

# Immunology and Inflammation

Inflammation is a critical, signal-mediated response to potential signs of danger and damage. While acute inflammation is important to the immune response, chronic, inappropriate inflammation can cause tissue destruction and lead to disease (e.g., allergies, autoimmune disorders). Cayman offers a wide range of tools to help you study the factors related to innate and adaptive immune responses.

- Assays and mass spec standards for the quantification of bioactive lipids
- Corticosteroid receptor agonists, mast cell stabilizers, and antihistamines
- Tools to study citrullination and carbamylation
- TLR and chemokine receptor modulators and NETosis assays
- Immunoepitidome profiling services



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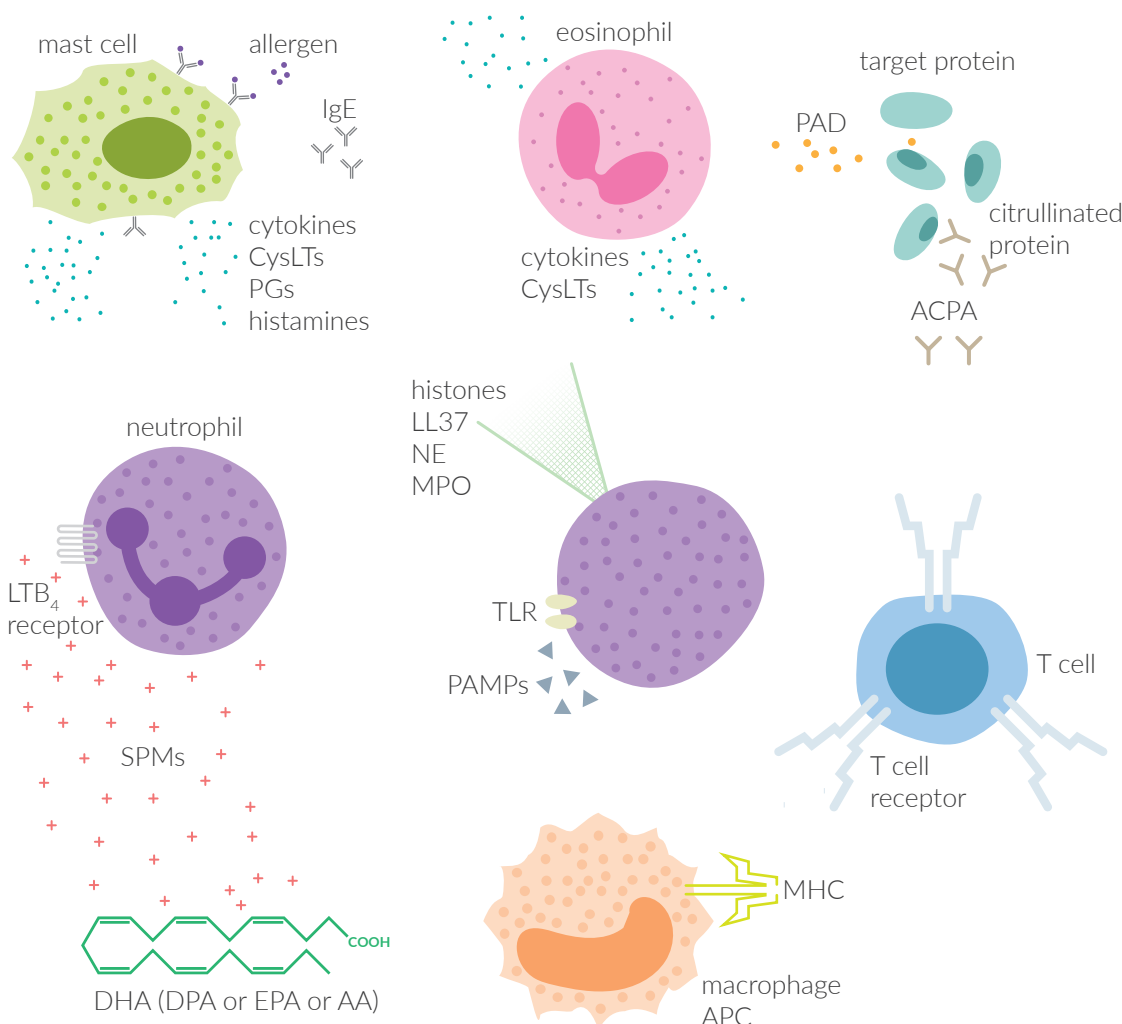
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The cellular environment during infection (or allergen exposure), immune activation, and subsequent inflammation involves a highly complex and well-coordinated team of mediators. This includes mast cells that react to danger by releasing histamines, pro-inflammatory cytokines, and eicosanoids and neutrophils/eosinophils that respond to these signals with an antimicrobial arsenal that involves NETs. Certain protein modifications, like citrullination, can alter self-epitopes and elicit an autoantibody response via T cells. Professional APCs, such as macrophages, activate T cells by displaying a MHC. SPMs, byproducts of DHA and other fatty acids, are generated later to initiate the resolution of inflammation.

# Inflammatory Mediators



Cayman offers a wide range of tools to study biochemical mediators released during the inflammatory process. Our core business is built around the production of bioactive lipids, including the manufacture of high-purity lipid standards and assays for their measurement, as well as biochemicals to disrupt key eicosanoid mediator production or signaling. We lead the industry as a resource for prostaglandins, leukotrienes, and specialized pro-resolving mediators pertinent to the study of immune activation and inflammation.

## Bioactive Lipids

### Leukotrienes

Item No.	Product Name
20110	Leukotriene B <sub>4</sub>
520111	Leukotriene B <sub>4</sub> ELISA Kit*
120114	BLT <sub>1</sub> Receptor Polyclonal Antibody
500390	Cysteinyl Leukotriene ELISA Kit*
20001	Cysteinyl Leukotriene HPLC Mixture I
20002	Cysteinyl Leukotriene HPLC Mixture II
120500	CysLT <sub>1</sub> Receptor Polyclonal Antibody
14713	CysLT <sub>1</sub> Receptor Polyclonal FITC Antibody

### Prostaglandins

Item No.	Product Name
501001	tetranor-PGDM ELISA Kit
12010	Prostaglandin D <sub>2</sub>
512031	Prostaglandin D <sub>2</sub> ELISA Kit*
512011	Prostaglandin D <sub>2</sub> -MOX ELISA Kit*
14010	Prostaglandin E <sub>2</sub>
514010	Prostaglandin E <sub>2</sub> ELISA Kit - Monoclonal*
516521	11 $\beta$ -Prostaglandin F <sub>2<math>\alpha</math></sub> ELISA Kit

\*Also available: express kits

## Pro-Inflammatory Cytokines

### Assays and Protein

Item No.	Product Name
583301	Interleukin-1 $\alpha$ (human) ELISA Kit
583311	Interleukin-1 $\beta$ (human) ELISA Kit
501030	Interleukin-6 (human) ELISA Kit
14493	MIF (human recombinant)
589201	TNF- $\alpha$ (human) ELISA Kit

Additional ELISAs for use in pig and mouse models available online

### Specialized Pro-Resolving Mediators

Item No.	Product Name
90410	Lipoxin A <sub>4</sub>
90415	15(R)-Lipoxin A <sub>4</sub>
90420	Lipoxin B <sub>4</sub>
10878	Maresin 1
501150	Maresin 1 ELISA Kit
16369	Maresin 2
17007	MCTR1
19064	PCTR1
10012554	Resolvin D1
13060	17(R)-Resolvin D1
500380	Resolvin D1 ELISA Kit
10007279	Resolvin D2
501120	Resolvin D2 ELISA Kit
13834	Resolvin D3
10007280	Resolvin D5
10007848	Resolvin E1
18702	SPM D-series LC-MS Mixture

Common SPMs listed; methyl ester forms, internal standards, and LC-MS mixtures also available

### Anti-Inflammatory Compounds

Item No.	Product Name
16293	GIT 27
19739	GSK583
21091	Kukoamine B
14929	MIF Antagonist
18377	Vidofludimus

# Allergy & Asthma



Immune activation and inflammation are both characteristics of an allergic or asthmatic response. Cayman's line of allergy and asthma research products includes tools for measuring and disrupting eicosanoid mediators and assays to assess ovalbumin-induced immune responses. Key corticosteroid receptor agonists, mast cell stabilizers, histamine receptor antagonists/inverse agonists, phosphodiesterase inhibitors, and  $\beta$ -adrenergic receptor agonists are also available.

## DiHOMEs: Potential drivers of allergic responses and thermogenic activity

Dihydroxy metabolites of linoleic acid may be biomarkers for the development of asthma and important mediators of fatty acid metabolism. Cayman offers competitive ELISAs to quantify 9(10)-DiHOME and 12(13)-DiHOME in plasma and serum.

### ( $\pm$ )9(10)-DiHOME ELISA Kit

Item No. 501710

### ( $\pm$ )12(13)-DiHOME ELISA Kit

Item No. 501720

Corresponding unlabeled and deuterated standards for EpOMEs and DiHOMEs are also available for quantification by mass spec.

## Ovalbumin Assay Kits

Item No.	Product Name
500840	Anti-Ovalbumin IgE (mouse) ELISA Kit
500830	Anti-Ovalbumin IgG <sub>1</sub> (mouse) ELISA Kit

## Corticosteroid Receptor Agonists

Item No.	Product Name
15407	Budesonide
20739	Hydrocortisone
18026	Triamcinolone acetonide

Over 10 corticosteroid receptor agonists available online

## Mast Cell Stabilizers

Item No.	Product Name
22173	Compound 48/80 (hydrochloride)
21379	Cromolyn (sodium salt hydrate)
23994	Lodoxamide

## Phosphodiesterase Inhibitors

Item No.	Product Name
14832	Ibudilast
15141	Roflumilast
10011132	Rolipram
10008671	Sildenafil

Over 10 PDE inhibitors as well as related adenosine receptor antagonists available online

## $\beta$ -Adrenergic Receptor Agonists

Item No.	Product Name
14985	Clenbuterol (hydrochloride)
15584	Formoterol (hemifumarate)
16009	Salmeterol (xinafoate)

Over 10  $\beta$ -adrenergic receptor agonists available online

## Antihistamines

Item No.	Product Name
16967	Astemizole
14637	Clemastine (fumarate)
15625	Loratadine
14615	Meclizine (hydrochloride)

Over 30 histamine receptor antagonists and/or inverse agonists available online

## Conveniently Detect Histamine

### Histamine EIA Kit - Item No. 589651

- Measure histamine in plasma, serum, bronchoalveolar lavage, tissue extracts, and cell culture supernatant samples
- Assay 33 samples in duplicate
- **Incubation:** Overnight

Manufactured by 

# Autoimmunity



Autoimmune disorders, such as rheumatoid arthritis and systemic lupus erythematosus, are tied to post-translational modifications of proteins, specifically citrullination and carbamylation. Cayman offers a unique collection of tools to study citrullination and carbamylation. This includes citrullinated histones and citrullinated human fibrinogen as well as key detection antibodies. Protein arginine deiminase (PAD) ELISAs, recombinant proteins, antibodies, and inhibitors are also available.

## Citrullinated Histones and Related Reagents

Item No.	Product Name
20582	Citrullinated Core Histones (bovine)
17926	Citrullinated Histone H3 (human recombinant)
501620	Citrullinated Histone H3 (Clone 11D3) ELISA Kit
18073	Histone H1.4 (Citrullinated R53) Polyclonal Antibody
17939	Histone H3 (Citrullinated R2 + R8 + R17) Monoclonal Antibody
17855	Histone H3 (Citrullinated R2 + R8 + R17) Polyclonal Antibody

## Citrullinated Fibrinogen and Related Reagents

Item No.	Product Name
18473	Human Fibrinogen (PAD2 Citrullinated)
400076	Human Fibrinogen (PAD4 Citrullinated)
501270	Anti-Citrullinated Human Fibrinogen Assay Kit (mouse)
23000	Citrullinated $\alpha$ -Enolase Monoclonal Antibody (Clone 8D3)
17088	Citrullinated Fibrinogen Monoclonal Antibody (Clone 10E9.3)
22054	Citrullinated Vimentin Monoclonal Antibody (Clone 12G11)

## Detect Carbamylated Proteins

### Anti-Carbamylation (Homocitrulline) Polyclonal Antibody - Item No. 22428

Specifically detects carbamylated proteins of any type and from any species

*Also available: Anti-Carbamylation (Homocitrulline) Monoclonal Antibody (Item No. 23203) and carbamylation reagents*

## PAD Inhibitors

Item No.	Product Name
17079	BB-CI-Amidine
17489	GSK199 (hydrochloride)
17488	GSK484 (hydrochloride)
17731	YW3-56 (hydrochloride)

## PAD ELISAs

Item No.	Product Name
501450	PAD2 (human) ELISA Kit
501460	PAD4 (human) ELISA Kit
500930	PAD4 Autoantibody ELISA Kit

## Recombinant PAD Proteins

Item No.	Product Name
10784	PAD1 (human recombinant)
10785	PAD2 (human recombinant)
10786	PAD3 (human recombinant)
10500	PAD4 (human recombinant)

## PAD Monoclonal Antibodies

Item No.	Product Name
22997	PAD1 Monoclonal Antibody (Clone 6B4)
19822	PAD2 Monoclonal Antibody (Clone 9F7)
24377	PAD3 Monoclonal Antibody (Clone 4E5)
19671	PAD4 Monoclonal Antibody (Clone 11F9)
19669	PAD4 Monoclonal Antibody (Clone 6D8)

## Screening Assays for Identifying Inhibitors of PAD Activity

A set of assays to enable the screening of large libraries of compounds for the next generation of PAD inhibitors

*Kits available for PAD1, 2, 3, and 4 in ammonia and AMC formats*

# Immunotherapeutics

Cayman offers Human Therapeutic IgG1, IgG2, and IgG4 ELISA Kits for use in accurately measuring human IgG species in monkey or rodent plasma and serum. These assays can help distinguish experimentally introduced human IgG from endogenous monkey IgG when assessing the pharmacokinetics of human therapeutic antibodies in monkey serum.



Validated ELISA kits for pharmacokinetic analysis of therapeutic human antibodies

- Specifically detect human IgG1, IgG2, or IgG4 antibodies in monkey plasma or serum without prior sample purification
- Not cross reactive to rhesus or cynomolgus immunoglobulins
- Pharmacokinetic analysis of therapeutic human IgG1, IgG2, or IgG4 antibodies in monkeys
- Detect human IgG1, IgG2, or IgG4 in mouse or rat plasma or serum

**Human Therapeutic IgG1  
ELISA Kit - Item No. 500910**

Assay Range: 3.13-200 ng/ml

LLOQ = 3.13 ng/ml

**Human Therapeutic IgG2  
ELISA Kit - Item No. 500960**

Assay Range: 3.13-200 ng/ml

LLOQ = 3.13 ng/ml

**Human Therapeutic IgG4  
ELISA Kit - Item No. 500920**

Assay Range: 7.8-500 ng/ml

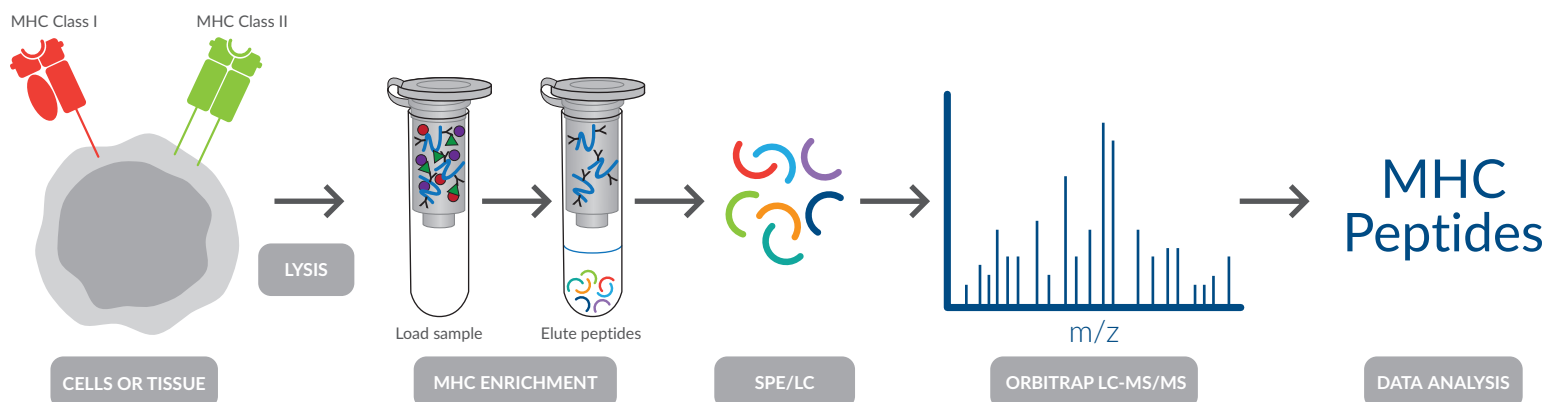
LLOQ = 7.8 ng/ml

# Adaptive Immunity

Immuno-peptidome Profiling Services

Cayman, in partnership with MS Bioworks, has optimized a workflow to enable MHC Class I and MHC Class II Associated Peptide Proteomics (MAPPs). Our collective expertise provides efficient, cost-effective deep sequence analysis of immunogenic peptides from tumor cells and biological therapeutics.

- Identification of thousands of MHC-associated peptides
- Allele-specific studies matched to your specifications
- Analysis using Orbitrap MS and unbiased, deep sequencing of the MHC peptidome
- Customized antibody production, cell culture, and bioanalysis



# Innate Immunity

Innate immunity is a key defense system activated in response to bacterial and viral infections. Cayman offers a collection of tools to study host defense mechanisms that includes chemokine receptor and toll-like receptor modulators, phagocytosis and neutrophil extracellular trap assays, and proteins involved in STING signaling and the induction of the type 1 interferon (IFN) response.

## Chemokine Receptor Modulators

Item No.	Product Name
11189	N-acetyl-Pro-Gly-Pro Peptide
17359	Antileukinate
11479	Bindarit
11960	FC 131
11963	INCB 3284 (dimesylate)
14641	Maraviroc
21492	Reparixin (L-Lysine salt)
17330	RS 504393
13336	SB 225002
11974	TC 14012
17739	UNBS5162
19812	VUF 11207 (trifluoroacetate salt)

Over 20 chemokine receptor agonists, antagonists, and inverse agonists available online

## Phagocytosis Assay Kits

Item No.	Product Name
500290	Phagocytosis Assay Kit (IgG FITC)
601480	Phagocytosis Assay Kit (IgG-DyLight™ 405)
601490	Phagocytosis Assay Kit (IgG-DyLight™ 633)
600540	Phagocytosis Assay Kit (IgG PE)
601370	<i>E. coli</i> Phagocytosis Assay Kit

## CD36 Scavenger Receptor Antibodies

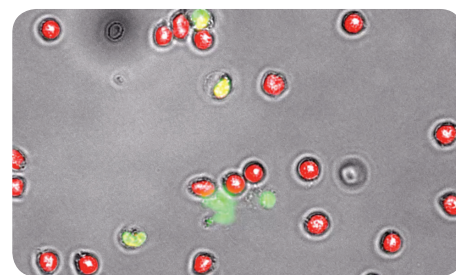
Item No.	Product Name
188150	CD36 Monoclonal Antibody (Clone JC63.1)
10009893	CD36 Monoclonal Antibody (Clone JC63.1) (azide free)
10009870	CD36 Monoclonal FITC Antibody (Clone JC63.1)
100011	CD36 Polyclonal Antibody

## Visualize NET Formation

### NETosis Imaging Assay Kit - Item No. 601750

A two-color, live-cell, image-based assay to monitor and quantify NETosis kinetics

Watch the time-lapse video at [www.caymanchem.com/news/imageNETs](http://www.caymanchem.com/news/imageNETs)



**Neutrophil Extracellular Traps (NETs)** release DNA, histones, and other antimicrobial components extracellularly to capture and kill pathogens. This may be initiated by respiratory burst, MPO-induced chromatin decondensation, and histone deimination. If not cleared properly, NETs can be a target of autoantibody formation.

## Antibodies

Item No.	Product Name
15635	dsDNA Monoclonal Antibody (Clone 2C4)
13784	Histone H3.3 Polyclonal Antibody (Also available: 13535, 13543)
15637	LL-37 Polyclonal Antibody
15641	Lysozyme C Monoclonal Antibody (Clone 4C3)
20493	Myeloperoxidase (mouse) Polyclonal Antibody (Also available: 15638, 15639, 15640)

## Assay Kits

Item No.	Product Name
501410	Myeloperoxidase (human) ELISA Kit
601010	NETosis Assay Kit
600610	Neutrophil Elastase Activity Assay Kit
600620	Neutrophil Myeloperoxidase Activity Assay Kit
601130	Neutrophil/Monocyte Respiratory Burst Assay Kit
601070	Neutrophil (mouse) Isolation Kit

# Innate Immunity (continued)



## STING and Interferon Induction

Directly measure 2'3'-cGAMP with unrivaled sensitivity

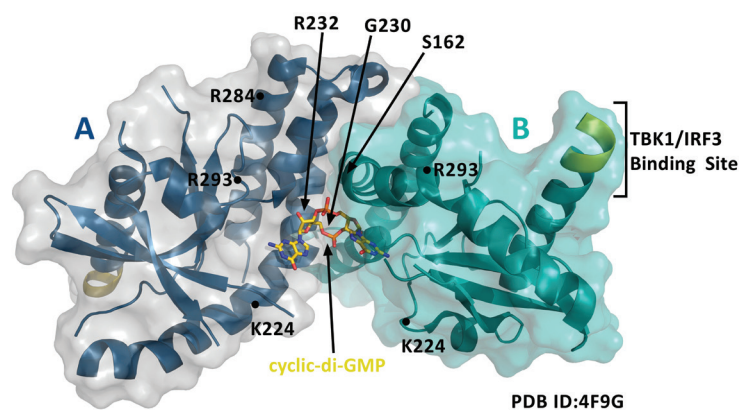
### 2'3'-cGAMP ELISA Kit - Item No. 501700

- Measure 2'3'-cGAMP in cell lysates down to 85.3 pg/ml
- Monitor the kinetics of 2'3'-cGAMP formation and hydrolysis in a biological setting
- Identify compounds that modulate cGAS activity by monitoring cGAMP levels

## 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 about how amino acid variations affect innate immune response to foreign DNA at [www.caymanchem.com/STINGvariants](http://www.caymanchem.com/STINGvariants)



STING dimer (A and B are both aa 139-379) bound to cyclic-di-GMP and notated with key amino acid modifications of Cayman's STING variants.

## Upstream/Downstream Proteins in the STING Pathway

Item No.	Product Name
22810	cGAS (human recombinant)
25001	cGAS (161-522) (human recombinant)
22809	CdnP ( <i>Mycobacterium tuberculosis</i> strain ATCC 25618/ H37Rv recombinant)
22817	TBK1 (human recombinant)
22811	IRF3 (human recombinant)
23590	IRF3 (S386A, S396A mutant; human recombinant)

## cGAS, STING, IRF3, and IKK $\gamma$ Antibodies

Item No.	Product Name
23853	cGAS Monoclonal Antibody (Clone 5G10)
17856	STING Monoclonal Antibody (Clone 2C8)
17857	STING Polyclonal Antibody
24791	STING M284 variant Polyclonal Antibody
24937	IRF3 Polyclonal Antibody
13931	IKK $\gamma$ Monoclonal Antibody (Clone 72C627)

## Toll-Like Receptors

### Antibodies

Item No.	Product Name
13582	Toll-Like Receptor 1 Polyclonal Antibody
13587	Toll-Like Receptor 2 Monoclonal Antibody (Clone TL2.1)
13589	Toll-Like Receptor 4 Monoclonal Antibody (Clone HTA125)
13593	Toll-Like Receptor 9 Monoclonal Antibody (Clone 26C593.2)

Additional antibodies are available online

### Agonists and Pathogen-Associated Molecular Patterns

Item No.	Product Name
14956	Imiquimod
19661	LPS from <i>Escherichia coli</i> O111:B4
24126	Pam <sub>3</sub> CSK <sub>4</sub> (trifluoroacetate salt)
14806	R-848

Additional agonists and inhibitors are available online

# Microbiome

The microbiota provides crucial signals for the development and function of the immune system. Specific alteration of microbial metabolites is increasingly being shown to be involved in inflammatory disease processes. Research is emerging on the role of both short-chain fatty acids (SCFAs) and the bile acid-gut microbiome axis in health and disease. Cayman offers a wide range of primary and secondary bile acids, SCFAs, polyamines, and additional related metabolites for this important area of research.



## Primary and Secondary Bile Acids

Item No.	Product Name
10011286	Chenodeoxycholic Acid
20250	Cholic Acid
22670	Glycohyocholic Acid
22643	Glycohyodeoxycholic Acid
20287	$\beta$ -Muricholic Acid
20290	Murideoxycholic Acid
22669	Taurohyocholate
20289	Tauro- $\beta$ -muricholic Acid (sodium salt)
15121	Ursodeoxycholic Acid (sodium salt)

*Over 25 primary and secondary bile acids available online*

## Dietary Conjugated Linoleic Acids

Item No.	Product Name
90370	9(E),11(E)-Conjugated Linoleic Acid
90140	9(Z),11(E)-Conjugated Linoleic Acid
90145	10(E),12(Z)-Conjugated Linoleic Acid

## Additional Metabolite-Type Products

Item No.	Product Name
10112	( $\pm$ )-Enterolactone
10010173	(S)-Equol
14918	Spermidine
17354	Trimethylamine N-oxide

# Quorum Sensing

Cayman provides a diverse set of homoserine lactones that can be used to study how bacterial populations use quorum sensing signaling to coordinate their behavior as cell population density increases. This promising field of research works to discover effective ways to control bacterial infections by quenching their quorum sensing systems.

## Homoserine Lactones

Item No.	Product Name
10007898	N-butyryl-L-Homoserine lactone
10007896	N-hexanoyl-L-Homoserine lactone
10011199	N-octanoyl-L-Homoserine lactone
10007895	N-3-oxo-dodecanoyl-L-Homoserine lactone
10011207	N-( $\beta$ -ketocaproyl)-L-Homoserine lactone

*Common compounds listed, over 30 homoserine lactones and their internal standards available online*

## CONTACT US

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