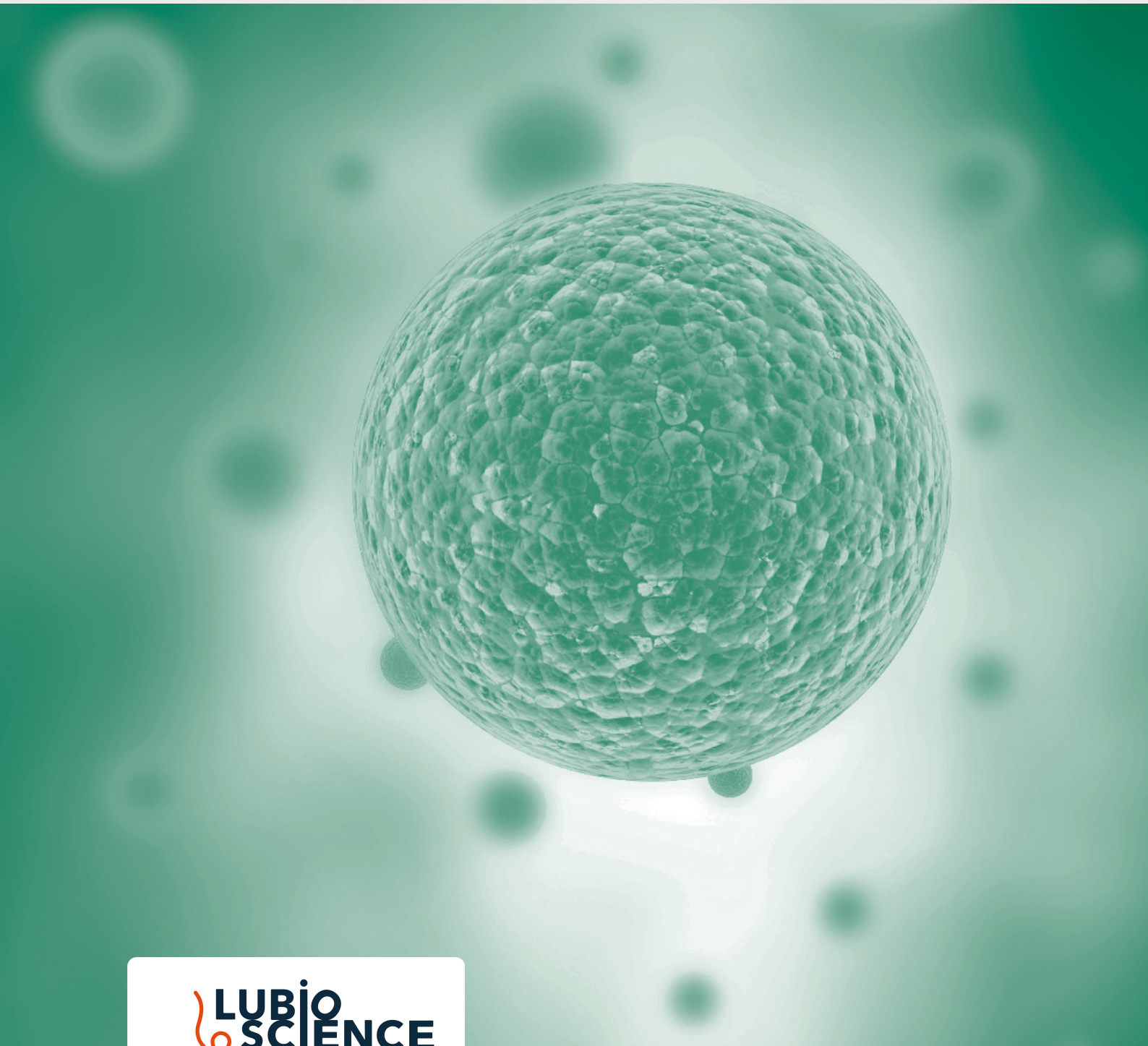
Live Cell Analysis

Visualize Cellular Responses with CELLESTIAL® Fluorescent Probes



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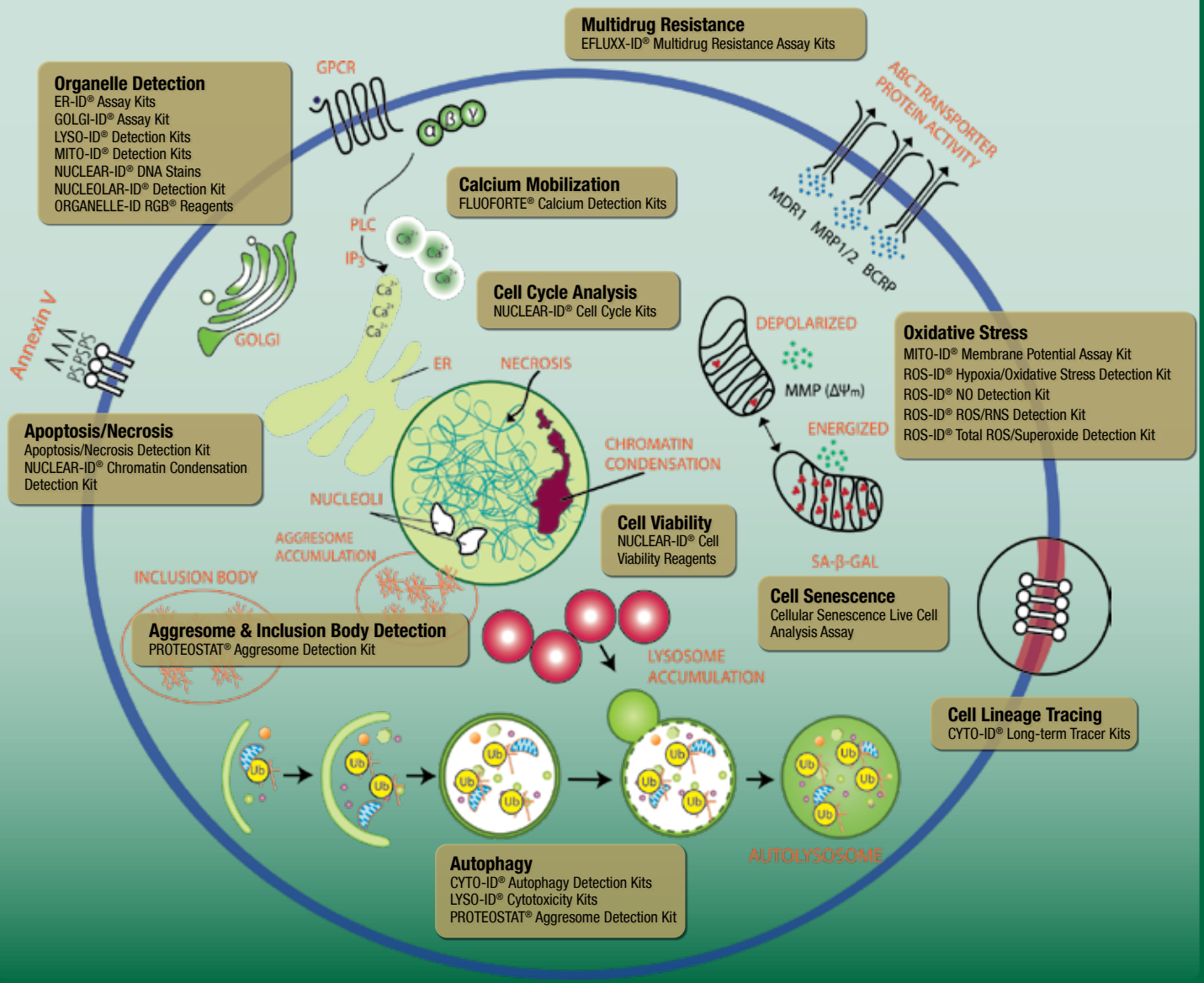
NOVEL FLUORESCENT PROBES & REPORTER ASSAYS

High-specificity, next-generation fluorescent dyes for visualizing cellular responses

The use of fluorescent dyes to identify cell structural components and monitor cytotoxicity or cellular responses to growth signals is well established. In addition to a wide selection of gold standard labeling dyes such as DAPI, Hoechst, and JC-1, Enzo Life Sciences has translated its expertise in fluorescent probe chemistry and cellular analysis into our CELLESTIAL® portfolio of unique probe-based assays and reagents to meet the emerging needs of the life sciences and drug discovery markets. From simple organelle-specific dyes for imaging cell structure and determining cell viability, to more complex dyes and reporter assays for monitoring cell signaling, death pathways, and toxicity, every product is developed and reliably manufactured to provide sensitivity, specificity, and convenience.



CONVENIENT
Increased photostability reduces photobleaching

SPECIFIC
Reduce false positives by eliminating non-specific dye-associated artifacts

FLEXIBLE
Compatible with common dyes and fluorescent markers (i.e., GFP) for multiplex analysis

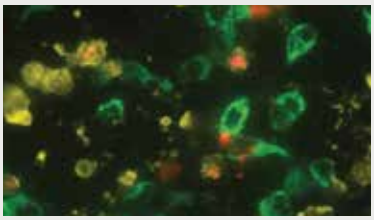
CONSISTENT
Optimized for reproducibility on microplate, flow cytometry, or fluorescent imaging platforms

CELL DEATH/AUTOPHAGY

Discover our portfolio of dyes for monitoring programmed cell death pathways, cell viability, and cell cycle analysis to streamline your workflow.

APOPTOSIS/NECROSIS DETECTION KIT (GFP-CERTIFIED®) – ENZ-51002

GFP-compatible multiplex assay for distinguishing between healthy, early apoptotic, late apoptotic and necrotic cells



Detect cell death in GFP expressing cell lines

- True multiplexing capabilities with GFP and other fluorescent probes (BFPs, CFPs)
- Optimized for both fluorescence microscopy and flow cytometry applications
- Suitable for death pathway analysis and drug/toxin studies

How it Works

The red nuclear dye acts as a marker of necrosis (loss of membrane integrity), while gold-labeled Annexin V detects apoptosis. The green channel remains free for GFP, FITC, etc.

CYTO-ID® AUTOPHAGY DETECTION KIT – ENZ-51031

A no-transfection quantitative assay for monitoring autophagy in live cells

Quantify autophagic vesicles with minimal background

- No transfection required
- Proprietary dye stains autophagic vesicles with minimal lysosomal background
- Protocol validated with known inhibitors and activators of autophagic activity

How it Works

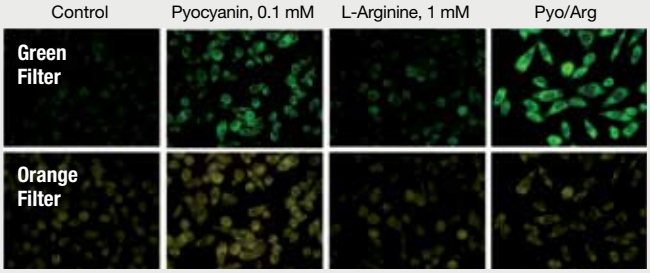
Autophagic vesicles appear as punctate green dots, with minimal background staining of lysosomes.

OXIDATIVE STRESS

Dyes for oxidative stress include probes to monitor accumulation of reactive oxygen species and compromised mitochondrial function, both of which are implicated in the pathology of aging, cancer, diabetes, and neurodegeneration.

ROS-ID® TOTAL ROS/SUPEROXIDE DETECTION KIT – ENZ-51010

Directly monitor global levels of reactive oxygen species (ROS), and specifically superoxide



Flexible assay for profiling general ROS/RNS formation

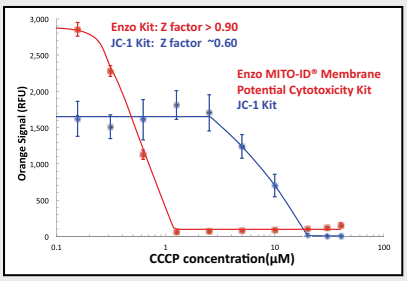
- High sensitivity, specificity and accuracy for live cell studies
- Simultaneously detects ROS and superoxide
- Red nitric oxide (NO) detection dye also available

How it Works

The general ROS dye fluoresces green in the presence of ROS, while the SO-specific dye fluoresces yellow. Profiling of H_2O_2, $ONOO^-$, and •OH is enabled by treatment with specific inhibitors (included).

MITO-ID® MEMBRANE POTENTIAL CYTOTOXICITY KIT – ENZ-51019

A real-time mitochondrial membrane potential assay with superior sensitivity



High-throughput analysis of mitotoxicity

- 10X more sensitive than JC-1 with superior aqueous solubility
- Photostable dual-emission dye
- No-wash/No-medium removal
- Separate MITO-ID Red/Green assays are available for detection of mitochondrial mass
- Suitable for high-throughput applications

How it Works

The dual-emission dye fluoresces green (monomers) and orange (aggregates) in energized mitochondria. Loss of orange signal is indicative of decreased MMP.

CALCIUM MOBILIZATION

FLUOFORTE® dyes are optimized for high-throughput detection of intracellular calcium, a well characterized second messenger commonly used to monitor GPCR activation in primary screening.

FLUOFORTE® CALCIUM ASSAY KITS – ENZ-51016 / 51017

A mix-and-read, no-wash calcium mobilization assay

Optimized permeability and brighter signal

- Dye optimized for superior cell-permeability and retention
- Economical alternative developed for use with conventional dual-dispensing microplate readers
- Provides EC_{50} values comparable to Fluo-4 and Calcium 4
- Optional red dye enables multiplexing with green fluorophores

CELLESTIAL® FLUORESCENT PROBES

Category	Product #	Product	Application			Cell Type			Dye Excitation/Emission (nm)
			FC	MC	MP	L	F	P	
Calcium Mobilization	ENZ-51017 ENZ-51016	FLUOFORTE® Calcium Assay Kits[1]	●	●	●	●			490/514 ●
	ENZ-51020	FLUOFORTE® Calcium Assay Kits (GFP-CERTIFIED®)[2]	●	●	●	●			530/570 ●
Cell Cycle Analysis	ENZ-51014	NUCLEAR-ID® Green Cell Cycle Kit	●			●	●	●	503/531 ●
	ENZ-51008	NUCLEAR-ID® Red Cell Cycle (GFP-CERTIFIED®)	●			●	●	●	568/637 ●
Cell Death/Autophagy	ENZ-51002	Apoptosis/Necrosis Detection Kit (GFP-CERTIFIED®)	●	●		●			Annexin V-EnzoGold 550/570 ● Red necrosis stain 546/647 ●
	ENZ-51021	NUCLEAR-ID® Green Chromatin Condensation Kit	●	●		●		●	503/531 ●
	ENZ-51031	CYTO-ID® Autophagy Detection Kit	●	●	●	●			463/538 ●
	ENZ-KIT175	CYTO-ID® Autophagy Detection Kit 2.0	●	●	●	●			463/538 ●
	ENZ-51035	PROTEOSTAT® Aggresome Detection Kit	●	●			●	●	500/600 ●
Cell Lineage Tracing	ENZ-51037	CYTO-ID® Red Long-term Cell Tracer Kit	●	●		●			450, 570/583 ●
	ENZ-51036	CYTO-ID® Green Long-term Cell Tracer Kit	●	●		●			359, 460/527 ●
Cell Senescence	ENZ-KIT130	Cellular Senescence Live Cell Analysis Assay	●			●			485/520 ●
Cell Viability	ENZ-53004	NUCLEAR-ID® Blue/Green Cell Viability Reagent	●	●		●			Live - Blue 350/461 ● Dead - Green 503/524 ●
	ENZ-53005	NUCLEAR-ID® Blue/Red Cell Viability Reagent (GFP-CERTIFIED®)	●	●		●			Live - Blue 350/461 ● Dead - Red 571, 619/639 ●
	ENZ-53006	NUCLEAR-ID® Red/Green Cell Viability Reagent	●	●		●			Live- Red 568/632 ● Dead - Green 503/524 ●
Multi-Drug Resistance	ENZ-51029	EFLUXX-ID® Green Multi-Drug Resistance Assay Kit	●	●		●			490/514 ●
	ENZ-51030	EFLUXX-ID® Gold Multi-Drug Resistance Assay Kit	●	●		●			530/570 ●
Oxidative Stress	ENZ-51042	ROS-ID® Hypoxia/Oxidative Stress Detection Kit	●	●		●			Oxidative Stress 504/524 ● Hypoxia 580/595 ●
	ENZ-51018	MITO-ID® Membrane Potential Detection Kit	●	●		●			525/525 ●, 590 ●
	ENZ-51019	MITO-ID® Membrane Potential Cytotoxicity Kit			●	●			525/525 ●, 590 ●
	ENZ-51001	ROS-ID® ROS/RNS Detection Kit		●		●			Oxidative Stress 504/524 ● Superoxide 530/590 ● NO 648/666 ●
	ENZ-51010	ROS-ID® Total ROS/Superoxide Detection Kit	●	●	●	●			Oxidative Stress 504/524 ● Superoxide 530/590 ●
	ENZ-51011	ROS-ID® Total ROS Detection Kit	●	●	●	●			504/524 ●
	ENZ-51012	ROS-ID® Superoxide Detection Kit	●	●	●	●			530/590 ●
	ENZ-51013	ROS-ID® NO Detection Kit		●		●			648/666 ●

[1]FLUOFORTE® Reagent available separately as: ENZ-52014 (5 x 50 µg) and ENZ-52015 (1 mg)
[2]GFP-CERTIFIED® FLUOFORTE® Reagent available separately as: ENZ-52016-5C50 (5 x 50 µg) and ENZ-52016-M001 (1 mg)
FC - Flow Cytometry **MP** - Microplate **MC** - Microscopy **L** - Live **F** - Fixed **P** - Permeabilized

Microscopy Flow Cytometry Microplate

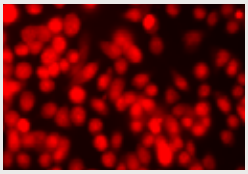
www.enzolifesciences.com/cellestial

ORGANELLE DETECTION

Multi-color organelle-specific dyes for co-localization studies and monitoring structural changes in response to chemical or environmental stress.

NUCLEAR-ID® RED DNA STAIN – ENZ-52406

A brighter, cell permeable DNA stain



Bright nuclear staining requires low concentration of dye

- Brighter stain results in lowered concentration and cytotoxicity
- No photobleaching effect
- No RNase treatment is required
- Far-red fluorescent specific DNA dye does not require UV laser source

How it Works
This far-red fluorescent dye is cell-permeable and rapidly stains DNA in live, fixed, or permeable cells.

LYSO-ID® RED CYTOTOXICITY KIT – ENZ-51015

A rapid, quantitative and HTS-compatible live cell cytotoxicity assay

Monitor abnormal lysosome accumulation arising from drug-induced phospholipidosis

- LYSO-ID dye rapidly partitions into cells and labels acidic organelles
- Only commercial assay available that allows for long-term cell monitoring of cytotoxic effects
- Multi-well, HTS-compatible assay with rapid 10-15 minute dye incubation

How it Works
This cationic amphiphilic tracer (CAT) dye rapidly partitions into cells and fluoresces red in lysosomes and weakly acidic lysosome-like vacuoles.

CELLESTIAL® FLUORESCENT PROBES

Category	Product #	Product	Application			Cell Type			Dye Excitation/Emission (nm)
			FC	MC	MP	L	F	P	
Organelle Detection	ENZ-51025	ER-ID® Green Assay Kit		●		●	●	●	441/551 ●
	ENZ-51026	ER-ID® Red Assay Kit (GFP-CERTIFIED®)		●		●	●	●	580/677 ●
	ENZ-51028	GOLGI-ID® Green Assay Kit		●		●	●		473/534 ●
	ENZ-51034	LYSO-ID® Green Detection Kit		●		●			LYSO-ID® Green 481/544 ● Hoechst 33342 (nuclear) 350/461 ●
	ENZ-51005	LYSO-ID® Red Detection Kit (GFP-CERTIFIED®)		●		●			LYSO-ID® Red 568/667 ● Hoechst 33342 (nuclear) 350/461 ●
	ENZ-51015	LYSO-ID® Red Cytotoxicity Kit (GFP-CERTIFIED®)		●	●	●			568/667 ●
	ENZ-51007	MITO-ID® Red Detection Kit (GFP-CERTIFIED®)		●		●	●	●	MITO-ID® Red 558/690 ● Hoechst 33342 (nuclear) 350/461 ●
	ENZ-51022	MITO-ID® Green Detection Kit		●		●	●	●	MITO-ID® Green 460/560 ● Hoechst 33342 (nuclear) 350/461 ●
	ENZ-CHM103	NUCLEAR-ID® Blue DNA Stain (GFP-CERTIFIED®)		●		●	●	●	350/461 ●
	ENZ-52406	NUCLEAR-ID® Red DNA Stain	●	●		●	●	●	568/637 ●
	ENZ-51009	NUCLEOLAR-ID® Green Detection Kit		●		●			450/481 ●
	ENZ-51006	Total NUCLEAR-ID® Green/Red Nucleolar/Nuclear Detection Kit		●		●			NUCLEOLAR-ID® Green 450/481 ● NUCLEAR-ID® Red 568/631 ●
	ENZ-53007	ORGANELLE-ID RGB® Reagent I		●		●			Lysosome 568/667 ● Mitochondria 460/560 ● Nucleus 350/461 ●
	ENZ-53008	ORGANELLE-ID RGB® Reagent II		●		●			Lysosome 568/667 ● ER 440/565 ● Nucleus 350/461 ●
	ENZ-51032	ORGANELLE-ID RGB® III Assay Kit		●		●			ER 580/677 ● Golgi 473/543 ● Nucleus 357/449 ●
	ENZ-53009	ORGANELLE-ID RGB® Reagent IV		●		●			ER 580/677 ● Lysosome 481/544 ● Nucleus 350/461 ●

GOLD STANDARD DYES

COMMON FLUORESCENT PROBES FOR CELLULAR ANALYSIS			
Dyes	**Product #**	**CELLESTIAL® Product**	**Ex/Em**
Amine-Reactive	ENZ-52051	5-Carboxyfluorescein (Ultra Pure)	492/581nm
	ENZ-52451	5-FITC (Ultra Pure)	494/520nm
	ENZ-52452	5(6)-TRITC (Ultra Pure)	543/571nm
	ENZ-42541	Cyanine 3-NHS Ester Pack	553/570nm
	ENZ-42542	Cyanine 5-NHS Ester Pack	650/664nm
Amyloid Detection	ENZ-52552	Congo Red (Ultra Pure)	497/614nm
Calcium Indicators	ENZ-52002	Calcein AM (Ultra Pure)	495/515nm
	ENZ-52004	Fluo-3 AM (Ultra Pure)	506/526nm
	ENZ-52054	Coelenterazine (Ultra Pure)	429/466nm
	ENZ-52006	FURA-2 AM (Ultra Pure)	370/476nm
	ENZ-52007	FURA-2 (Ultra Pure)	363/512nm
	ENZ-52008	INDO-1 AM (Ultra Pure)	346/475nm
	ENZ-52010	Rhod-2 AM (Ultra Pure)	549/578nm
Chloride Indicators	ENZ-52154	Lucigenin (Ultra Pure)	455/505nm
	ENZ-52156	MQAE (Ultra Pure)	350/460nm
Lipid Detection	ENZ-52551	Nile Red (Ultra Pure)	552/636nm
Membrane Potential Detectors	ENZ-52201	Di-2-ANEPEQ	517/721nm
	ENZ-52204	Di-8-ANEPPS	498/713nm
	ENZ-52205	DiBAC4(3) (Ultra Pure)	493/516nm
	ENZ-52207	DiI1(5) iodide (Ultra Pure)	638/658nm
Mitochondrial Detection	ENZ-52302	Dihydrorhodamine 123 (Ultra Pure)	507/529nm
	ENZ-52303	DiOC6(3) iodide (Ultra Pure)	482/504nm
	ENZ-52304	JC-1 (Ultra Pure)	515/529nm
	ENZ-52305	JC-10 (Ultra Pure)	515/529nm
	ENZ-52306	NAO [Nonyl Acridine Orange] (Ultra Pure)	495/519nm
	ENZ-52307	Rhodamine 123 (Ultra Pure)	507/529nm
	ENZ-52309	TMRE (Ultra Pure)	549/574nm
Neuronal Detection	ENZ-52253	Hydroxystilbamidine (Ultra Pure) (FLUORO-GOLD™ alternative)	385/536nm
	ENZ-52251	MM 1-43 (FM® 1-43 alternative)	510/626nm
	ENZ-52252	MM 1-64 (FM® 4-64 alternative)	558/734nm
Nuclear Detection	ENZ-52405	Acridine Orange (Ultra Pure)	500/525nm
	ENZ-52404	DAPI (Ultra Pure)	358/461nm
	ENZ-52402	Hoechst 33258 (Ultra Pure)	352/461nm
	ENZ-52401	Hoechst 33342 (Ultra Pure)	350/461nm
	ENZ-52403	Propidium Iodide (Ultra Pure)	535/617nm
pH Indicator	ENZ-52102	BCECF AM (Ultra Pure)	505/520nm
Reactive Oxygen Detection	ENZ-52103	5(6)-CFCFDA (Ultra Pure)	494/521nm
	ENZ-52104	5(6)-CFDA (Ultra Pure)	494/521nm
	ENZ-52354	Luminol (Ultra Pure)	355/411nm
	ENZ-51004	Red Hydrogen Peroxide Assay Kit	570/585nm
Thiol-Reactive	ENZ-52502	Fluorescein-5-maleimide (Ultra Pure)	493/515nm
	ENZ-52501	Monobromobimane [mBBR] (Ultra Pure)	395/490nm
Zinc Ion Indicators	ENZ-52153	TSQ (Ultra Pure)	344/385nm
	ENZ-52151	Zinquin ethyl ester (Ultra Pure)	368/490nm
	ENZ-52152	Zinquin free acid (Ultra Pure)	368/490nm