TLR2 -/ TLR4 -	50 mg	tlrl-lox

** Available different quantities*

TLR LIGANDS

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PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
CONJUGATABLE TLR7 LIGANDS				
TL7-887	TLR7 agonist with a maleimide group	VacciGrade™	250 µg *	vac-tl7887
TL7-975	TLR7 agonist with an azido group	VacciGrade™	250 µg *	vac-tl7975
TLR8 AGONISTS				
ORN06/LyoVec™	ssRNA with 6 UUGU repeats / LyoVec™	TLR2 -/ TLR4 -	4 x 25 µg	tlrl-orn6
ssPolyU Naked	RNA homopolymer	TLR2 -/ TLR4 -	10 mg *	tlrl-sspu
ssPolyU/LyoVec™	RNA homopolymer / LyoVec™	TLR2 -/ TLR4 -	4 x 25 µg	tlrl-lpu
ssRNA40/LyoVec™	HIV-1 LTR-derived ssRNA / LyoVec™	TLR2 -/ TLR4 -	4 x 25 µg	tlrl-lrna40
ssRNA41/LyoVec™	ssRNA40 control / LyoVec™	TLR2 -/ TLR4 -	4 x 25 µg	tlrl-lrna41
TL8-506	Benzoazepine analog	TLR2 -/ TLR4 -	500 µg	tlrl-tl8506
TLR8 ANTAGONISTS				
CU-CPT9a	Potent and selective TLR8 inhibitor	TLR2 -/ TLR4 -	10 mg	inh-cc9a
TLR7/8 AGONISTS				
CL075	Thiazoquinoline compound	TLR2 -/ TLR4 -	500 µg *	tlrl-c75
CL097	Imidazoquinoline compound	TLR2 -/ TLR4 -	500 µg *	tlrl-c97
R848 (resiquimod)	Imidazoquinoline compound	TLR2 -/ TLR4 -	500 µg *	tlrl-r848
R848 VacciGrade™	Preclinical grade R848	VacciGrade™	5 mg	vac-r848
TLR7/8 ANTAGONISTS				
BMS-986256 (Afimetoran)	Indole compound	InvitroFit™	2 mg	inh-afi
M5049 (Enpatoran)	Quinoline compound	InvitroFit™	5 mg *	inh-m5049
TLR9 AGONISTS				
E. coli ssDNA/LyoVec™	E. coli single stranded DNA/LyoVec™ complexes	TLR2 -/ TLR4 -	200 µg	tlrl-ssec
dsDNA-EC	E. coli K12 genomic DNA	TLR2 -/ TLR4 -	200 µg	tlrl-ecdna
ODN 1018 VacciGrade™	Stimulatory CpG ODN Type B Human / mouse	VacciGrade™	1 mg	vac-1018-1
ODN 1585	Stimulatory CpG ODN Type A Mouse specific	TLR2 -/ TLR4 -	200 µg *	tlrl-1585
ODN 1585 VacciGrade™	Preclinical grade ODN 1585	VacciGrade™	1 mg	vac-1585-1
ODN 1668	Stimulatory CpG ODN Type B Mouse specific	TLR2 -/ TLR4 -	200 µg *	tlrl-1668
ODN 1826	Stimulatory CpG ODN Type B Mouse specific	TLR2 -/ TLR4 -	200 µg *	tlrl-1826
ODN 1826 control (ODN 2138)	Negative control for ODN 1826	TLR2 -/ TLR4 -	1 mg	tlrl-1826c-1
ODN 1826 Biotin	Biotinylated CpG ODN - mouse specific, type B	TLR2 -/ TLR4 -	2 x 50 µg	tlrl-1826b
ODN 1826 FITC	FITC-labeled CpG ODN - mouse specific, type B	TLR2 -/ TLR4 -	50 µg	tlrl-1826f
ODN 1826 VacciGrade™	Preclinical grade ODN 1826	VacciGrade™	1 mg	vac-1826-1
ODN 2006 (ODN7909)	Stimulatory CpG ODN Type B Human specifc	TLR2 -/ TLR4 -	200 µg *	tlrl-2006
ODN 2006 control (ODN 2137)	Negative control for ODN 2006	TLR2 -/ TLR4 -	1 mg	tlrl-2006c-1
ODN 2006 Biotin	Biotinylated CpG ODN - human specific, type B	TLR2 -/ TLR4 -	2 x 50 µg	tlrl-2006b
ODN 2006 FITC	FITC-labeled CpG ODN - human specific, type B	TLR2 -/ TLR4 -	50 µg	tlrl-2006f
ODN 2006-G5	Stimulatory CpG ODN Type B Human specific	TLR2 -/ TLR4 -	200 µg *	tlrl-2006g5
ODN 2006 VacciGrade™	Preclinical grade ODN 2006	VacciGrade™	1 mg	vac-2006-1
ODN 2007	Stimulatory CpG ODN Type B Bovine / porcine	TLR2 -/ TLR4 -	1 mg *	tlrl-2007-1
ODN 2216	Stimulatory CpG ODN Type A Human specific	TLR2 -/ TLR4 -	200 µg *	tlrl-2216

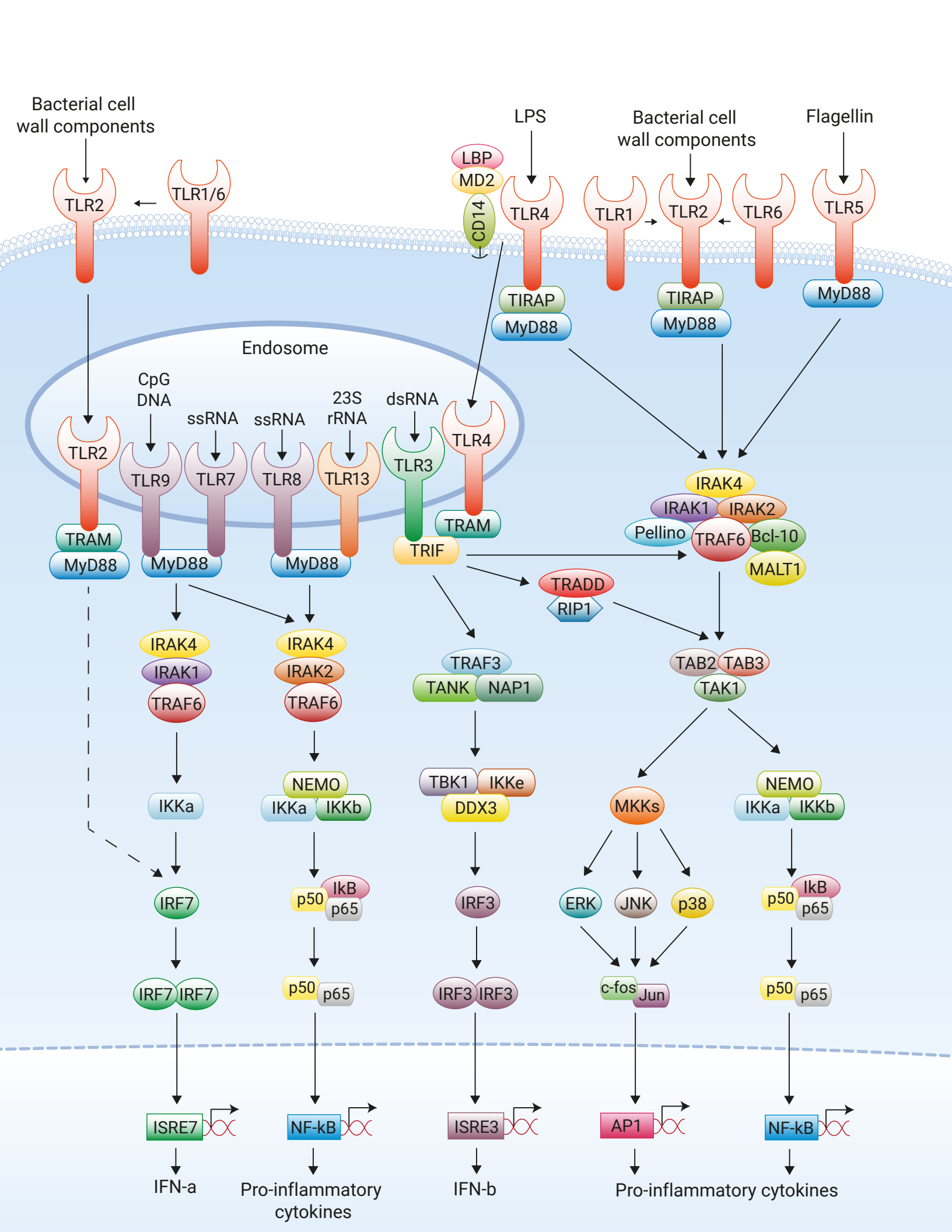
PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
ODN 2216 control (ODN 2243)	Negative control for ODN 2216	TLR2 -/ TLR4 -	1 mg	tlrl-2243-1
ODN 2216 Biotin	Biotinylated CpG ODN - human specific, type A	TLR2 -/ TLR4 -	2 x 50 µg	tlrl-2216b
ODN 2216 FITC	FITC-labeled CpG ODN - human specific, type A	TLR2 -/ TLR4 -	50 µg	tlrl-2216f
ODN 2216 VacciGrade™	Stimulatory CpG ODN Type A Human specific	VacciGrade™	1 mg	vac-2216-1
ODN 2336	Stimulatory CpG ODN Type A Human specific	TLR2 -/ TLR4 -	1 mg *	tlrl-2336-1
ODN 2395	Stimulatory CpG ODN Type C Human / mouse	TLR2 -/ TLR4 -	200 µg *	tlrl-2395
ODN 2395 control	Negative control for ODN 2395	TLR2 -/ TLR4 -	1 mg	tlrl-2395c-1
ODN 2395 FITC	FITC-labeled CpG ODN - human specific, type C	TLR2 -/ TLR4 -	50 µg	tlrl-2395f
ODN 2395 VacciGrade™	Preclinical grade ODN 2395	VacciGrade™	1 mg	vac-2395-1
ODN BW006 (ODN684)	Class B CpG ODN, human & mouse	TLR2 -/ TLR4 -	200 µg	tlrl-bw006
ODN D-SL01	Class B CpG ODN, multispecies	TLR2 -/ TLR4 -	200 µg	tlrl-dsl01
ODN D-SL03	Class C CpG ODN, multispecies	TLR2 -/ TLR4 -	200 µg	tlrl-dsl03
ODN M362	Stimulatory CpG ODN Type C Human / mouse	TLR2 -/ TLR4 -	200 µg *	tlrl-m362
TLR9 ANTAGONISTS				
ODN 2088	Inhibitory ODN, mouse preferred	TLR2 -/ TLR4 -	200 µg *	tlrl-2088
ODN 2088 control	Negative control for ODN 2088	TLR2 -/ TLR4 -	1 mg	tlrl-2088c-1
ODN 4084-F	Class B inhibitory ODN	TLR2 -/ TLR4 -	200 µg	tlrl-4084
ODN INH-18	Inhibitory ODN, human & mouse	TLR2 -/ TLR4 -	200 µg	tlrl-inh18
ODN TTAGGG (A151)	Inhibitory ODN, human preferred	TLR2 -/ TLR4 -	200 µg *	tlrl-ttag151
ODN TTAGGG (A151) control	Negative control for ODN TTAGGG	TLR2 -/ TLR4 -	1 mg	tlrl-ttagc-1

NOD LIGANDS

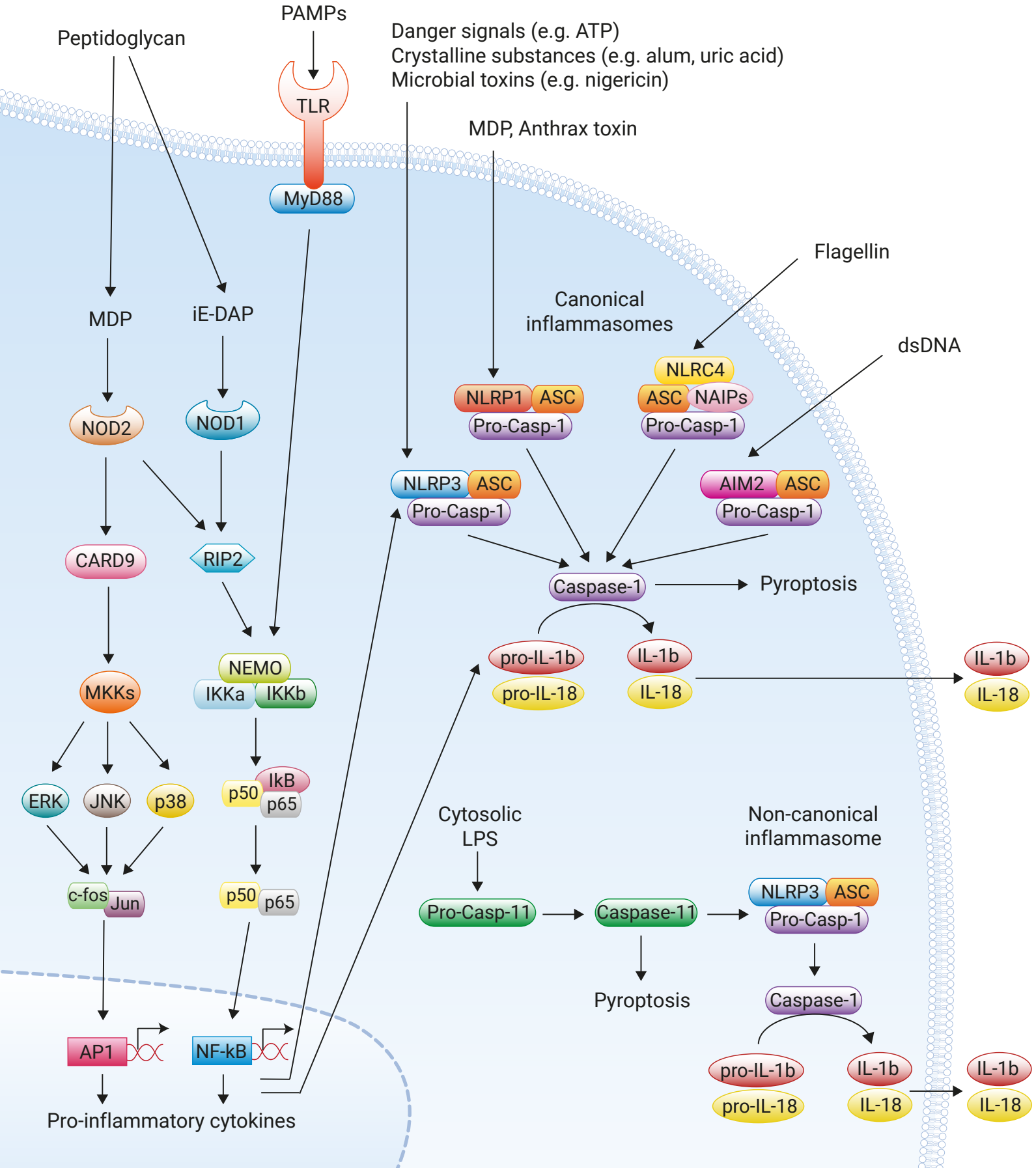
https://www.invivogen.com/nod-ligands

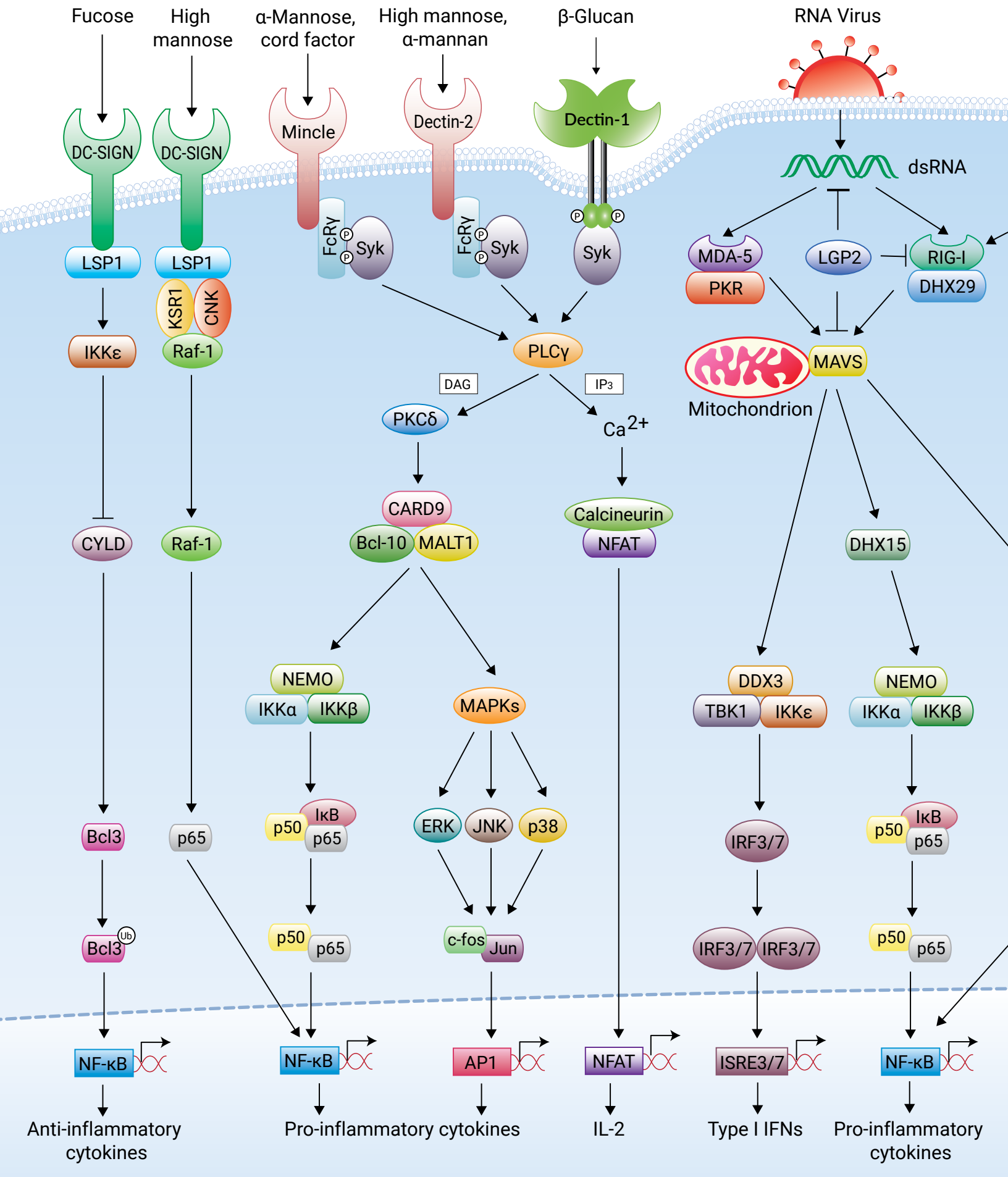
PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
NOD1 AGONISTS				
C12-iE-DAP	Acylated derivative of iE-DAP	TLR2 -/ TLR4 -	1 mg	tlrl-c12dap
C14-Tri-LAN-Gly	Meso-lanthionine tri-peptide (CL243)	TLR2 -/ TLR4 -	1 mg	tlrl-ctlg
iE-DAP	D-γ-Glu-mDAP	TLR2 -/ TLR4 -	5 mg	tlrl-dap
Tri-DAP	L-Ala-γ-D-Glu-mDAP	TLR2 -/ TLR4 -	1 mg	tlrl-tdap
NOD2 AGONISTS				
CL429	Pam2C-conjugated murabutide	TLR2 +/ TLR4 -	5 mg	tlrl-c429
CL429 VacciGrade™	TLR2/NOD2 agonist	VacciGrade™	5 mg	vac-c429
L18-MDP	Muramyldipeptide with a C18 fatty acid chain	TLR2 -/ TLR4 -	1 mg	tlrl-lmdp
MDP	Muramyldipeptide (L-D isoform, active)	TLR2 -/ TLR4 -	5 mg	tlrl-mdp
MDP control	Muramyldipeptide (D-D isoform, inactive)	TLR2 -/ TLR4 -	5 mg	tlrl-mdpc
M-TriLYS	Synthetic muramyl tripeptide	TLR2 -/ TLR4 -	1 mg	tlrl-mtl
Murabutide	Synthetic derivative of muramyldipeptide	TLR2 -/ TLR4 -	5 mg	tlrl-mbt
N-Glycolyl-MDP	N-glycolylated muramyldipeptide	TLR2 -/ TLR4 -	5 mg	tlrl-gmdp
NOD1/2 AGONISTS				
M-TriDAP	MurNAc-L-Ala-γ-D-Glu-mDAP	TLR2 -/ TLR4 -	1 mg	tlrl-mtd
PGN-ECndi Ultrapure	Insoluble peptidoglycan from E. coli K12	TLR2 -/ TLR4 -	5 mg	tlrl-kipgn
PGN-ECndss Ultrapure	Soluble sonicated peptidoglycan from E. coli K12	TLR2 -/ TLR4 -	1 mg	tlrl-ksspgn
PGN-SAndi Ultrapure	Insoluble peptidoglycan from S. aureus	TLR2 -/ TLR4 -	5 mg	tlrl-sipgn

** Available different quantities*

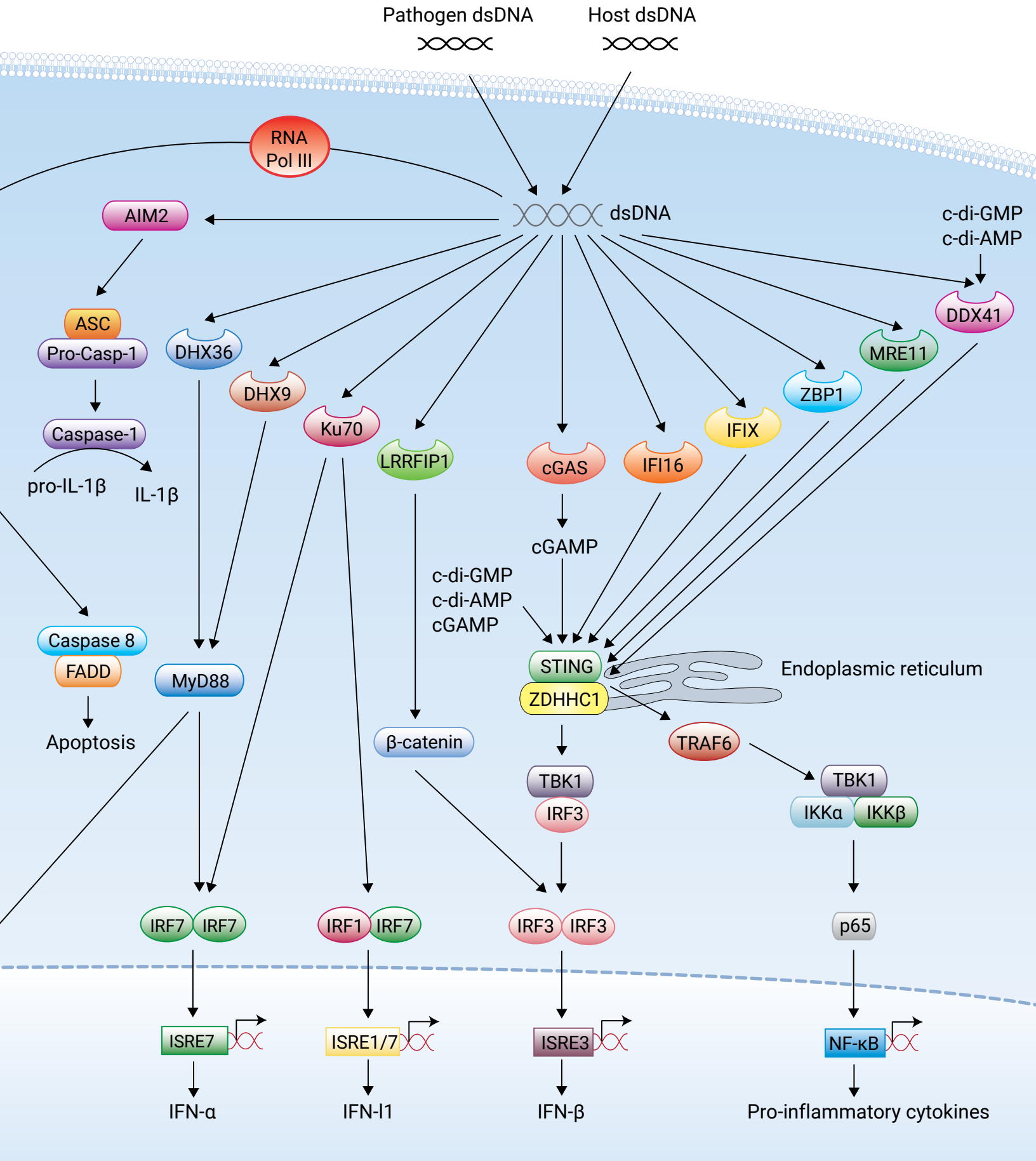

Bacterial cell wall components
TLR2
TLR1/6
LPS
LBP
MD2
CD14
TLR4
Bacterial cell wall components
TLR1
TLR2
TLR6
Flagellin
TLR5
TIRAP
MyD88
TIRAP
MyD88
MyD88
Endosome
CpG DNA
ssRNA
ssRNA
23S rRNA
dsRNA
TLR2
TLR9
TLR7
TLR8
TLR13
TLR3
TLR4
TRAM
MyD88
MyD88
MyD88
TRAM
TRIF
IRAK4
IRAK1
IRAK2
Pellino
TRAF6
Bcl-10
MALT1
TRADD
RIP1
IRAK4
IRAK1
TRAF6
IRAK4
IRAK2
TRAF6
TRAF3
TANK
NAP1
TAB2
TAB3
TAK1
IKKa
NEMO
IKKa
IKKb
TBK1
IKKe
DDX3
MKKs
NEMO
IKKa
IKKb
IRF7
p50
IkB
p65
IRF3
ERK
JNK
p38
p50
IkB
p65
IRF7
IRF7
p50
p65
IRF3
IRF3
c-fos
Jun
p50
p65
ISRE7
NF-kB
ISRE3
AP1
NF-kB
IFN-a
Pro-inflammatory cytokines
IFN-b
Pro-inflammatory cytokines

TLR & NLR Signaling Pathways




Fucose
High mannose
α-Mannose, cord factor
High mannose, α-mannan
β-Glucan
RNA Virus
DC-SIGN
DC-SIGN
Mincle
Dectin-2
Dectin-1
dsRNA
LSP1
LSP1
FcRγ
Syk
FcRγ
Syk
Syk
MDA-5
PKR
LGP2
RIG-I
DHX29
KSR1
CNK
IKKε
Raf-1
PLCγ
MAVS
Mitochondrion
DAG
IP3
PKCδ
Ca2+
CYLD
Raf-1
CARD9
Bcl-10
MALT1
Calcineurin
NFAT
DHX15
NEMO
IKKα
IKKβ
MAPKs
DDX3
TBK1
IKKε
NEMO
IKKα
IKKβ
Bcl3
p65
IκB
p50
p65
ERK
JNK
p38
IRF3/7
IκB
p50
p65
Bcl3
Ub
p50
p65
c-fos
Jun
IRF3/7
IRF3/7
p50
p65
NF-κB
NF-κB
AP1
NFAT
ISRE3/7
NF-κB
Anti-inflammatory cytokines
Pro-inflammatory cytokines
IL-2
Type I IFNs
Pro-inflammatory cytokines

CLR, RLR & CDS Signaling Pathways



INFLAMMASOME INDUCERS

https://www.invivogen.com/inflammasome-inducers

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
AIM2 INFLAMMASOME AGONISTS				
Poly(dA:dT) Naked	Poly(dA-dT)•poly(dT-dA)	TLR2 -/ TLR4 -	200 µg *	tlrl-patn
Poly(dA:dT)/LyoVec	Poly(dA-dT)•poly(dT-dA)/LyoVec™ complexes	TLR2 -/ TLR4 -	100 µg	tlrl-patc
Poly(dA:dT)/Rhodamine	Rhodamine labeled poly(dA-dT)•poly(dT-dA)	TLR2 -/ TLR4 -	10 µg	tlrl-patrh
NLRC4 INFLAMMASOME INDUCERS				
LFn-Needle	T3SS Needle protein fused to Lethal Factor	TLR2-/TLR4-	5 µg	tlrl-ndl
LFn-Rod	T3SS Inner Rod protein fused to Lethal	TLR2-/TLR4	50 µg	tlrl-rod
FLA-ST Standard	Standard Flagellin from S. typhimurium		100 µg	tlrl-stfla
FLA-ST Ultrapure	Ultrapure Flagellin from S. typhimurium		50 µg *	tlrl-epstfla
NLRP1 INFLAMMASOME INDUCERS				
Val-boroPro	NLRP1 activator (DPP8/9 inhibitor)	TLR2 -/ TLR4 -	10 mg *	tlrl-vbp-10
L18-MDP	Muramyldipeptide with a C18 fatty acid chain	TLR2 -/ TLR4 -	1 mg	tlrl-lmdp
MDP	Muramyldipeptide (L-D isoform, active)	TLR2 -/ TLR4 -	5 mg	tlrl-mdp
NLRP3 INFLAMMASOME INDUCERS				
Alum	Alum Hydroxide suspension	TLR2 -/ TLR4 -	500µL	tlrl-aloh
ATP	Adenosine 5'-triphosphate disodium salt	TLR2 -/ TLR4 -	1 g	tlrl-atpl
CPPD Crystals	Calcium pyrophosphate dihydrate	TLR2 -/ TLR4 -	5 mg	tlrl-cppd
Hemozoin	Synthetic heme crystal	TLR2 -/ TLR4 -	5 mg	tlrl-hz
MSU Crystals	Monosodium urate (uric acid)	TLR2 -/ TLR4 -	5 mg *	tlrl-msu
Nano-SiO2	Nanoparticles of silica dioxide	TLR2 -/ TLR4 -	20 mg	tlrl-sio-2
Nigericin	Nigericin, sodium salt	TLR2 -/ TLR4 -	10 mg *	tlrl-nig
TDB	Synthetic analog of the cord factor	TLR2 -/ TLR4 -	2 mg	tlrl-tdb
Cholesterol Crystals	CAS number 57-88-5		20 mg *	tlrl-chol
NON-CANONICAL INFLAMMASOME INDUCERS				
E. coli OMVs	Purified outer membrane vesicles from E. coli BL21	TLR2 +/ TLR4 +	100 µg	tlrl-omv-1
E. coli OMVs InvivoFit™	Sterile grade of outer membrane vesicles from E. coli	TLR2 +/ TLR4 +	500 µg	tlrl-omv
Curdlan	Beta-1,3-glucan from Alcaligenes faecalis	TLR2 -/ TLR4 -	1 g	tlrl-curd
HKCA	Heat-killed Candida albicans	TLR2 -/ TLR4 -	10^9 cells	tlrl-hkca
Pustulan	Beta-glucan from Lasallia pustulata	TLR2 -/ TLR4 -	100 mg	tlrl-pst
Zymosan Depleted	Hot alkali treated zymosan	TLR2 -/ TLR4 -	10 mg	tlrl-zyd

VACCIGRADE™

VacciGrade™ is a high-quality pre-clinical grade. VacciGrade™ products are filter-sterilized (0.2 µm) and filled under strict aseptic conditions in a clean room*. The absence of bacterial contamination is assessed by a sterility test using a pharmacopeia-derived assay. The level of bacterial contaminants (endotoxins and lipoproteins) in each lot is verified using a LAL assay and/or a TLR2 and TLR4 reporter assay.

**Except for LPS VacciGrade™, which is prepared in a laminar flow hood dedicated to LPS.*

RLR LIGANDS

https://www.invivogen.com/rlr-ligands

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
RIG-I AGONISTS				
3p-hpRNA	5' triphosphate hairpin RNA	TLR2 -/ TLR4 -	25 µg *	tlrl-hprna
5'ppp-dsRNA	5'Triphosphate blunt-end double-stranded RNA	TLR2 -/ TLR4 -	25 µg *	tlrl-3prna
5'ppp-dsRNA/LyoVec™	5'ppp-dsRNA/LyoVec™ complexes	TLR2 -/ TLR4 -	25 µg *	tlrl-3prnalv
5'ppp-dsRNA Control	Blunt-end double-stranded RNA, control	TLR2 -/ TLR4 -	25 µg *	tlrl-3prnac
5'ppp-dsRNA Control/LyoVec™	5'ppp-dsRNA Control/LyoVec™ complexes	TLR2 -/ TLR4 -	25 µg *	tlrl-3prnaclv
RIG-I/MDA5 AGONISTS				
Poly(I:C) (HMW)/LyoVec™	Poly(I:C) (HMW)/LyoVec™ complexes	TLR2 -/ TLR4 -	100 µg	tlrl-piclv
Poly(I:C) (LMW)/LyoVec™	Poly(I:C) (LMW)/LyoVec™ complexes	TLR2 -/ TLR4 -	100 µg	tlrl-picwlv

CLR LIGANDS

https://www.invivogen.com/clr-ligands

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
DECTIN-1 AGONISTS				
Beta-Glucan Peptide	Beta-glucan from Trametes versicolor	TLR2 -/ TLR4 -	50 mg	tlrl-bgp
Curdlan	Beta-1,3-glucan from Alcaligenes faecalis	TLR2 -/ TLR4 -	1 g	tlrl-curd
HKCA	Heat-killed Candida albicans	TLR2 -/ TLR4 -	109 cells	tlrl-hkca
Laminarin	Soluble beta-glucan from Laminaria digitata	TLR2 +/ TLR4 -	100 mg	tlrl-lam
Pustulan	Beta-glucan from Lasallia pustulata	TLR2 -/ TLR4 -	100 mg	tlrl-pst
Scleroglucan	Beta-glucan from Sclerotium rolfsii	TLR2 +/ TLR4 +	100 mg	tlrl-scg
WGP Dispersible	Whole Glucan Particles, insoluble	TLR2 -/ TLR4 -	50 mg	tlrl-wgp
WGP Soluble	Whole Glucan Particles, soluble	TLR2 -/ TLR4 -	50 mg	tlrl-wgps
Zymosan	Cell wall preparation from S. cerevisiae	TLR2 +/ TLR4 -	100 mg	tlrl-zyn
Zymosan Depleted	Hot alkali treated zymosan	TLR2 -/ TLR4 -	10 mg	tlrl-zyd
DECTIN-2 AGONISTS				
Furfurman	Malassezia furfur cell wall preparation	TLR2 -/ TLR4 -	10 mg	tlrl-ffm
MINCLE AGONISTS				
β-GlcCer	Synthetic β-glucosylceramide	TLR2-/TLR4-	5 mg	tlrl-bglcer
HKMT	Heat Killed Mycobacterium tuberculosis	TLR2 +/ TRL4 -	10 mg	tlrl-hkmt-1
TDB	Synthetic analog of the cord factor	TLR2 -/ TLR4 -	2 mg	tlrl-tdb
TDB VacciGrade™	Preclinical grade TDB	VacciGrade™	2 mg	vac-tdb
TDM	Trehalose-6,6-dimycolate; also known as cord factor	TLR2 -/ TLR4 -	2 mg	tlrl-tdm

** Available different quantities*

CDS & STING LIGANDS

https://www.invivogen.com/cds-ligands

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
CDS AGONISTS				
ODN TTAGGG (A151)	Inhibitory ODN, human preferred	TLR2 -/ TLR4 -	200 µg	tlrl-ttag151
dsDNA-EC	E. coli K12 genomic DNA	TLR2 -/ TLR4 -	200 µg	tlrl-ecdna
G3-YSD	Y-form DNA	TLR2 -/ TLR4 -	200 µg	tlrl-ydna
G3-YSD Control	Control for Y-form DNA	TLR2 -/ TLR4 -	200 µg	tlrl-ydnac
HSV-60 Naked	HSV1-derived 60 bp oligonucleotide	TLR2 -/ TLR4 -	200 µg	tlrl-hsv60n
HSV-60 LyoVec™	Precomplexed HSV1-derived 60 bp ODN	TLR2 -/ TLR4 -	100 µg	tlrl-hsv60c
ISD Naked	Interferon stimulatory DNA	TLR2 -/ TLR4 -	200 µg	tlrl-isdn
ISD/LyoVec™	Precomplexed interferon stimulatory DNA	TLR2 -/ TLR4 -	100 µg	tlrl-isdc
ISD Control Naked	Non-immunostimulatory ODN	TLR2 -/ TLR4 -	200 µg	tlrl-isdcn
ISD Control/LyoVec™	Precomplexed non-immunostimulatory ODN	TLR2 -/ TLR4 -	100 µg	tlrl-isdcc
Poly(dA:dT) Naked	Poly(dA-dT)•poly(dT-dA)	TLR2 -/ TLR4 -	200 µg	tlrl-patn
Poly(dA:dT)/LyoVec™	Poly(dA-dT)•poly(dT-dA)/LyoVec™ complexes	TLR2 -/ TLR4 -	100 µg	tlrl-patc
Poly(dA:dT)/Rhodamine	Rhodamine labeled poly(dA-dT)•poly(dT-dA)	TLR2 -/ TLR4 -	10 µg	tlrl-patrh
Poly(dG:dC) Naked	Poly(dG-dC)•poly(dG-dC)	TLR2 -/ TLR4 -	200 µg	tlrl-pgcn
Poly(dG:dC)/LyoVec™	Poly(dG-dC)•poly(dG-dC)/LyoVec™ complexes	TLR2 -/ TLR4 -	100 µg	tlrl-pgcc
TDI-6570	Mouse cGAS Inhibitor		2 mg *	inh-tdi6570-1
VACV-70 Naked	Vaccinia virus-derived 70 bp oligonucleotide	TLR2 -/ TLR4 -	200 µg	tlrl-vav70n
VACV-70/LyoVec™	Precomplexed vaccinia virus-derived 70 bp ODN	TLR2 -/ TLR4 -	100 µg	tlrl-vav70c
VACV-70c Naked	Control for VACV-70 ODN	TLR2 -/ TLR4 -	200 µg	tlrl-vav70cn
VACV-70c/LyoVec™	Precomplexed control for VACV-70 ODN	TLR2 -/ TLR4 -	100 µg	tlrl-vav70cc
STING AGONISTS				
2'3'-cGAMP	2'5'-3'5' Cyclic GMP-AMP	TLR2 -/ TLR4 -	200 µg *	tlrl-ncga23-02
2'3'-cGAMP Control	Linear dinucleotide analog of 2'3'-cGAMP	TLR2 -/ TLR4 -	1 mg	tlrl-nagpap
2'3'-cGAMP VacciGrade™	Preclinical grade 2'5'-3'5' cyclic GMP-AMP	VacciGrade™	1 mg	vac-nacga23
2'3'-cGAM(PS)2 (Rp/Sp)	Bis-phosphorothioate analog of 2'3'-cGAMP	TLR2 -/ TLR4 -	250 µg	tlrl-nacga2srs
2'3'-c-di-AM(PS)2 (Rp,Rp)	Bisphosphorothioate analog of 2'3'-c-di-AMP	TLR2 -/ TLR4 -	100 µg *	tlrl-nada2r-01
2'3'-c-di-AM(PS)2 (Rp,Rp) VacciGrade™	Preclinical grade of bisphosphorothioate analog of of 2'3'-c-di-AMP	VacciGrade™	500 µg	vac-nacda2r
3'3'-cGAMP	3'5'-3'5' Cyclic GMP-AMP	TLR2 -/ TLR4 -	500 µg *	tlrl-nacga
3'3'-cGAMP Fluorinated	Difluor cyclic [G(3',5')pA(3',5')p]	TLR2 -/ TLR4 -	200 µg	tlrl-nacgaf-2
cAIMP (CL592)	Cyclic [A(3',5')pI(3',5')p]	TLR2 -/ TLR4 -	500 µg	tlrl-nacai
cAIMP Difluor (CL614)	Difluor cyclic [A(3',5')pI(3',5')p]	TLR2 -/ TLR4 -	250 µg	tlrl-nacaidf
cAIM(PS)2 Difluor (Rp/Sp)	Difluor and bisphosphorothioate analog of cAIMP	TLR2 -/ TLR4 -	200 µg	tlrl-nacairs-2
c-di-AMP	3'5' Cyclic di-AMP	TLR2 -/ TLR4 -	1 mg *	tlrl-nacda
c-di-AMP VacciGrade™	Sterile 3'5' cyclic di-AMP	VacciGrade™	1 mg	vac-nacda
c-di-GMP	3'5' Cyclic di-GMP	TLR2 -/ TLR4 -	1 mg *	tlrl-nacdg
c-di-GMP VacciGrade™	Preclinical grade of cyclic [G(3',5')pG(3',5')p]	VacciGrade™	1 mg	tlrl-nacdg
c-di-GMP Fluorinated	Difluoro cyclic [G(3',5')pG(3',5')p]	TLR2 -/ TLR4 -	200 µg	tlrl-nacdgf-2
diABZI (compound 3)	Non-CDN STING ligand (trihydrochloride form)	TLR2 -/ TLR4 -	1mg	tlrl-diabzi
DMXAA	5,6-dimethyl-xanthenone-4-acetic acid	TLR2 -/ TLR4 -	5 mg	tlrl-dmx

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
CONJUGATABLE STING LIGANDS				
STG-982 VacciGrade™	STING agonist with a maleimide group	VacciGrade™	250 µg *	vac-stg982
STG-968 VacciGrade™	STING agonist with an azido group	VacciGrade™	250 µg *	vac-stg968
MINCLE AGONISTS				
Amlexanox	TBK1/IKKε inhibitor	TLR2-/TLR4-	50 mg	inh-amx
Brefeldin A	STING trafficking inhibitor	TLR2-/TLR4-	10 mg	inh-bfa
BX795	TBK1/IKKε inhibitor	TLR2-/TLR4-	5 mg	tlrl-bx7
G140	Human cGAS inhibitor	TLR2-/TLR4-	2 mg	inh-g140
H-151	Synthetic Indole Derivative - STING Inhibitor	TLR2-/TLR4-	10mg	inh-h151
Leptomycin B	cGAS nuclear export inhibitor	TLR2-/TLR4-	5 x 5 µg	inh-lep-5
MRT67307	TBK1/IKKε inhibitor	TLR2-/TLR4-	10 mg	inh-mrt
ODN TTAGGG (A151)	TLR9, AIM2, and cGAS inhibitor	TLR2-/TLR4-	20 0µg *	tlrl-ttag151
RU.521	Murine cGAS inhibitor	TLR2-/TLR4-	2 mg	inh-ru521

AHR & TIFA/ALPK1 LIGANDS

https://www.invivogen.com/ahr-tifa-alpk1-ligands

PRODUCT	ORIGIN/DESCRIPTION	GRADE*	QTY	CAT. CODE
AhR AGONISTS				
FICZ	6-Formylindolo[3,2-b]carbazole	TLR2 -/ TLR4 -	1 mg	tlrl-ficz
AhR ANTAGONISTS				
CH-223191	2-methyl-2H-pyrazole-3-carboxylic acid	TLR2 -/ TLR4 -	10 mg	inh-ch22
ALPK1 LIGANDS				
ADP-Heptose (L-isomer)	Synthetic ADP-L-Heptose		250 µg	tlrl-adph-1
UD(PS)-Heptose (L-isomer)	Synthetic ADP-L-Heptose analogue		250 µg	tlrl-udpsh-1

** Available different quantities*

High quality Reagents

Functionnaly tested and validated.

All InvivoGen's products are developed under strict quality control to ensure viability, stability, reproducibility to guarantee reliable and consistent performance.

Bulk Quantity Available

InvivoGen offers bulk quantities of our PRR ligands collection upon request. Please contact us for more information: tech.eu@invivogen.com

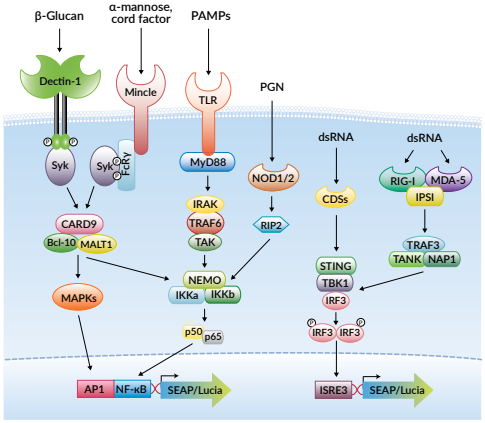
Learn More

www.invivogen.com/ligands

PRR REPORTER CELLS

Non-Immune Reporter Cells

Cells that constitutively overexpress a given functional PRR gene are valuable tools for many applications, such as the study of the mechanisms involved in PRR recognition or signaling, and the development of novel therapeutic targets. InvivoGen provides human embryonic kidney (HEK)-293 cells that stably express a PRR gene as well as an NF-kB-inducible SEAP (secreted embryonic alkaline phosphatase) reporter gene to specifically monitor the activation and downstream signaling of a number of PRRs.



PRODUCT	CAT CODE (Human)	CAT CODE (Mouse)
HEK-Blue™ TLR2 Cells	hkb-htlr2	hkb-mtlr2
HEK-Blue™ TLR2-TLR1 Cells	hkb-htlr21	-
HEK-Blue™ TLR2-TLR6 Cells	hkb-htlr26	-
HEK-Blue™ TLR3 Cells	hkb-htlr3	hkb-mtlr3
HEK-Blue™ TLR4 Cells	hkb-htlr4	hkb-mtlr4
HEK-Blue™ TLR5 Cells	hkb-htlr5	hkb-mtlr5
HEK-Blue™ TLR7 Cells	hkb-htlr7	hkb-mtlr7
HEK-Blue™ TLR8 Cells	hkb-htlr8	hkb-mtlr8
HEK-Blue™ TLR9 Cells	hkb-htlr9	hkb-mtlr9
HEK-Blue™ NOD1 cells	hkb-hnod1	hkb-mnod1
HEK-Blue™ NOD2 cells	hkb-hnod2	hkb-mnod2
HEK-Blue™ Dectin1b cells	hkb-hdect1b	hkb-mdect1b

For the complete list of non-immune PRR reporter cells please visit *www.invivogen. com/hek-293*

Non-Immune Reporter Cells

Cells of the immune system, including lymphocytes, monocytes, and macrophages, naturally express a large repertoire of PRRs. InvivoGen has developed stable reporter cells in several well-established immune cell models. These immune reporter cells stably express the Lucia luciferase (encoding a secreted luciferase) and/or SEAP reporter genes under the control of specific inducible promoters allowing to efficiently and conveniently monitor the activity of PRR ligands.

Variety of immune cells

- Human Jurkat T lymphocytes
- Human Ramos B lymphocytes
- Mouse RAW 264.7 macrophages
- Human THP-1 monocytes

InvivoGen's immune reporter cells can be used to study their physiological response to PRR ligands. In addition, some immune reporter cells have been modified (either by overexpression or knock-out of co-receptors) to provide enhanced or diminished responses to specific ligands.

Single or dual pathway studies

- NF-κB(/AP-1) and/or IRF

Choice of two secreted reporter genes

- SEAP and/or Lucia luciferase

Levels of SEAP and Lucia luciferase can be determined from the same cell supernatant using the highly-sensitive detection reagents QUANTI-Blue™ and QUANTI-Luc™ 4 Lucia/Gaussia respectively.
PRR reporter cells are provided with the appropriate selective antibiotic(s) and are guaranteed mycoplasma-free.

PRODUCT	CAT CODE
Jurkat-Dual™ (NF-κB-Lucia, IRF-SEAP)	jktd-isnf
Ramos-Blue™ (NF-κB-SEAP)	rms-sp
Ramos-Blue™ KD-MyD (NF-κB-SEAP)	rms-kdmyd
RAW-Blue™ (NF-κB-SEAP)	raw-sp
RAW-Blue™ ISG (IRF-SEAP)	raw-isg
RAW-Lucia™ ISG (IRF-Lucia)	rawl-isg
RAW-Lucia™ ISG-KO-cGAS (IRF-Lucia)	rawl-kocgas
RAW-Lucia™ ISG-KO-IFI16 (IRF-Lucia)	rawl-koif16
RAW-Lucia™ ISG-KO-IRF3 (IRF-Lucia)	rawl-koirf3
RAW-Lucia™ ISG-KO-STING (IRF-Lucia)	rawl-kostg
THP1-Blue™ ISG (IRF-SEAP)	thp-isg
THP1-Blue™ NF-κB (NF-κB-SEAP)	thp-nfkb
THP1-Lucia™ ISG (IRF-Lucia)	thpl-isg
THP1-Dual™ (NF-κB-SEAP, IRF-Lucia)	thpd-nfis
THP1-Dual™ KO-MyD (NF-κB-SEAP, IRF-Lucia)	thpd-komyd

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