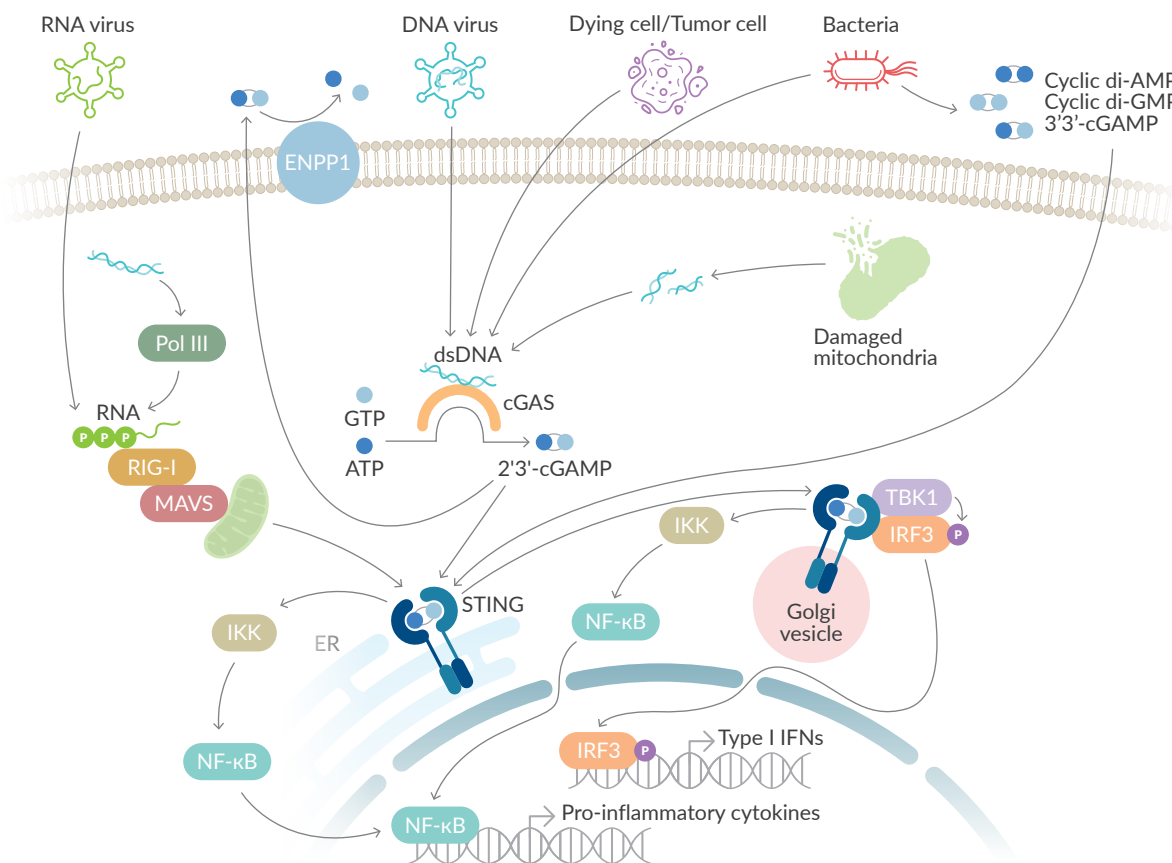


STING Signaling Pathway

STimulator of INTERferon Genes and the innate immune response

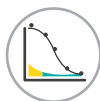


Cayman offers a dedicated tool set to study STING, a central mediator of the innate immune response that induces the expression of various interferons, cytokines, and T cell recruitment factors and has the potential to enhance the initial anticancer response. Products include cyclic dinucleotides (CDNs), recombinant STING variants, ELISA kits, agonists, inhibitors, and additional key pattern recognition receptor proteins and antibodies to study this area of therapeutic interest. *In silico* modeling and SPR analysis services are available to help identify novel STING modulators.



The mammalian cytosolic DNA sensor cGAS signals through the adaptor protein STING. STING is also a direct sensor of bacterial and mammalian CDNs. Irrespective of cell type or DNA sequence, activation of STING through the cGAS-cGAMP-STING signaling pathway is essential for DNA-mediated immune responses. Hydrolysis of cGAMP by ENPP1 attenuates cGAS-STING signaling. The cytosolic RNA sensor RIG-I signals through the adaptor protein MAVS to trigger signaling cascades common to STING that lead to the production of type I IFNs and pro-inflammatory cytokines.

Discover Cayman's STING Research Tools INSIDE!



High-Sensitivity Assays

Cyclic Dinucleotide ELISA Kits



Well-Characterized Proteins

cGAS, STING Variants, & More



Wide Range of Biochemicals

Small Molecule Agonists & Antagonists



High Quality & Specific Antibodies

cGAS, STING, TBK1, IRF3, MAVS, & More

Cytosolic Nucleic Acid Sensing

Specific families of pattern recognition receptors are responsible for detecting DNA or RNA from invading microbes or host cells and generating innate immune responses. Cayman has developed tools to study this process that leads to activation of the type I IFN and NF- κ B pathways.

Cytosolic DNA Sensor

Item No.	Product Name
22810	cGAS (human, recombinant)
23853	cGAS Monoclonal Antibody (Clone 5G10)

Cytosolic RNA Sensor & Adaptor Protein

Item No.	Product Name
25620	RIG-I helicase domain (human, recombinant)
25300	RIG-I Monoclonal Antibody (Clone 1E3)
26355	MAVS Monoclonal Antibody (Clone 7B9)

CDNs & Negative Controls

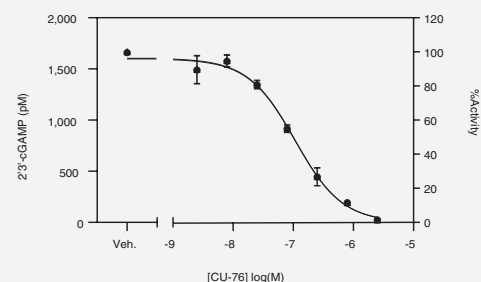
Item No.	Product Name
17753	Cyclic di-AMP (sodium salt)
17144	Cyclic di-GMP (sodium salt)
22485	Cyclic di-IMP (sodium salt)
33890	Cyclic di-UMP (sodium salt)
22419	2'2'-cGAMP (sodium salt)
19887	2'3'-cGAMP (sodium salt)
17966	3'3'-cGAMP (sodium salt)
33886	5'-pApA (sodium salt)
33889	5'-pGpG (sodium salt)

Tools to Study cGAS Activity

cGAS Inhibitor Screening Assay Kit Item No. 701930

A robust, easy-to-use ELISA for screening modulators of human cGAS

- Active cGAS enzyme and substrates are provided to screen for inhibitors
- Directly measure 2'3'-cGAMP production as an indicator of cGAS activity



Inhibition of recombinant human cGAS by cGAS Inhibitor (CU-76)

cGAS Inhibitors

Item No.	Product Name
31029	CU-32
31030	CU-76
28318	G150
32515	PF-06928215
31765	RU-521



Read about targeting cGAS activity in cancer and autoimmune disease drug discovery at www.caymanchem.com/cGASassays

Sensitive, Accurate Quantification of Cyclic Dinucleotides

Cayman, in collaboration with Biolog Life Science Institute, has developed immunoassays for specific detection of 2'3'-cGAMP, cyclic di-GMP, and cyclic di-AMP. These assays can be used to monitor CDN formation and hydrolysis in a biological setting and identify compounds that modulate activation and degradation.

- **Highly Sensitive:** Sensitive immunoassay format down to low pg/ml range concentrations
- **Reliable:** Validated in THP-1 or *E. coli* cell lysates

2'3'-cGAMP ELISA Kit

Item No. 501700

Measure 2'3'-cGAMP in mammalian cell lysates

Cyclic di-GMP ELISA Kit

Item No. 501780

Measure cyclic di-GMP in bacterial cell lysates

Cyclic di-AMP ELISA Kit

Item No. 501960

Measure cyclic di-AMP in bacterial cell lysates

STING Activation

STING binds to CDNs, activating signals that stimulate IFN genes. Cayman offers variants of the STING proteins that occur as natural haplotypes or introduce point mutations within the CDN binding domain as well as antibodies and synthetic agonists to help understand the events that lead to IFN induction.

STING Variants

Item No.	Product Name
22816	STING R232 variant (human, recombinant)
22815	STING H232 variant (human, recombinant)
15139	STING H232 variant; SUMO-tagged (human, recombinant)
23592	STING AQ variant (human, recombinant)
23594	STING M284 variant (human, recombinant)
23593	STING R224 variant (human, recombinant)
25306	STING A162 variant (human, recombinant)

Read more about [genetic variations in human STING that affect CDN binding and STING activation at www.caymanchem.com/STINGvariants](http://www.caymanchem.com/STINGvariants)

STING Antibodies

Item No.	Product Name
24791	STING M284 variant Polyclonal Antibody
25922	STING M284 variant Monoclonal Antibody (Clone 8E7)
17856	STING Monoclonal Antibody (Clone 2C8)
25923	STING (C-Term) Monoclonal Antibody (Clone 1B10)
17857	STING Polyclonal Antibody

Designer STING Agonists

Item No.	Product Name
30022	CAY10748
27884	Cridanimod (sodium salt)
28054	diABZI STING Agonist-1 (hydrochloride)
30156	DSDP
14617	DMXAA
22353	G10
29108	α -Mangostin
24106	ML RR-S2 CDA (ammonium salt)
30140	MSA-2
31759	SR 717 (lithium salt)
32520	STING Agonist 1a
27886	STING Agonist C11
32521	STING Agonist 12b

STING Antagonists

Item No.	Product Name
30157	C-170
30159	C-171
25860	C-178
25859	C-176
25857	H-151
28319	STING18

Tools to Study STING Regulation

Ectonucleotide pyrophosphatase/phosphodiesterase 1 (ENPP1) negatively regulates STING by decreasing the concentration of 2'3'-cGAMP. ENPP1 is upregulated in cancer. Preventing its activity may have an important role in cancer immunotherapy.

ENPP1 Inhibitors

Item No.	Product Name
29864	3,3'-((2-Chlorophenyl)methylene)bis(4-hydroxy-2H-chromen-2-one)
31764	ENPP1-IN-1
29809	ENPP1 Inhibitor C
29865	CAY10761



Helping Recruit Immune Cells to Cancer

Read about additional ways STING can be activated in cancer cells at www.caymanchem.com/DNA DamageSTING

CAYMAN CONTRACT SERVICES

Looking to Identify Novel hSTING Agonists/Antagonists?

Our experts offer computer-aided drug design (CADD) to virtually screen compounds using Schrödinger software and further characterization of hSTING agonists *via* SPR analysis.



Download our scientific poster to learn more www.caymanchem.com/hSTINGAgonists

Host Immune Response

Phosphorylation of the transcription factor IRF3 by the IKK-related kinase TBK1 leads to production of type I IFN. Cayman has developed key proteins, antibodies, and chemical modulators to study the important players in this process as well as the activation of NF- κ B triggered by IKK, which controls the expression of cytokines.

Interferon Activation Proteins & Antibodies

Item No.	Product Name
22811	IRF3 (human recombinant)
23590	IRF3 (S386A, S396A mutant; human recombinant)
22817	TBK1 (human, recombinant)
24937	IRF3 Polyclonal Antibody
25924	TBK1 Monoclonal Antibody (Clone 4E6)

Interferon Pathway Modulators

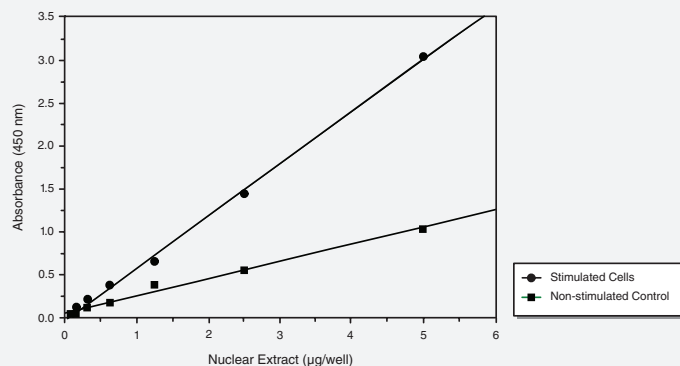
Item No.	Product Name
17869	Dimethyl biphenyl-4,4'-dicarboxylate
30960	IFN- α -IFNAR-IN-1 (hydrochloride)
20449	RO8191
22402	StA-IFN-1

IKK Antibody & Inhibitors

Item No.	Product Name
13931	IKK γ Monoclonal Antibody (Clone 72C627)
14181	Amllexanox
19184	BI-605906
16667	BMS 345541 (trifluoroacetate salt)
10011248	CAY10575
10011249	CAY10576
13313	IKK-16 (hydrochloride)
17276	IKK2 Inhibitor VI
17290	IMD 0354
18774	LY2409881
14862	PS-1145
10010267	SC-514
15115	TPCA-1
11796	Wedelolactone

NF- κ B Transcription Factor Assays

- Sensitive, non-radioactive method to detect human p50 or p65 NF- κ B from whole cell lysates
- Capture the transcription factor using a specific dsDNA sequence bound to the plate
- Detect the dsDNA-bound transcription factor with specific antibodies in an ELISA format
- Nuclear Extraction Kit available to aid in the isolation of nuclear and cytoplasmic fractions from cell lysates or tissue homogenates



Assay of cell lysates isolated from stimulated and non-stimulated HeLa cells demonstrating NF- κ B (p65) activity.

Item No.	Product Name
10006912	NF- κ B (human p50) Transcription Factor Assay Kit
10007889	NF- κ B (p65) Transcription Factor Assay Kit
10009277	Nuclear Extraction Kit

[View a complete list of TNF- \$\alpha\$ /NF- \$\kappa\$ B signaling inhibitors at www.caymanchem.com](http://www.caymanchem.com)

Cytokine Detection Assays

Item No.	Product Name
583301	Interleukin-1 α (human) ELISA Kit
583311	Interleukin-1 β (human) ELISA Kit
501030	Interleukin-6 (human) ELISA Kit
583371	Interleukin-6 (mouse) ELISA Kit
28325	Q-Plex™ Human Cytokine - Inflammation (9-plex)
28328	Q-Plex™ Human Cytokine - HS Screen (15-plex)
28327	Q-Plex™ Human Cytokine - Screen (16-plex)
28332	Q-Plex™ Mouse Cytokine - Inflammation (14-plex)
28329	Q-Plex™ Mouse Cytokine - Screen (16-plex)

View a complete list of STING Research Tools at www.caymanchem.com