

# Toxicology

Cayman offers a wide range of tools to help study the chemical and biological aspects of the toxic response and the mechanisms involved in carcinogenicity, organ toxicity, clinical drug metabolism, environmental toxicity, and food contamination.

- Assays and probes to assess mitochondrial function and profile for compound toxicity
- Assays, inhibitors, and fluorogenic probes to study CYP450 catalytic activity
- Nuclear receptor cell-based reporter assays, agonists, and antagonists to study xenobiotic sensing and detoxification
- Validated human therapeutic IgG ELISAs for preclinical toxicology assessment of candidate pharmaceuticals
- Assays, analytical standards, and research tools to measure endocrine disruption and environmental toxins
- Assays to monitor cell viability, proliferation, apoptosis, and cytotoxicity



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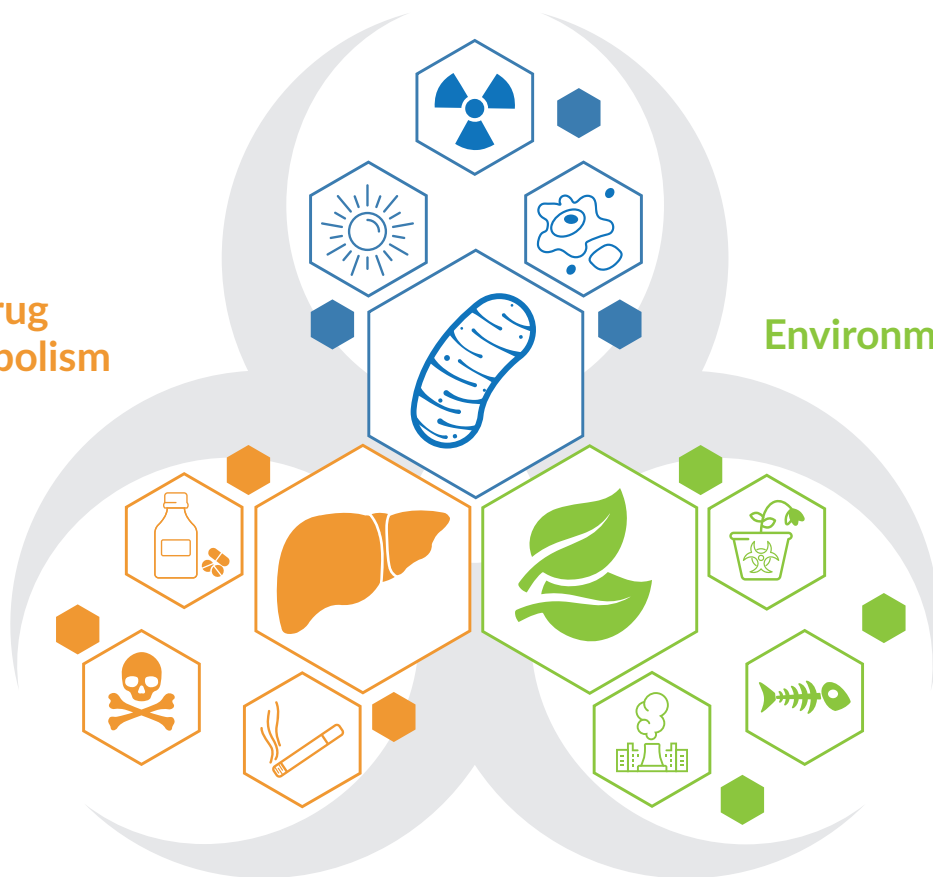
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Cell Health

## Mitochondrial Health

Drug  
Metabolism

Environment



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# Mitochondrial (Dys)Function



Monitor mitochondrial function and profile for compound toxicity using Cayman's unique series of MitoCheck® assays. These kits are designed as a series of functional assays to measure electron transport chain (ETC) activity in isolated mitochondria and screen compounds for potential ETC inhibition. A series of screens are also available that focus on mitochondrial function at the level of

and detoxification.

## MitoCheck® – Activity Assay Kits

- Do not require expensive equipment or lengthy incubations
- Adapted for use with microplate readers
- Amenable to high-throughput screening

Item No.	Product Name
701040	MitoCheck® Citrate Synthase Activity Assay Kit*
700930	MitoCheck® Complex I Activity Assay Kit*
700940	MitoCheck® Complex II Activity Assay Kit*

Item No.	Product Name
700950	MitoCheck® Complex II/III Activity Assay Kit*
700990	MitoCheck® Complex IV Activity Assay Kit*
701000	MitoCheck® Complex V Activity Assay Kit*

\*MitoCheck® Mitochondrial (Tissue) Isolation Kit (Item No. 701010) available to aid in mitochondrial tissue isolation

## Mitochondrial Inner Membrane Permeability Assay

Measure inner mitochondrial membrane integrity and mitochondrial membrane potential by multiplexing a calcein/cobalt technique with TMRE

Item No.	Product Name
601430	Mitochondrial PT Pore Assay Kit

## Reactive Oxygen Species (ROS) Detection Assays

Measure superoxide and hydrogen peroxide levels in living cells

Item No.	Product Name
601520	ROS Detection Cell-Based Assay Kit (DCFDA)
601290	ROS Detection Cell-Based Assay Kit (DHE)

## ETC Inhibitors

Item No.	Product Name
22415	Annonacin
19433	Antimycin A <sub>1</sub>
19620	Harzianopyridone
15159	HQNO
14684	3-Nitropropionic Acid
19162	Oligomycin C

## Mitochondria-Targeted Probes to Study ROS Generation and Detoxification

Each compound contains the lipophilic triphenylphosphonium cation component, which enables passage through lipid bilayers and accumulation in mitochondria

Item No.	Product Name
22702	MitoA
17116	MitoB*
17117	MitoP*
18798	MitoPerOx
18808	MitoPQ
16621	MitoTEMPO (hydrate)
18796	MitoTEMPOL

\*Stable isotope-labeled ratiometric probes are also available

Item No.	Product Name
15379	Piericidin A
13995	Rotenone
20982	S1QEL
18556	S3QEL-2
15517	2-Thenoyltrifluoroacetone
16980	UK 5099

# Drug Metabolism

Cayman offers assays, inhibitors, and fluorogenic probes to study changes in cytochrome P450 (CYP450) catalytic activity caused by xenobiotics or disease. Our scientists have designed a unique set of reporter assays to enable early screening during the drug development process to help determine a drug candidate's potential to induce or inhibit critical CYP450 isoforms.

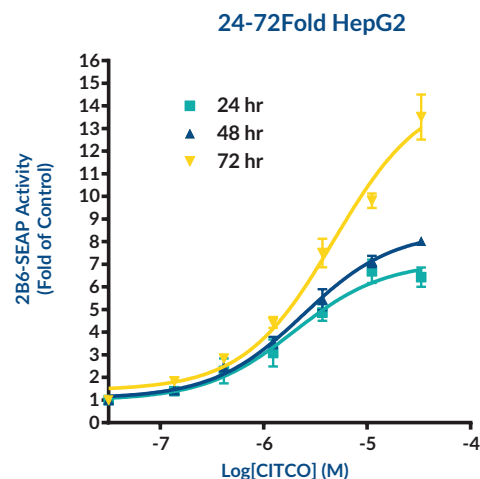


## Cytochrome P450 Induction Assays

### CYP2B6 Induction Reporter Assay Kit - Item No. 600680

- A 96-well plate coated with DNA encoding a CYP2B6 promoter-regulated reporter enzyme (SEAP) and two nuclear receptors, hCAR3 and HNF4 $\alpha$
- Cells grown on the complex will express the two nuclear receptors and the CYP2B6 promoter-regulated SEAP
- CAR-mediated CYP2B6 inducers will activate SEAP expression
- SEAP secreted into the supernatant cleaves a luminescence-based substrate

More CYP450 Induction Assays available online



## CYP450 Inhibitors and Reagents

Item No.	Product Name
10018	DDMS
16808	Dibenzylfluorescein
16122	7-Ethoxyresorufin
19760	6',7'-Epoxybergamottin
31570	12(S)-hydroxy-16-Heptadecyonic Acid
75780	HET0016
19851	Isoimperatorin

Item No.	Product Name
75770	MS-PPOH
90270	17-Octadecyonic Acid
15019	PF-04981517
75760	PPOH
15040	SKF 525A (hydrochloride)
10008517	Tienilic Acid
10038	TMS

Over 20 CYP450 inhibitors available online

## CYP450 Fluorescent Probes

Item No.	Product Name	Substrate	Excitation Maximum (nm)	Emission Maximum (nm)
16808	Dibenzylfluorescein	CYP3A4, CYP2C8, CYP2C9, CYP2C19, and aromatase (CYP19)	■ 485	■ 538
19586	7-ethoxy-4-Methylcoumarin	CYP1A1, CYP2B4, and CYP2B6	■ 318 (methanol) ■ 360 (dealkylase)	■ 377 (methanol) ■ 449 (dealkylase)
16122	7-Ethoxyresorufin	CYP1A1	■ 535	■ 590
18077	Resorufin benzyl ether	CYP3A4	■ 571	■ 585

# Drug Metabolism *(continued)*

Cayman's line of agonists and antagonists can be used to study the nuclear receptors involved in xenobiotic sensing and detoxification. This includes tools to examine signaling at the aryl hydrocarbon receptor (AhR), whose ligands include some of the most infamous xenobiotics, and the pregnane X receptor (PXR) and constitutive androstane receptor (CAR), which each play a major role in regulating the gene expression of phase I, II, and III drug-metabolizing enzymes.



## Xenobiotic Sensing

### AhR Agonists and Antagonists

Item No.	Product Name
10006545	CAY10464
10006546	CAY10465
16154	CH 223191
18649	Diosmetin
17677	5-fluoro 203
15948	Galangin
16924	$\alpha$ -Naphthoflavone
10006342	PDM 2
10006341	PDM 11
15342	Phortress
70675	<i>trans</i> -Resveratrol
10188	<i>trans</i> -trismethoxy Resveratrol

Over 15 AhR agonists and antagonists available online


### PXR and CAR Agonists and Antagonists

Item No.	Product Name
16027	CITCO
15728	Dehydroepiandrosterone
15212	Ketoconazole
16343	Pregnenolone Carbonitrile
14423	Rifampicin
18115	SR-12813
14140	TCPOBOP

### Nuclear Receptor Cell-Based Assay Kits

Item No.	Product Name
16523	AhR (human) Assay Kit
17528	Pregnane X (human) Receptor Assay Kit
15748	CAR1 (human) Reporter Assay Kit
15747	CAR3 (human) Reporter Assay Kit <b>Also Available:</b> Mouse Constitutive Androstane Receptor Reporter Assay System - Item No. 18812

Over 40 nuclear receptor cell-based assay kits available online

Manufactured by  **INDIGO**  
BIOSCIENCES  
The Nuclear Receptor Experts

# Human Therapeutic IgG1/IgG2/IgG4 ELISA Kits

*Validated ELISAs for pharmacokinetic analysis of therapeutic human antibodies*

- Accurately measure human IgG1, IgG2, or IgG4 in monkey or rat serum
- Will not detect monkey or rat IgGs
- No purification required
- Low intra- and inter-assay variability
- Low ng/ml sensitivity

Item No.	Product Name
500910	Human Therapeutic IgG1 ELISA Kit
500960	Human Therapeutic IgG2 ELISA Kit
500920	Human Therapeutic IgG4 ELISA Kit

# Environmental Toxicology

Cayman's collection of steroid assay kits can be used to quantify key biomarkers in plasma and other sample matrices to help identify alterations in endocrine function. Industrial pollutants with known estrogenic effects, as well as reactive metabolites of certain estrogen modulating drugs are also available.



## Endocrine Disruption

### Estrogenic Chemicals and other Endocrine Disruptors

Item No.	Product Name
70790	BADGE
18655	4- <i>tert</i> -Octylphenol diethoxylate
13840	4-Methylbenzylidene camphor
17204	$\alpha$ -hydroxy Tamoxifen
19519	4'-hydroxy Tamoxifen
11353	Zearalenone
16549	$\alpha$ -Zearalenol
23424	$\alpha$ -Zearalanol
19460	$\beta$ -Zearalenol

### Steroid Hormone Assays

Item No.	Product Name
582251	Estradiol ELISA Kit
582701	Testosterone ELISA Kit
582601	Progesterone ELISA Kit
501290	Estrone-3-Glucuronide ELISA Kit
501420	11-Oxoetiocholanolone ELISA Kit

## Endocrine Disruption Biomarkers in Fish Species

Cayman offers antibodies and assays to detect common biomarkers for oestrogenic, anti-androgenic, xenobiotic, or heavy metal pollutant exposure.

### Semi-quantitative detection of pollutant exposure from fish plasma

#### ELISAs

Item No.	Product Name
10009272	Vitellogenin (salmonid) Semi-Quantitative ELISA Kit
10004993	Vitellogenin (carp) ELISA Kit
10004994	Vitellogenin (rainbow trout) ELISA Kit
10004995	Vitellogenin (zebrafish) ELISA Kit

Item No.	Product Name
10006943	Vitellogenin (fathead minnow) ELISA Kit
10009223	Vitellogenin (medaka) ELISA Kit
10007680	Semi-Quantitative Biomarker ELISA Component Kit For Fish Samples (anti-mouse plate)
10008659	Semi-Quantitative Biomarker ELISA Component Kit For Fish Samples (anti-rabbit plate)

#### Antibodies

Item No.	Product Name
100012	Vitellogenin (Japanese medaka) Monoclonal Antibody (Clone CK-4B3)
170100	Vitellogenin (sheepshead minnow) Monoclonal Antibody (ND-5C9)
170101	Vitellogenin (brown bullhead) Monoclonal Antibody (ND-1D12)
170107	Vitellogenin (striped bass) Monoclonal Antibody (ND-3G2)
170115	Vitellogenin (carp) Monoclonal Antibody (ND-2D3)
170120	Vitellogenin (Arctic char) Polyclonal Antibody (PO-1)

Item No.	Product Name
170130	Vitellogenin (cod) Polyclonal Antibody (CS-1)
170145	Vitellogenin (salmon) Monoclonal Antibody (BN-5)
170150	Vitellogenin (sea bream) Polyclonal Antibody (PO-2)
170165	Vitellogenin (zebrafish) Monoclonal Antibody (JE-2A6)
170170	Vitellogenin (turbot) Polyclonal Antibody (CS-2)
170265	Vitellogenin (sturgeon) Monoclonal Antibody (ND-1H2)

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LABORATORIES

# Environmental Toxicology *(continued)*

We offer a variety of mycotoxins and microcystins (common food or water contaminants) as well as herbicides and pesticides that can be used as analytical standards to address a wide array of research questions related to cytotoxicity and xenobiotic metabolism. Ask about bulk, custom standards, and custom mixtures to assist your food and water quality testing.



## Food & Water Safety

### Mycotoxins

Item No.	Product Name
11295	Aflatoxin G <sub>1</sub>
11296	Aflatoxin G <sub>2</sub>
11297	Aflatoxin M <sub>1</sub>
20437	Aflatoxin R <sub>0</sub>
19405	Chaetoglobosin A
17876	Fusaric Acid

Item No.	Product Name
62580	Fumonisin B <sub>1</sub>
13227	Fumonisin B <sub>2</sub>
20434	Fumonisin B <sub>3</sub>
20431	HT-2 Toxin
11439	Ochratoxin A

More than 20 mycotoxin standards available on [www.caymanchem.com](http://www.caymanchem.com)

### Microcystins and other Algal Bloom Toxins

Item No.	Product Name
10011498	Brevetoxin B
10007867	Cylindrospermopsin
10007187	Microcystin-LA

Item No.	Product Name
10007188	Microcystin-LR
10007868	Microcystin-RR
10007190	Nodularin

## Amnesic Shellfish Poison ELISA

### ASP EIA kit - *Item No. 10008673*

- A specific assay for domoic acid (DA), a neurotoxin produced by produced by Pseudo-nitzschia
- Intended for use in routine monitoring of DA levels in bivalve molluscs to comply with the regulatory MPL
- Also applicable for DA quantification in other marine matrices

### Herbicides & Pesticides

Item No.	Product Name
18466	Aldicarb
13375	Atrazine
17404	Endothall
16675	Glufosinate (ammonium salt)

Item No.	Product Name
20341	Nitrofen
11442	Tentoxin
15601	Thaxtomin A

More than 20 herbicides & pesticides standards available on [www.caymanchem.com](http://www.caymanchem.com)

# Cell Health

The range of cell-based assays available from Cayman is designed to give you the flexibility and efficiency needed to monitor cell viability, proliferation, oxidative damage, apoptosis, and/or cytotoxicity. Performed in a biologically relevant context, these cell-based assays offer the ability to detect perturbations in cellular function following treatment with a compound of interest.



## Cell Death or Proliferation Assays

Item No.	Product Name	Measure	Readout	Methodology	Time to Results
10009853	CFSE Cell Division Assay Kit	Cell proliferation	Flow cytometer	Uses CFSE dilution to detect up to eight cell divisions in activated lymphocytes	<1 hour to label, variable incubation, <1 hour to prep samples for flow cytometry
601170	LDH Cytotoxicity Assay Kit	Non-apoptotic cell ceath	Colorimetric plate reader	Reduces INT as an indicator of the amount of LDH released into supernatant by dying cells; detects 10,000-200,000 cells per well	1.5 hours
10009365	MTT Cell Proliferation Assay Kit	Cell proliferation / Viability	Colorimetric plate reader	Reduces MTT to insoluble, purple formazan by NAD(P)H-oxidoreductases in living cells; detects 10,000-250,000 cells per well	3-4 hours
601280	Multi-Parameter Apoptosis Assay Kit	Apoptosis	Flow cytometer Fluorescence plate reader Fluorescence microscope	Uses Annexin V FITC and 7-AAD staining to differentiate apoptosis and necrosis while using TMRE to indicate mitochondrial membrane potential	1 hour staining protocol
10008883	WST-1 Cell Proliferation Assay Kit	Cell proliferation / Viability	Colorimetric plate reader	Reduces WST-1 to soluble, purple formazan by extracellular NADH from living cells; detects 1,000-200,000 cells per well	2-4 hours
10010199	WST-8 Cell Proliferation Assay Kit	Cell proliferation / Viability	Colorimetric plate reader	Reduces WST-8 to soluble, purple formazan by extracellular NADH from living cells; detects 2,000-500,000 cells per well	2-4 hours
10010200	XTT Cell Proliferation Assay Kit	Cell proliferation / Viability	Colorimetric plate reader	Reduces XTT to purple formazan by extracellular NADH from living cells; detects 500-100,000 cells per well	4 hours

### Glyco-SPOT DNA Repair Assay Kit - Item No. 501280

- Profile glycosylase/AP endonuclease activities
- HTS friendly, fluorescent microarray
- Sample Types: Pure Enzyme | Cell Nuclear Extracts | Whole Cell Extracts | Tissue Extracts
- Species Compatibility: Human | Mouse | Rat | Fish | Bacteria

This assay can be used to screen for DNA repair inhibitors, characterize DNA repair enzymatic signatures from samples, check DNA glycosylase specificity, and characterize DNA repair inhibitory properties of chemicals (i.e. heavy metals).

Produced by



Learn more about how apoptosis and cell death can affect your research in Cayman's *Guide to Apoptosis Assays* by visiting [www.caymanchem.com/literature](http://www.caymanchem.com/literature)



To view a complete list of our nitric oxide and oxidative injury products, visit us online at [www.caymanchem.com](http://www.caymanchem.com)

# Services

## Bioanalysis & Assay Development Services

Cayman's Bioanalytical Division offers a wide range of services to accelerate discovery and pre-clinical development initiatives. Our scientific staff has decades of industry expertise in assay and methods development, sample preparation, and analysis. We consult with you from project kickoff to conclusion on experimental design and data analysis to ensure you meet your objectives. Select from our catalog of well characterized assays, qualified commercially available assays, or let our experts design a custom assay that suits your specific requirements. Our team regularly develops plate-based, mass spectrometry-based, cell-based, and flow cytometry assays.



### Sample Analysis

- Biomarker profiling
- Activity screening
- Lipidomic profiling
- Immunopeptidome profiling
- Proteomic profiling and PTM analysis
- Mitochondrial/bioenergetics profiling

### Custom Assay Development

- Immunoassays
- Mass spectrometry-based assays
- Enzyme activity assays
- Cell-based assays
- Reporter assays

*Contact us to learn more about these services or discuss how our team can provide solutions and complement your internal programs.*

## CONTACT US

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