

# Fluorescent Dyes

- Rich Variety
- High Fluorescence Quantum Yield
- Good Stability
- High Quality Assurance

Organelle Dyes

Cell Viability Dyes

Protein Labeling Dyes

In Vivo Imaging Dyes

Apoptosis Dyes

Fluorescent Labeling Service

# ABOUT US

MedChemExpress (MCE) is a globally premier brand in life sciences, offering a spectrum of high-purity small molecules, highly active large molecules, and a diverse array of widely utilized biological reagents and assay kits. Additionally, MCE provides scientists worldwide with comprehensive technical services, including One-stop drug screening and compound customization.

We have a technologically strong R&D team, a rigorous quality control system, and provide our customers with 24/7 professional and thoughtful service. MCE always adheres to serving scientific research with stable, high-quality products and cutting-edge solutions, dedicated to promoting progress in human scientific research and pharmaceutical development. We are the master of biologically active molecules by your side!







### Strict Quality System

- Equipped with a professional experimental center and strict quality control system
- Provide various quality inspection reports such as HNMR, LC/MS, HPLC, chiral analysis, elemental analysis, SDS-PAGE, SEC-HPLC, activity detection, etc



### Biological Activity Verification

- The biological activity and experimental effects of the product have been verified by customers around the world, and the scientific research results have been widely included in the world's top journals



### Professional and Considerate Service

- Experienced technical support team
- 24/7 Response
- Sufficient spot reserves

## TOP PUBLICATIONS CITING USE OF MCE PRODUCTS

Nature. 2024 Feb;626(7998):411-418.

Nature. 2024 Feb;626(8000):874-880.

Nature. 2023 Dec;624(7991):442-450.

Nature. 2023 Dec;624(7991):425-432.

Nature. 2023 Dec;624(7992):672-681.

Nature. 2023 Oct;622(7981):173-179.

Nature. 2023 Oct;622(7981):139-148.

Nature. 2023 Sep;621(7977):188-195.

Cell. 2024 Feb 29;187(5):1223-1237.e16.

Cell. 2024 Feb 15;187(4):882-896.e17.

Cell. 2024 Feb 1;187(3):712-732.e38.

Cell. 2024 Feb 1;187(3):624-641.e23.

Cell. 2024 Feb 1;187(3):609-623.e21.

Cell. 2024 Jan 18;187(2):294-311.e21.

Cell. 2024 Jan 4;187(1):166-183.e25.

Cell. 2024 Jan 4;187(1):44-61.e17.

Science. 2024 Feb 2;383(6682):eadh4859.

Science. 2023 Sep 22;381(6664):eadi3448.

Science. 2023 Jun 9;380(6649):eabo2296.

Science. 2022 Dec 2;378(6623):eabo5503.

Science. 2022 Nov 18;378(6621):eabq7361.

Science. 2022 Oct 14;378(6616):eabq0132.



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# ORGANELLE ASSAYS



Organelles are microstructures within cells with specific shapes, structures, and functions. They are functional units responsible for performing normal cellular operations, ranging from generating energy for cells to controlling cell growth and reproduction<sup>[1]</sup>. Choosing the right organelle dye/probe to **detect a specific organelle** is key to cell detection, and MCE offers a variety of organelle fluorescent probes to illuminate your microscopic world.

Application	Cat. No.	Product Name	Ex (nm)	Em (nm)
Cytoskeleton	HY-D1817	Vari Fluor 488-Phalloidin	488	513
	HY-D1820	Vari Fluor 594-Phalloidin	585	609
Endoplasmic Reticulum	HY-D1297	ER-Tracker Green	489	520
	HY-D1431	ER-Tracker Red	587	615
Lysosome	HY-D1296	Green DND-26	482	512
	HY-D1300	LysoTracker Red	577	590
Golgi Apparatus	HY-D1612	BODIPY FL C5-Ceramide	505	511
	HY-D1735	BODIPY TR Ceramide	589	616
Mitochondria	HY-135056	MitoTracker Green FM	490	523
	HY-D1783	MitoTracker Deep Red FM	644	665
Nucleus	HY-15619	Hoechst S 769121	356	451
	HY-15563	HOE 33187	356	451
Cell Membrane	HY-D0083	Dil	549	565
	HY-D1434	FM1-43	510	626
Lipid Droplet	HY-W090090	BODIPY 493/503	493	503
	HY-D0718	Nile Red	530	635
Exosome	HY-D1451	PKH 26	551	567
	HY-D1421	PKH 67	490	502

# CELL VIABILITY ASSAYS

Cell proliferation is a fundamental physiological process in living cells, representing a critical life feature in organisms. It serves as the cornerstone for growth, development, reproduction, and heredity<sup>[2]</sup>. Proliferation assays systematically analyze **number changes of dividing cells**, reflecting the growth status and cellular activity.

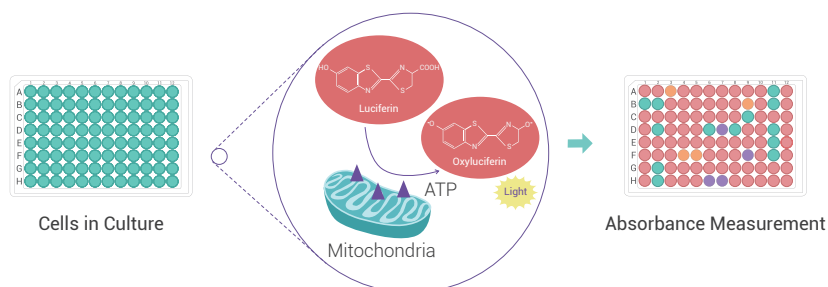


Figure 1. CTG Cell Viability/Proliferation Detection.

Cat. No.	Product Name	Ex (nm)	Em (nm)	Description
HY-15924	MTT	/	570	Live cell viability assay: employs water-soluble tetrazolium salt dye, wherein succinate dehydrogenase in cellular mitochondria can reduce exogenous tetrazolium salt to water-insoluble blue-violet crystalline filth and deposit it in the cells. Dead cells do not react.
HY-136976	WST-1	/	450	
HY-125921	WST-3	/	450	
HY-D0831	WST-8	/	450	
HY-K0302	CTG Cell Viability Detection Reagent	/	/	Quantification of ATP: based on highly sensitive bioluminescent assays to determine the number of live cells and cell viability in the culture.
HY-D0041	Calcein-AM	485	515	Cell activity/Cytotoxicity assay: calcein-AM produces bright green fluorescence in live cells but is insensitive to dead cells.
HY-D0938	CFDA-SE	485	515	Cell proliferation assay: CFSE dyes have the ability to penetrate living cell membranes. After entering cells, they are mainly located in the cytoplasm and nucleus and can be used for cell proliferation research.
HY-D0056	5-Carboxyfluorescein Diacetate N-succinimidyl Ester	492	517	
HY-D0815	Propidium Iodide	536	635	Dead cells assay: selectively and effectively penetrates compromised dead cell membranes, staining the cell nucleus specifically.
HY-D0093	Ethidium Homodimer	528	617	

# PROGRAMMED CELL DEATH

Programmed cell death (PCD) is a genetically orchestrated process of cellular suicide in multicellular organisms, vital for development, homeostasis, and overall integrity. PCD's exploration spans various fields, including immunity, neurodevelopment, cancer, and infection. Apoptosis, autophagy, pyroptosis, ferroptosis, and the recently identified cuproptosis constitute common PCD types, contributing to diverse areas of scientific inquiry<sup>[3]</sup>.

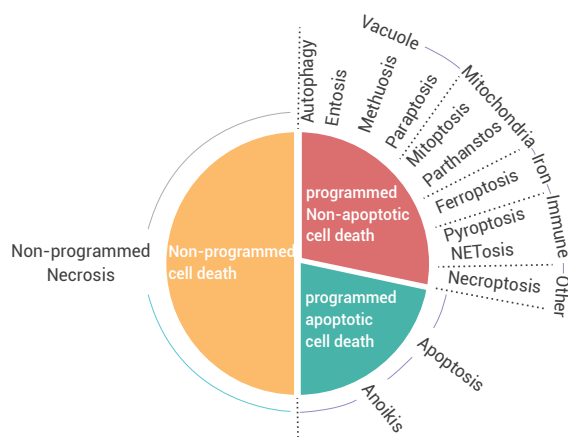


Figure 2. Summary of Different Types of Cell Death<sup>[4]</sup>.

## 01 Apoptosis

Apoptosis, a crucial form of programmed cell death, involves genetically controlled, autonomous, and orderly cellular demise, contributing to the maintenance of internal environment stability and the regulation of multicellular organisms. The apoptosis process encompasses chromatin condensation, cell membrane vesiculation, cell shrinkage, and the formation and cleavage of apoptotic vesicles<sup>[5]</sup>.

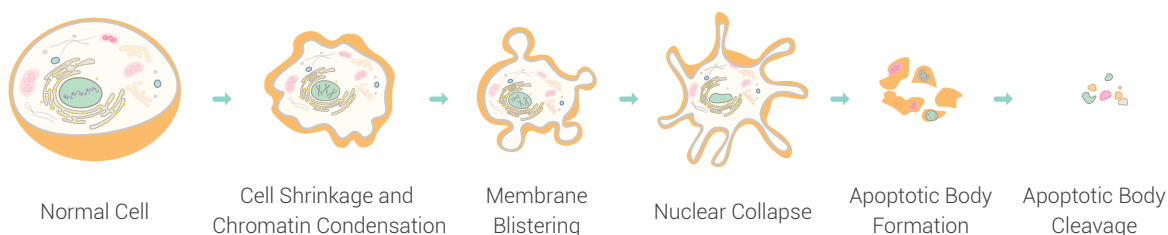


Figure 3. The Process of Apoptosis<sup>[6]</sup>.



## Apoptosis detection methods

Detection	Cat. No.	Product Name	Ex (nm)	Em (nm)	Description
Mitochondrial Membrane Potential Assay	HY-15534	JC-1	515/580	527/590	Mitochondria assume a crucial role in apoptosis, particularly early onset of apoptosis, mitochondrial membrane potential decreases, detection of mitochondrial membrane potential can determine the early onset of apoptosis.
	HY-D0985A	TMRE	550	576	
	HY-D0084	DiOC6(3)	486	515	
	HY-D0816	Rhodamine 123	507	529	
Caspases Detection Assay	HY-P1986	Z-DEVD-AFC	380	500	The Caspase family (Caspase-3 is a key executioner molecule) plays a crucial role in mediating apoptosis. Detection of Caspase-3 can determine the early/late stages of apoptosis.
	HY-P3363	Z-DEVD-AMC	360	450	
	HY-P1169	Ac-IETD-AFC	380	500	
	HY-P1003	Ac-DEVD-AMC	360	445	
Apoptosis Detection Kits	HY-K1073	Annexin V-FITC/PI Apoptosis Detection Kit	488/525	535/617	In co-staining with Annexin V-FITC and PI, normal cells exhibited minimal fluorescence. Early apoptotic cells displayed green fluorescence, and late apoptotic and necrotic cells showed green and red fluorescence.
	HY-K1075	Annexin V-PE Apoptosis Detection Kit	565	578	Phycoerythrin (PE)-labeled recombinant human Annexin V served as a tool for apoptosis detection. Apoptotic cells displayed distinctive red fluorescence.
	HY-K1076	Annexin V-mCherry Apoptosis Detection Kit	587	610	Red fluorescent protein mCherry-labeled binant human Annexin V can be used to detect apoptosis. There are minimal fluorescence in normal cells, while apoptotic cells emit distinctive red fluorescence.
	HY-K1077	Annexin V-mCherry/SYTOX Green Apoptosis Detection Kit	504/587	523/610	After co-staining with Annexin V mCherry and SYTOX Green, normal cells show minimal fluorescence, apoptotic cells exhibit red fluorescence, and necrotic cells display both red and green fluorescence.
	HY-K1078	One Step TUNEL Apoptosis Detection Kit (FITC)	488	525	Normal cells exhibit minimal fluorescence, while apoptotic cells emit a green fluorescence.

## 02 Ferroptosis

Ferroptosis, an iron-dependent programmed cell death (PCD), stands apart from apoptosis and autophagy. It relies on iron-mediated oxidative damage, and increased iron accumulation, generation of free radicals, supply of fatty acids and lipid peroxidation, all of which are important factors in ferroptosis induction. Monitoring changes in intracellular iron ion concentration and reactive oxygen species (ROS) can assess the occurrence of iron death<sup>[7]</sup>.

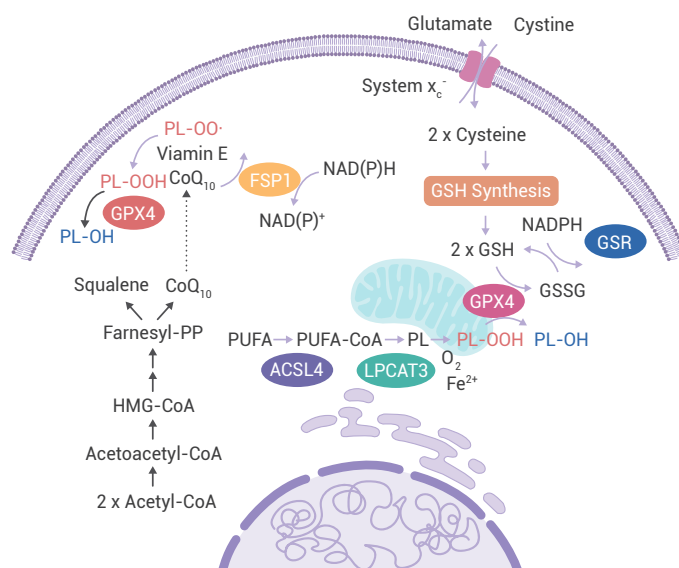


Figure 4. The Ferroptosis Signaling Pathway<sup>[8]</sup>.

Detection	Cat. No.	Product Name	Description
Cell Viability Assay	HY-K1077	Annexin V-mCherry /SYTOX Green Kit	Evaluation of ferroptosis outcomes via cell viability assay.
	HY-U00451	ATP-Red 1	
	HY-D1020	7-AAD	
Iron Ion Assay	HY-137805	Ferrozine	Aggregation of divalent iron ions happens during ferroptosis. Detecting the iron ion situation can determine whether ferroptosis initiates.
	HY-D1533	RhoNox-1	
	HY-D1913	FerroOrange	
Lipid Peroxidation Assay	HY-D1301	C11 BODIPY 581/591	Increasing level of intracellular lipid ROS occurs during ferroptosis. Determining the presence of ROS through a dedicated assay helps to determine whether ferroptosis initiates.
	HY-D1412	Liperfluor	
	HY-D0079	Dihydroethidium	

## 03 Cuproptosis

Cuproptosis is characterized by excessive accumulation of copper ions, resulting in abnormal accumulation of thioctylated proteins. This interferes with iron-sulfur cluster proteins linked to mitochondrial respiration, inducing a proteotoxic stress response and ultimately culminating in cell death. Copper is implicated in various signaling pathways in tumor cells. Detecting intracellular **copper ion concentration** and **cellular activity** serves as a means to determine the occurrence of cuproptosis<sup>[9]</sup>.

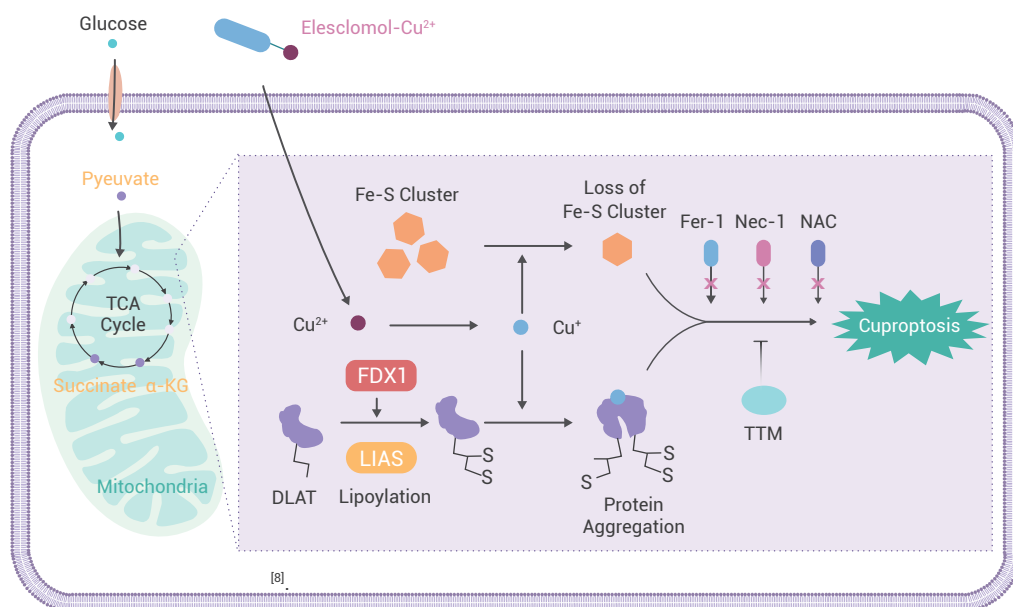


Figure 5. Molecular Mechanisms of Cuproptosis<sup>[10]</sup>.

Cat. No.	Product Name	Ex (nm)	Em (nm)	Description
HY-141511	Coppersensor 1	543	576	Copper ion detection probes can undergo a ligand reaction with copper ions and cause a change in fluorescence intensity. By observing the change in the intensity of the fluorescence signal, the presence and amount of copper ions can be indirectly inferred.
HY-126823	Phen Green SK Diacetate	507	532	
HY-123645	Rhodamine B Hydrazide	565	585	
HY-D0309	Rhodamine 6G	565	585	
HY-101894	Dihydrorhodamine 123	488	525	Excessive copper ions can stimulate the production of oxygen free radicals in mitochondria, thereby exacerbating oxidative stress and ultimately leading to copper-induced cell death. ROS detection can be used to assess copper death.
HY-118540	Resazurin	530	590	
HY-W040143	2',7'-Dichlorofluorescein	496	525	
HY-D1055	MitoSOX Red	396	610	



## 04 ROS Assays

Reactive oxygen species (ROS), byproducts of aerobic metabolism in living organisms, are a collective term for oxygen-containing and highly reactive substances. ROS play important roles in oxidative stress, cell division and differentiation, immune activation, and aging within cells. MCE has introduced a novel ROS probe, the world's first, which can precisely target specific ROS for qualitative and quantitative analysis. This new type of ROS probe, characterized by outstanding selectivity and sensitivity, can qualitatively and quantitatively detect  $O_2^{\cdot-}$ ,  $H_2O_2$ ,  $HOCl$ ,  $\cdot OH$ , and  $ONOO^-$ [11].

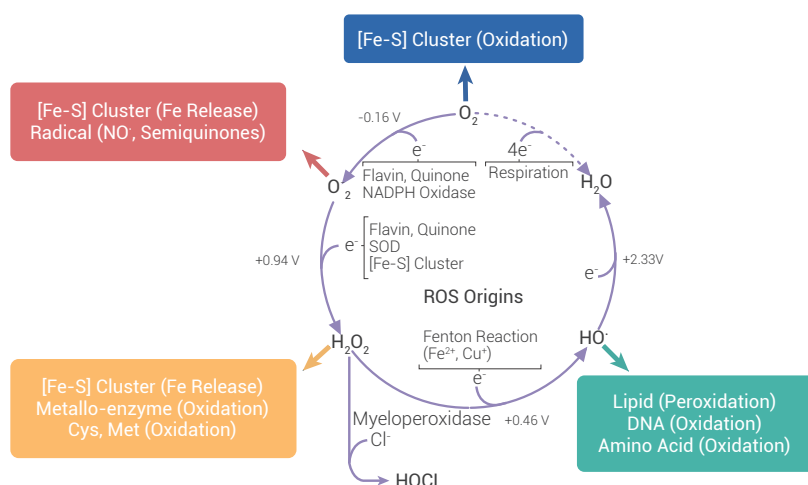


Figure 6. ROS Sources and Biochemical Properties<sup>[12]</sup>.

Cat. No.	Product Name	Ex (nm)	Em (nm)	Function	Color
HY-130013	HKYellow-AM	543	567	ONOO <sup>-</sup> Probe	Yellow
HY-130015	HKSOX-1	509	534	$O_2^{\cdot-}$ Probe	Green
HY-130017	HKSOX-1r	509	534	$O_2^{\cdot-}$ Probe	Green
HY-130022	HKPerox-1	520	543	$H_2O_2$ Probe	Green
HY-130025	HKOCI-3	490	527	HOCl Probe	Green
HY-D1148	HKGreen-4I	520	543	ONOO <sup>-</sup> Probe	Green
HY-D1151	HKOH-1	500	520	$\cdot OH$ Probe	Green
HY-D1156A	HKSOX-1m	509	534	$O_2^{\cdot-}$ Probe	Green
HY-D0034	ABMDMA	380	407	$^1O_2$ Probe	Blue

## 05 Cellular Ion Assays

Cellular ions, chemical elements existing as chemical elements within cells, hold significance in cellular physiological processes. Regulated and balanced by ion channels and transport proteins, they are pertinent to various biological studies, including tumor, inflammation, and cell death research<sup>[13]</sup>.

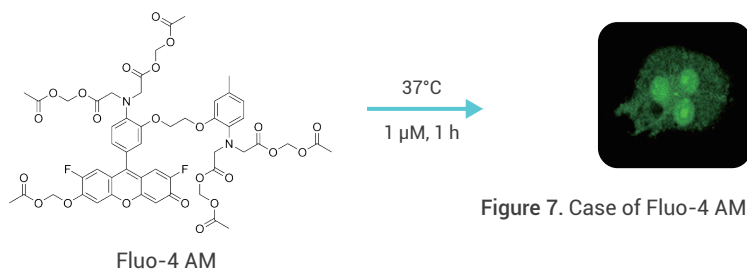


Figure 7. Case of Fluo-4 AM Staining<sup>[14]</sup>.

Cat. No.	Product Name	Ex (nm)	Em (nm)	Function	Color
HY-137805	Ferrozine	562	572	Fe <sup>2+</sup>	Red
HY-D1533	RhoNox-1	540	575	Fe <sup>2+</sup>	Red
HY-141511	Coppersensor 1	543	576	Cu <sup>+</sup>	Red
HY-D1601	N-Aminofluorescein	495	516	Cu <sup>2+</sup>	Green
HY-D1435	Oxonol VI	620	750	K <sup>+</sup>	Red
HY-D1436	PBFI	340/380	500	K <sup>+</sup>	Green
HY-101897	Fura-2 AM	336	505	Ca <sup>2+</sup>	Green
HY-D0716	Fluo-3 AM	488	526	Ca <sup>2+</sup>	Green
HY-D0982	Zinquin	368	490	Zn <sup>2+</sup>	Green
HY-D0159	ZnAF-1F	489	514	Zn <sup>2+</sup>	Green
HY-128536	KMG-104 AM	495	514	Mg <sup>2+</sup>	Green
HY-D1498	Mag-Fluo-4 AM	475	515	Mg <sup>2+</sup>	Green
HY-126831	SBFI-AM	380	500	Na <sup>+</sup>	Green
HY-D1760	SBFI	380	500	Na <sup>+</sup>	Green
HY-D0090	MQAE	355	460	Cl <sup>-</sup>	Blue
HY-D0936	SPQ	344	443	Cl <sup>-</sup>	Blue

# IN VIVO IMAGINGIN

*In Vivo* imaging technology refers to the application of imaging methods to qualitatively and quantitatively study tissues, cells, and molecular processes in living organisms. *In vivo* imaging mainly consists of two techniques: bioluminescence imaging and fluorescence imaging.

## 01 Bioluminescence Imaging

Bioluminescence imaging involves transfecting cells or DNA with the luciferase gene, which then produces a protein enzyme that undergoes biochemical reactions with corresponding substrates, generating probe light signals inside the organism. This reaction is a chemical process characterized by high sensitivity, non-radioactivity, high specificity, and lack of autofluorescence. The labeling depth can reach 3-4 cm<sup>[15]</sup>.

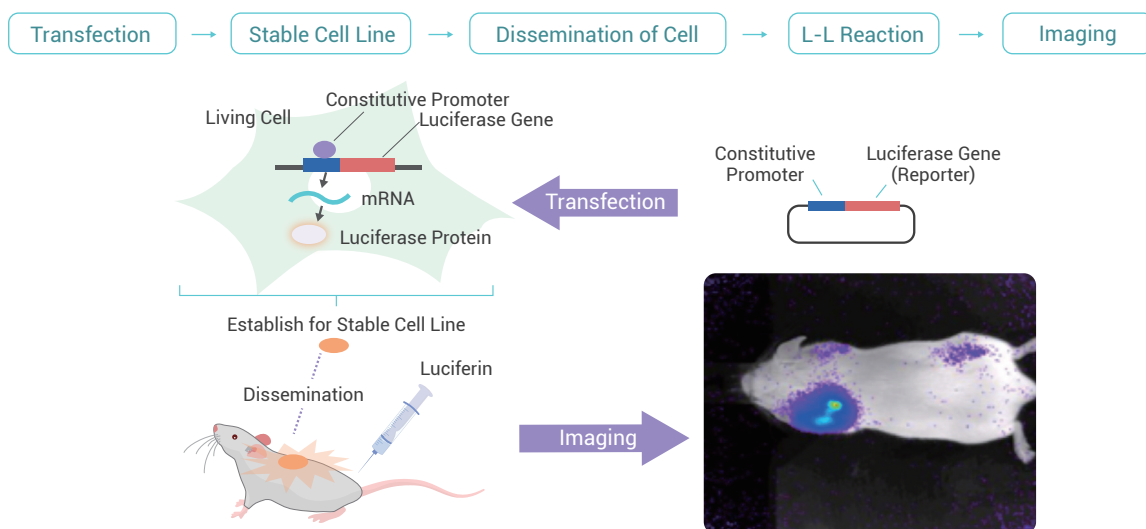


Figure 8. Mechanism and Process of Luciferase Bioluminescence Imaging<sup>[15]</sup>.

Cat. No.	Product Name	Luciferase Substrate
HY-12591A	D-Luciferin	Luciferin
HY-12591B	D-Luciferin (Potassium)	
HY-111653	CycLuc1	
HY-12591	D-Luciferin (Sodium)	



Cat. No.	Product Name	Luciferase Substrate
HY-18743	Coelenterazine	Renilla
HY-D1024	Coelenterazine h	

## 02 Fluorescence Imaging

Fluorescence imaging primarily utilizes fluorescent reporter genes (such as GFP, RFP) or fluorescent dyes like Cy and IR for labeling. The fluorescence formed by fluorescent proteins and dyes in the body can be used to assess the distribution of tumors and drugs. Compared to bioluminescence imaging, fluorescence imaging features fast imaging speed, easy operation, low experimental cost, and ease of integration with *in vivo* and *in vitro* experiments<sup>[16]</sup>.

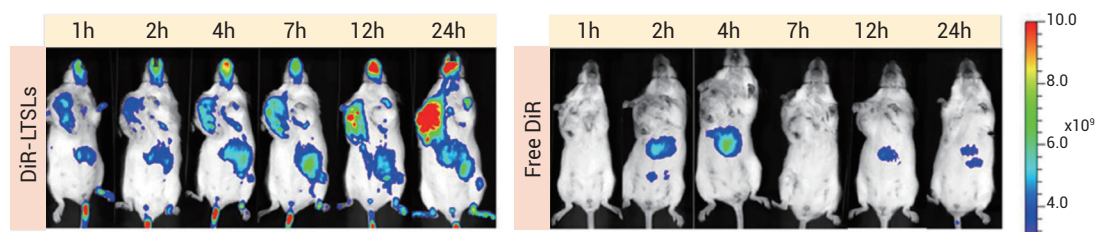
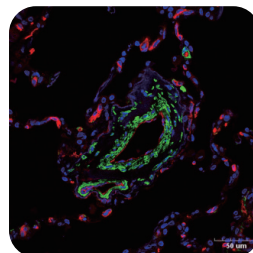


Figure 9. *In vivo* Antitumor Efficacy in 4T1 Tumor-Bearing Balb/C Mice<sup>[16]</sup>.

Cat. No.	Product Name	Ex (nm)	Em (nm)	Color
HY-D1048	DIR	748	780	Red
HY-D1041	ICG-OSu	789	814	Red
HY-D1535	IR 813 Perchlorate	815	840	Red
HY-D1724	IR-806	806	833	Red
HY-136886	IR-820	820	845	Red
HY-133852A	FD-1080 Free Acid	1064	1080	Red
HY-D1028	DID	633	665	Red
HY-15938	5-FAM SE	488	515	Green

# FLUORESCENT LABELING

Fluorescent labeling refers to the covalent binding or physical adsorption of fluorescent substances onto a specific group of molecules under study. By utilizing the fluorescence properties, it enables qualitative, positional, and quantitative analysis of the labeled objects. Fluorescent labeling has penetrated into multiple fields such as pharmacology, physiology, environmental science, information science, etc., and it also finds widespread applications in areas like protein function research and drug screening.



**Application:** Protein / Antibody / Polypeptide / Saccharide / Small Molecules

Cat. No.	Product Name	Ex (nm)	Em (nm)	Similar Dyes
HY-15937	5(6)-FAM SE	488	515	FITC/AF488
HY-112498	Cy3 NHS Ester	550	570	PE/TRITC/AF555/OPAL570
HY-D0819A	CY5-SE (Triethylamine Salt)	645	670	AF647/OPAL620
HY-D0925A	CY 5.5-SE	680	710	VF680
HY-D0824	CY7-SE	740	770	VF750
HY-D1567	Cy7.5 NHS ester	788	808	Cy7.5
HY-D1798	Vari Fluor 350 SE	350	448	AF350
HY-D1794	Vari Fluor 405 SE	399	421	DAPI
HY-D1801	Vari Fluor 488 SE	488	513	FITC/AF488
HY-D1795	Vari Fluor 532 SE	532	545	AF514/Opal540
HY-D1792	Vari Fluor 555 SE	550	561	PE/TRITC/AF555/OPAL570
HY-D1796	Vari Fluor 594 SE	585	609	AF594
HY-D1790	Vari Fluor 640 SE	648	664	OPAL 650
HY-D1797	Vari Fluor 660 SE	660	679	CY5/AF647/OPAL620
HY-D1800	Vari Fluor 680 SE	680	700	CY5.5/OPAL690
HY-D1791	Vari Fluor 750 SE	747	770	CY7

# Fluorescent Labeling Services

MCE has an experienced and highly efficient technical team capable of labeling and conjugating small molecule compounds, proteins, antibodies, and peptides. We offer a variety of label and conjugate options and provide customized services starting from microgram levels. MCE is committed to providing personalized solutions to meet your diverse needs.

## Our Advantage

- 1 Professional protein/organic chemistry technical team.
- 2 Provide professional pre-sales and after-sales technical services.
- 3 Provide high-standard labeled coupling customization services from  $\mu\text{g}$  to mg levels.
- 4 Minimize steric hindrance and reduce the decrease in activity of the labeled substance to the maximum extent.

## Our Services



## References:

- |  |   |   |
|--|---|---|
| [1] Curr Opin Cell Biol. 2018 Aug;53:84-91.              | [2] Methods Mol Biol. 2011;740:1-6.         | [3] Pharmacol Ther. 2001 Oct;92(1):57-70.             |
| [4] World Acad Sci J 2: 39-48, 2020.                     | [5] Toxicol Pathol. 2007 Jun;35(4):495-516. | [6] Cell Prolif. 2020 Nov;53(11):e12915.              |
| [7] Cell Death Dis. 2020 Feb 3;11(2):88.                 | [8] Trends Mol Med. 2021 Feb;27(2):113-122. | [9] Cell Res. 2022 May;32(5):417-418.                 |
| [10] Signal Transduct Target Ther. 2022 Nov 23;7(1):378. | [11] Physiol Rev. 2014 Jul;94(3):909-50.    | [12] Antioxid Redox Signal. 2012 Apr 15;16(8):763-71. |
| [13] Drug Discov Today. 2001 Dec 15;6(24):1278-1287.     | [14] iScience. 2021 Oct 12;24(11):103261.   | [15] Proc Am Thorac Soc. 2005;2(6):537-40, 511-2.     |
| [16] Curr Opin Biotechnol. 2007 Feb;18(1):17-25.         |   |   |

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