chemodex
customized molecules

Need new markers, probes, stains, labels?
Looking for an inexpensive, global sources
of common fluorescent markers?

Chemodex will strive to meet your unique needs.

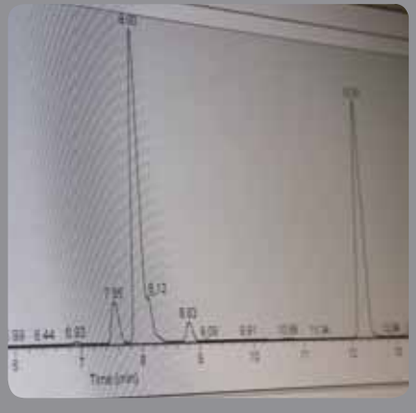










chemodex
customized molecules

Fluorescent probes, stains and labels have played a key role for the impressive progress made in life sciences. Superior sensitivity and selectivity are the main advantages that fluorescence techniques offer over alternative methods. Therefore, fluorescence techniques have become popular tools in application areas such as analytical biochemistry, immunoassays and microscopy.

Fluorescent probes are a perfect example for Chemodex's ability to provide complex speciality chemicals. Our core business is the synthesis of fluorescent substances derived from fluorophores such as coumarin, fluorescein, rhodamine, and pyrene. This brochure provides an overview of selected product groups, our most popular fluorescent probes and gives an overview of inexpensive, global source of common fluorescent compounds. Our portfolio includes several hundred products, whereasour product portfolio is not limited to these compounds.

In fact we provide a wide range of products including:

- New chemicals not yet published in literature.
- Published compounds known from literature.
- Established and commercially available chemicals.

These products include metabolites, general building blocks and many others. Please contact us or check our homepage to explore the whole portfolio.

The chemicals are provided from stock in Switzerland, manufactured by custom synthesis according to customer needs and specification or sourced for you from our world-wide producers.

We appreciate your inquiry for products not included in our portfolio, even if you need substances which are not commercially available yet. We are in particular looking forward to your inquiry for custom synthesis. Our chemists are experienced in development of new synthetic routes and have been able to procure synthesis, which seemed to be too challenging before.

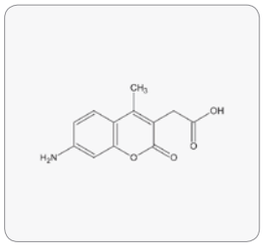
We handle the customers' demands with reliable quality and within a minimum of time. Our flexible and efficient organisation enables us to meet your specific requirements for quality, packaging and shipment at highly competitive prices.

If you are looking for a specific substance that you can not find in this brochure, please check our website www.chemodex.com. We strive to meet your unique needs and do our best to provide these substances. Please don't hesitate to contact us.

Fluorescent Labels

A-009

7-Amino-4-methyl-3-coumarinylacetic acid
(AMCA-H)



$C_{12}H_{11}NO_4$

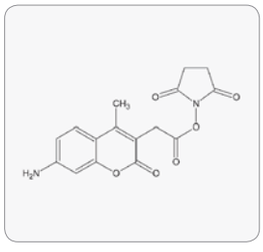
Molecular Weight	233.22
CAS No	106562-32-7
Purity: > 90% (HPLC)	
λex 350 nm; λem 443nm in MeOH	
Solubility: DMSO, DMF	

1. G-L. Ferri et al.; J. Histochem. Cytochem. 45(2), 155 (1997)
2. B. Ufhake et al.; J. Neurosc. Meth. 40(1), 39 (1991)
3. M. W. Wessendorf et al.; J. Histochem. Cytochem. 38(1), 87 (1990)

AMCA (aminomethylcoumarin acetate) is a blue fluorescent dye. Its desirable properties include a relatively large Stoke's shift and resistance to photobleaching. Reactive AMCA derivatives are used as contrasting probes for double and triple labeling in immunofluorescence microscopy, arrays and in situ hybridization.

A-010

7-Amino-4-methyl-3-coumarinacetic acid N-succinimidyl ester
(AMCA-H NHS)



$C_{16}H_{14}N_2O_6$

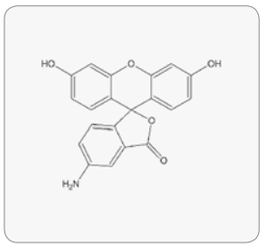
Molecular Weight	330.29
CAS No	113721-87-2
λex 354nm; λem 440 nm in MeOH	
Solubility: DMSO, DMF	

1. H.I. Stefanova et al.; Biochem. 32(1), 356 (1993)
2. M.A. Salvucci et al.; Plant Physiol. 103(2), 501 (1993)

AMCA-H NHS ester reacts with primary amines at pH 7.0-9.0. Suitable for labeling lysyl residues in proteins.

A-018

5-Aminofluorescein
(Fluoresceinamine Isomer I)



$C_{20}H_{13}NO_5$

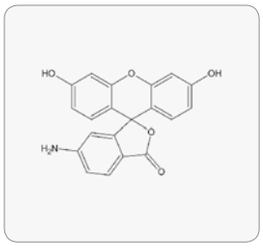
Molecular Weight	347.32
CAS No	3326-34-9
Dark red powder	
Purity: > 95% (HPLC), 6-Isomer > 1%	
λmax 496nm (Borate buffer, pH 8.5)	
Solubility: Acetone, Methanol	

1. O.N. Burchak et al.; Bioorg. & Med. Chem. 14(8), 2559 (2006)
2. H. Sigmund et al.; Helv. Chim. Acta, 86(7), 2299 (2003)
3. A. Ogamo et al.; Carboh. Res. 105(1), 69 (1982)

Glycosaminoglycuronans react with 5-aminofluorescein to yield fluorescent derivatives. 5-aminofluorescein is also used to prepare FITC Isomer I (F-011, F-020).

A-019

6-Aminofluorescein
(Fluoresceinamine Isomer II)



$C_{20}H_{13}NO_5$

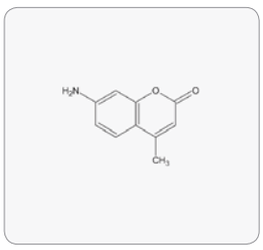
Molecular Weight	347.32
CAS No	51649-83-3
Purity: >95% (HPLC)	
λex 490 nm; λem 520 nm (0.1 M Tris pH 9.0)	
Solubility: Methanol (1 mg/ml), Acetone	
MP: >285 °C	

1. O.N. Burchak et al., Bioorg. & Med. Chem. 14(8), 2559 (2006)
2. Y.J. Pang et al.; Macromol. Sci., Part A: Pure and Appl. Chem. A42(8), 1013 (2005)
3. A. Ogamo et al.; Carboh. Res. 105(1), 69 (1982)

Glycosaminoglycuronans react with 6-aminofluorescein to yield fluorescent derivatives.

A-021

7-Amino-4-methylcoumarin
(Coumarin 120, AMC)



$C_{10}H_9NO_2$

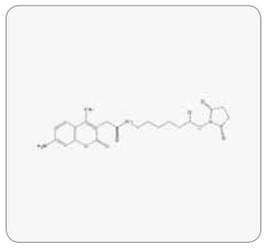
Molecular Weight	175.18
CAS No	26093-31-2
λex 351nm; λem 430 nm (Methanol)	
Solubility: DMSO, DMF, Acetone	
MP: 223-226 °C	

1. M. Yodoshi et al.; J. Chrom., 1203(2), 137 (2008)
2. K.L. Kage et al.; J. of Neuroscience Meth., 161(1), 47 (2007)
3. Y. Kanaoka et al.; Chem. Pharm. Bull. 30, 1485 (1982)
4. S. Khammungkhune et al.; Synthesis 8, 614 (1980)

Widely used fluorophore, well-known for preparing fluorogenic substrates for cystine aminopeptidase and other hydrolases. Used as reference compound in enzyme assays.

A-074

6-((7-Amino-4-methylcoumarin-3-acetyl) amino)hexanoic acid N-succinimidyl ester
(AMCA-X SE)



$C_{22}H_{25}N_3O_7$

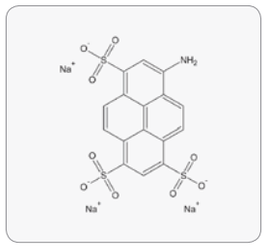
Molecular Weight	443.45
CAS No	216309-02-3
White Solid	
λex 353 nm; λem 442 nm (MeOH)	
Solubility: DMSO, DMF	

1. H.J. Jung et al.; J. Biol. Chem. 285(15), 11584 (2009)
2. F.T. Ishmael et al.; J. Biol. Chem. 276(27), 25236 (2001)
3. P. Zhang et al.; Angew. Chem. Int. Ed. Engl. 40(2), 402 (2001)

AMCA-X SE is an amine-reactive, UV-excitable, blue fluorescent dye.

A-097

8-Aminopyrene-1,3,6-trisulfonic acid, trisodium salt
(APTS)



$C_{16}H_8NNa_3O_9S_3$

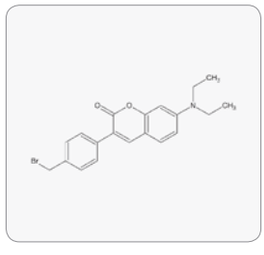
Molecular Weight	523.40
CAS No	196504-57-1
λex 488 nm; λem 520 nm	
λex 420 nm; λem 500 nm (0.1 M Tris pH 7.4, quenching with Vitamin B1)	
Solubility: Water, DMSO, DMF	

1. Z. Sharrett et al.; Org. Biomol. Chem. 7(7), 1461 (2009)
2. H. Suzuki et al.; Anal. Chem. 69, 4554 (1997)
3. R.A. Evangelista et al.; Anal. Chem. 67, 2239 (1995)

APTS is a very useful green fluorescent dye for labeling glycoproteins or sugar molecules in general.

B-018

3-[4-(Bromomethyl)phenyl]7-(diethylamino)-coumarin
(MPAC-Br)



$C_{20}H_{20}BrNO_2$

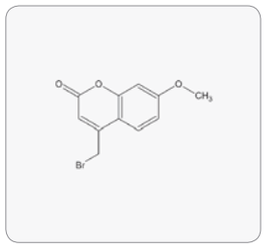
Molecular Weight	386.28
CAS No	177093-58-2
λex 402 nm; λem 476 nm (Ethanol)	
MP: 150-155 °C	

1. T. Kurasowa et al.; J. Pharm. Biomed. Anal. 15(9,10), 1375 (1997)
2. H. Takechi et al.; Chem. Pharm. Bull. 44, 793 (1996)

HPLC-precolumn-derivatization reagent for carboxylic acids. Compared to classical BMC it emits at longer wavelength and has stronger fluorescence.

B-022

4-Bromomethyl-7-methoxycoumarin
(BMC, Br-MMC)



$C_{11}H_9BrO_3$

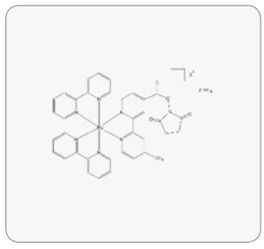
Molecular Weight	269.09
CAS No	35231-44-8
λex 322 nm; λem 395 nm (Methanol)	
Solubility: Methanol (20 mg/ml), CHCL3 (20 mg/ml)	
MP: 213-215 °C	

1. Z. Xie et al.; J. Chromatogr. Science 45(7), 405 (2007)
2. J.K. Robinson et al.; J. Chromatogr., 731(2), 179 (1999)
3. P. Leroy et al.; J. Chromatogr. 351, 267 (1986)
4. W. Dünges et al.; Anal. Chem. 49, 442 (1977)

Fluorescent label for fatty acids. For derivatization, TLC and HPLC separation, and fluorometric analysis of a wide range of naturally occurring acids, including bile and thromboxane B2.

B-032

bis-(Bipyridin)-4'-methyl-4-carboxybipy-Ru N-succinimidyl ester.PF6
(Ru(bpy)2(mcbpy-O-Su-ester)(PF6)2)



$C_{36}H_{29}F_{12}N_7O_4P_2Ru$

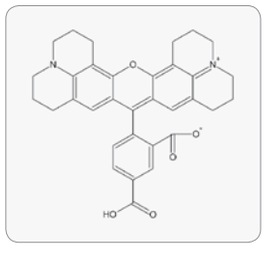
Molecular Weight	1014.66
CAS No	136724-73-7
λex 458 nm; λem 628 nm (0.1 M Phosphate pH 7.0)	
Solubility: Water	

1. C. Tokarski et al.; Electrophoresis 27(7), 1407 (2006)
2. B. Geisser et al.; Inorg. Chem. 38, 2030 (1999)
3. B.M. Peek et al.; Int. J. Pept. Protein Res. 38, 114 (1991)

Activated ester of ruthenium complex for acylation of amino acid side chain amines. This label is perfectly suitable for 1D- or 2D-protein gel staining providing a sensitivity better than SYPRO RubyTM and a similar dynamic range.

C-004

5-Carboxy-X-rhodamine
(5-ROX, 5-CXR)



$C_{39}H_{45}N_3O_5$

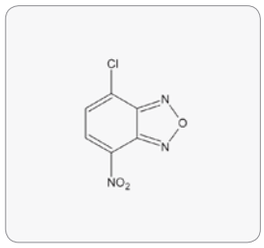
Molecular Weight	635.8
CAS No	216699-35-3
λex 575 nm; λem 600	
Solubility: Methanol, DMSO, DMF	

1. P.J. Finn et al.; Nucleic Acids Res. 30, 2877 (2002)
2. J.M. Bartlett et al.; Mol Biotechnol 13, 185 (1999)
3. S.C. Hung et al.; Anal Biochem 255, 32 (1998)

5-ROX is the purified isomer of 5(6)-ROX. It is preferred for some complicated biological applications where reproducibility is really critical. The minor positional difference between 5-ROX and 6-ROX might significantly affect some biological properties of the underlying conjugates.

C-010

4-Chloro-7-nitrobenzofurazan
(NBD-Cl)



$C_6H_2ClN_3O_3$

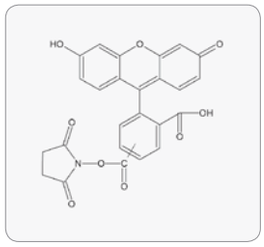
Molecular Weight	199.55
CAS No	10199-89-0
Yellow solid	
λex 420 nm; λem ~540 nm (Ethanol, after derivatization with glycine)	
Solubility: DMF	
MP: 97-99 °C	

1. Z. Kamenik et al.; Anal. Bioanal. Chem. 393(6-7), 1779 (2009)
2. M. Maroulis et al.; J. Chrom. 876(2), 245 (2008)
3. G. Ricci et al.; Anal. Biochem. 218, 463 (1994)
4. L.-G. Martensson et al.; Biochem. 32, 224 (1993)
5. A. Chattopadhyay et al.; Review. Chem. Phys. Lipids 53, 1 (1990)
6. P.B. Ghosh et al.; J. Biochem. 108, 155 (1968)

NBD chloride is nonfluorescent until it reacts with primary or secondary amines to produce a fluorescent product. NBD chloride has been extensively used as a derivatizing reagent for chromatography analysis of amino acids and low molecular weight amines.

C-011

5(6)-Carboxyfluorescein N-succinimidyl ester
(5(6)-FAM SE)



$C_{25}H_{15}NO_9$

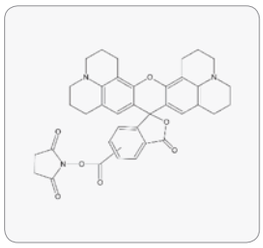
Molecular Weight	473.39
CAS No	117548-22-8
Yellow solid	
λex 492 nm; λem 517 nm (DMF)	
Solubility: DMSO, DMF	

1. A.B. Lyons et al.; J Immunol. Meth. 243(1-2), 147 (2000)
2. P.R. Banks et al.; Bioconjug. Chem. 6, 447 (1995)
3. G.P.A. Vigers et al.; J. Cell Biol. 107, 1011 (1988)
4. M. Lu-Steffes et al.; Clin. Chem. 28, 2278 (1982)

5(6)-FAM SE is an amine-reactive green fluorescent dye widely used for labeling proteins or other biomolecules that contain a primary or secondary aliphatic amine. The coupling reaction is usually carried out at pH 8-9.5. The amide linkage from the coupling reaction is much more stable than the thiourea linkage formed from the coupling of an amine and an isothiocyanate.

C-013

5(6)-Carboxy-X-rhodamin N-succinimidyl ester
((5(6)-ROX SE, 5(6)-CXR SE)



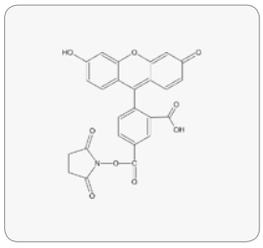
$C_{37}H_{33}N_3O_7$

Molecular Weight	631.67
CAS No	114616-32-9
Dark red solid	
λex 575 nm; λem 605nm (0.1 M Phosphate pH 7.0)	
Solubility: DMSO, DMF	
1. K. Tóthet al.; Biochemistry 40(23), 6921 (2001)	
2. C. Waterman-Storer et al.; J Cell Biol 150(2), 361 (2000)	
3. J.G. Nadeau et al.; Anal Biochem 276(2), 177 (1999)	

5-(and-6)-Carboxy-X-rhodamine, succinimidyl ester is an amine-reactive long wavelength rhodamine dye.

C-015

5-Carboxyfluorescein N-succinimidyl ester
(5-FAM SE, 5-CF SE)



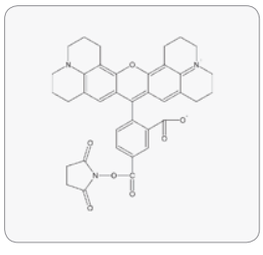
$C_{25}H_{15}NO_9$

Molecular Weight	473.39
CAS No	92557-80-7
Yellow orange solid	
λex 492 nm; λem 520 nm (0.1 M Tris pH 8.0)	
Solubility: DMSO, DMF	
1. R. Saccardi et al.; Cytotherapy 8(3), 243 (2006)	
2. L.S. Kei et al.; J. Chromatogr. A. 809, 203 (1998)	
3. G.L. Igloi; Anal. Biochem. 233, 124 (1996)	

Amine-reactive derivate of 5-carboxyfluorescein single isomer.

C-019

5-Carboxy-X-rhodamin N-succinimidyl ester
(5-ROX SE, 5-CXR SE)



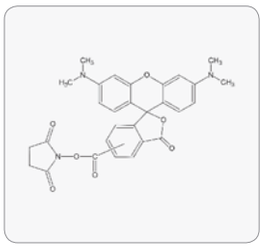
$C_{37}H_{33}N_3O_7$

Molecular Weight	631.67
CAS No	209734-74-7
λex 575 nm; λem 600 nm (0.1 M Phosphate pH 7.0)	
Solubility: DMF, Acetonitrile	
1. P.J. Finn et al.; Nucleic Acids Res. 30, 2877 (2002)	
2. L.G. Lee et al.; Anal. Biochem. 223, 39 (1994)	
3. L.G. Lee et al.; Nucleic Acids Res. 20, 2471 (1992)	

Labeling reagent for preparation of charge-modified dye-labeled ddNTPs for "direct-load" DANN sequencing.

C-027

5(6)-Carboxytetramethylrhodamine N-succinimidyl ester
(5(6)-TAMRA SE)



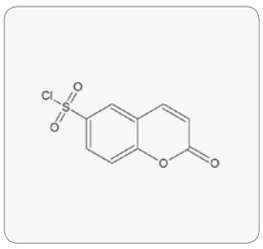
$C_{29}H_{25}N_3O_7$

Molecular Weight	527.52
CAS No	150408-83-6
Red solid	
λex 543 nm; λem 576 nm (Methanol)	
λex 554 nm; λem 584 nm (0.1 M Phosphate pH 8.0)	
Solubility: Methanol, DMF, Acetonitrile	
1. M. Cremer et al.; Meth. Mol. Biol. 463(1), 205 (2008)	
2. L.D. Mayfield et al.; Bioorg. Med. Chem. Lett. 9, 14 (1999)	
3. E. Koller; Appl. Fluoresc. Technol. 3, 20 (1991)	

Carboxytetramethylrhodamine is one of the most commonly used red fluorescent dyes. The succinimidyl ester reacts readily with primary or secondary amines under mild conditions.

C-029

Coumarin-6-sulfonyl chloride
(6-CS-Cl)



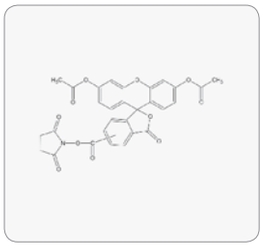
$C_9H_5ClO_4S$

Molecular Weight	244.65
CAS No	10543-42-7
λex 360 nm; λem 425 nm (Acetonitrile, after derivatization with hexylamine)	
Solubility: Acetonitrile	
MP: 119-120 °C	
1. M.Z. Salama et al.; Anal. Sciences 17, 539 (2001)	
2. S.M.Z. Al-Kindy et al.; Anal. Chim. Acta 227, 145 (1989)	
3. J.R. Merchant et al.; J. Ind. Che. Soc. 34(1) (1957)	

Coumarin-6-sulfonyl chloride is used to label amines, amino acids and phenols under mild conditions.

C-037

5(6)-Carboxyfluorescein diacetate N-succinimidyl ester
(5(6)-FAM DA SE)



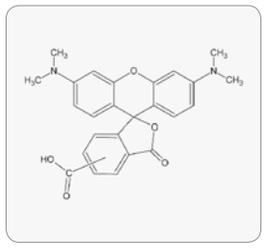
$C_{29}H_{19}NO_{11}$

Molecular Weight	557.46
CAS No	150347-59-4
λex 492 nm; λem 517 nm (0.1 M Tris pH 8.0)	
Solubility: DMSO, DMF	
MP: 152-154 °C (lit.)	
1. V.V. Ganusov et al.; J. Immun. Meth. 298(1-2), 183 (2005)	
2. C. Bergsdorf et al.; FEBS Letters 536(1-3), 120 (2003)	
3. I.E. Dumitriu et al.; Analyt. Biochem. 299, 247 (2001)	
4. A. Lyons et al.; Meth. Cell Biol. 63, 375 (2001)	

Amine-reactive succinimidyl ester can potentially be used for long-term pH studies of live cells, producing a conjugate with the pH-sensitive properties of carboxyfluorescein.

C-038

5(6)-Carboxytetramethylrhodamine
(5(6)-TAMRA)



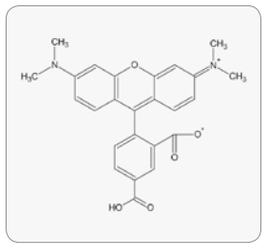
$C_{25}H_{22}N_2O_5$

Molecular Weight	430.45
CAS No	98181-63-6
Dark red solid	
λex 543 nm; λem 572nm (Methanol)	
Solubility: Methanol, DMSO, DMF, Aqueous Buffers (pH >6.5)	
MP: ≥300 °C	
1. N.A. Evans et al.; J. Neurochem. 77, 476 (2001)	
2. K.L. Hess et al.; Cytometry 27, 145 (1997)	
3. W. Lutz et al.; J. Biol. Chem. 267, 1109 (1992)	

Mixed isomers of carboxytetramethylrhodamine free acid. The dye can be coupled to primary or secondary amines via standard peptide chemistry.

C-055

5-Carboxytetramethylrhodamine
(5-TAMRA)



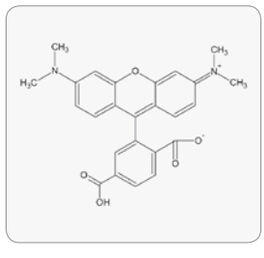
$C_{25}H_{22}N_2O_5$

Molecular Weight	430.45
CAS No	91809-66-4
Dark red solid	
λex 543 nm; λem 575 nm (0.1 M Tris pH 8.0)	
Solubility: Methanol, DMSO, DMF	
1. A. Aneja et al.; J. Biol. Phys. 34(5), 487 (2008)	
2. C. Dose et al.; Bioorg. Med. Chem. 16(1), 65 (2008)	
3. G. Vamosi et al.; Fluorescence characteristics. Biophys. J. 71, 972 (1996)	
4. L.G. Lee et al.; Nucleic Acids Res. 20, 2471 (1992)	

Free acid form of 5-carboxytetramethylrhodamine single isomer.

C-056

6-Carboxytetramethylrhodamine
(6-TAMRA)



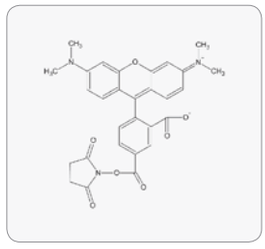
$C_{25}H_{22}N_2O_5$

Molecular Weight	430.45
CAS No	91809-67-5
Dark red solid	
λex 543 nm; λem 575 nm (0.1 M Tris pH 8.0)	
Solubility: Methanol, DMSO, DMF, Aqueous Buffers (pH>6.5)	
1. S.C. Hung et al.; Anal. Biochem. 238, 165 (1996)	

Free acid form of 6-carboxytetramethylrhodamine single isomer.

C-057

5-Carboxytetramethylrhodamine N-succinimidyl ester
(5-TAMRA SE)



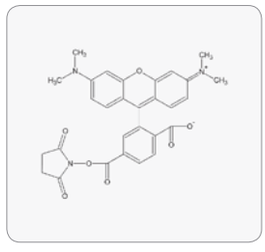
$C_{29}H_{25}N_3O_7$

Molecular Weight	527.52
CAS No	150810-68-7
Dark red solid	
λex 543 nm; λem 578 nm (0.1 M Phosphate pH 7.0)	
Solubility: DMSO, DMF	
1. T.M. Hsu et al.; Clin Chem 47, 1373 (2001)	
2. K.F. Geoghegan et al.; Bioconj. Chem. 11(1), 71 (2000)	
3. D. Proudnikov, A. Mirzabelkov; Nucleic Acids Res. 24, 4535 (1996)	

Amine-reactive form of 5-carboxytetramethylrhodamine single isomer.

C-058

6-Carboxytetramethylrhodamine N-succinimidyl ester
(6-TAMRA SE)



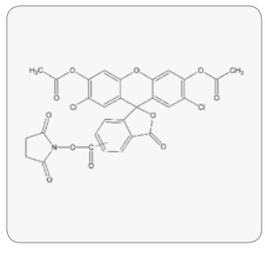
$C_{29}H_{25}N_3O_7$

Molecular Weight	527.52
CAS No	150810-69-8
Dark red solid	
λex 543nm; λem 575m (MeOH)	
Solubility: DMSO, DMF	
1. S.J. Bark et al.; J. Am. Chem. Soc. 122, 3567 (2000)	
2. P. Hoogerhout et al.; J. Pept. Res. 54, 436 (1999)	
3. Y. Wang et al.; Biochemistry 35, 12338 (1996)	

Amine-reactive form of 6-carboxytetramethylrhodamine single isomer used for labeling of peptides and aminoglycoside antibiotics. It is also most commonly used in automated DNA sequencing.

C-059

5(6)-Carboxy-2',7'-dichlorofluorescein diacetate N-succinimidyl ester
(5(6)-Carboxy-DCF DA SE)



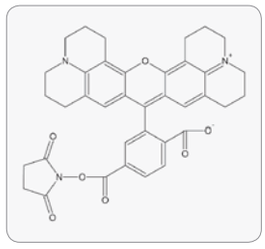
$C_{29}H_{17}Cl_2NO_{11}$

Molecular Weight	626.35
CAS No	147265-60-9
White solid	
λex 470 nm; λem 529 nm (0.1 M Tris pH 8.0, Esterase)	
Solubility: DMSO, DMF	
1. C.M. Griffith et al.; Development 116, 1087 (1992)	

5-(and-6)-Carboxy-2',7'-dichlorofluorescein diacetate, succinimidyl ester is a useful fluorescent tracer that can passively diffuse into cells and covalently label intracellular proteins, resulting in long-term cell labeling.

C-090

6-Carboxy-X-rhodamine N-succinimidyl ester
(6-ROX SE, 6-CXR SE)



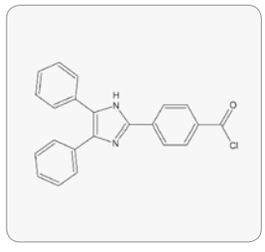
$C_{37}H_{33}N_3O_7$

Molecular Weight	631.67
CAS No	216699-36-4
Dark red solid	
λex 568 nm; λem 595 nm (Methanol)	
Solubility: Methanol, DMSO, DMF	
1. J. Guo et al.; PNAS, 105(27), 9145 (2008)	
2. T.S. Seo et al.; PNAS, 102(17), 5926 (2005)	
3. J.E.T. Corrie et al; J. Chem. Soc. Trans.I., 2975 (1994)	

This rhodamine X derivative is well suited for preparation of labeled primers, which are used in real-time PCR.

D-009

4-(4,5-Diphenyl-imidazol-2-yl)benzoyl chloride
(DIB-Cl)



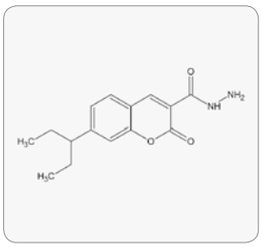
$C_{22}H_{15}ClN_2O$

Molecular Weight	358.82
CAS No	162756-62-9
λex 335 nm; λem 420 nm (Chloroform, after derivatization with hexylamine)	
Solubility: Acetonitrile	
1. M. Wada et al.; Anal. Bioanal. Chem., 391(3), 1057 (2008)	
2. M. Tomita et al.; Biomed. Chromatogr., 20(12), 1380 (2006)	
3. Y. Sun et al.; Analyt. Sci. 17, 697 (2001)	
4. O. Al-Dirbashi et al.; J. Chtomatogr. B 712, 105 (1998)	

4-(4,5-diphenyl-1H-imidazol-2-yl)benzoyl chloride (DIB-Cl) as reagent for amine labelling was used successfully for derivatization and fluorescence detection of enantiomers of methamphetamin and p-hydroxymethamphetamin, in urine samples. It has also been used for 3,4-Methylendioxy-N-methylamphetamin in blood, morpholine and orther compounds.

D-035

7-Diethylaminocoumarin-3-carbohydrazide
(DCCH)



$C_{14}H_{17}N_3O_3$

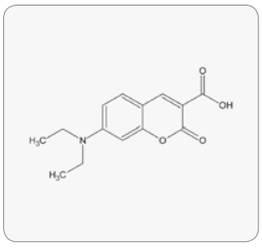
Molecular Weight	275.30
CAS No	100343-98-4
λex 450 nm; λem 468 nm (Methanol)	
Solubility: Methanol, DMF, Acetonitrile, Chloroform	

1. T. Nagase et al.; Chem. Comm. 3, 229 (2001)
2. J.C. Touchstone et al.; Steroids 56(12), 601 (1991)
3. M.L. Grayeski et al.; Anal. Chem. 59, 1203 (1987)

Derivatizing agent for carboxylic acid detection.

D-036

7-Diethylaminocoumarin-3-carboxylic acid



$C_{14}H_{15}NO_4$

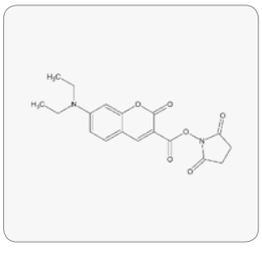
Molecular Weight	261.27
CAS No	50995-74-9
λex 409 nm; λem 473 nm (0.1 M Tris pH 9.0)	
Solubility: DMSO, DMF	
MP: 222-224 °C	

1. K. Usui et al.; Molecular Div., 8(3), 209 (2004)
2. S.L. Timofeevski et al.; Biochem. 41(30), 9654 (2002)
3. E. Koller et al.; Appl. Fluorescent Technol. 4, 18 (1992)

7-(Diethylamino)-coumarin-3-carboxylic acid is a reagent for the derivatisation of amines and proteins. It has also been used for labelling synthetic peptides for high-throughput detection.

D-037

7-Diethylaminocoumarin-3-carboxylic acid N-succinimidyl ester
(DCCS)



$C_{18}H_{18}N_2O_6$

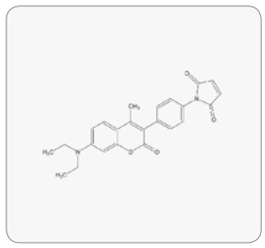
Molecular Weight	358.35
CAS No	139346-57-9
λex 445 nm; λem 482 nm (0.1 M Phosphate pH 7.0)	
Solubility: DMSO, DMF, Acetonitrile	

1. B. Steinberg et al.; 104(22), 9523 (2007)
2. A.K. Bhunia et al.; Chem. Biol. Chem. 8(14), 1642 (2007)
3. T. Higashijima et al.; Anal. Chem. 64, 711 (1992)

Derivatives of 7-aminocoumarins are the most extensively utilized labeling reagents for preparing brightly blue fluorescent conjugates of proteins and nucleic acid. The flourescent-labelling better matches the excitation-wavelength of standard blue lasers than conventional fluorescein-isothiocyyanate.

D-042

7-Diethylamino-3-(4´-maleimidylphenyl)-4-methylcoumarin
(CPM)



$C_{24}H_{22}N_2O_4$

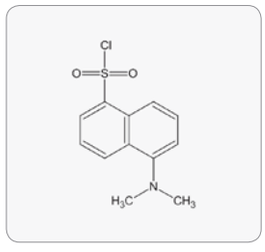
Molecular Weight	402.44
CAS No	76877-33-3
λex 391 nm; λem 472 nm (Methanol/2-mercaptoethanol)	
Solubility: DMSO, DMF, Acetonitrile, Chloroform	

1. C.C. Chung; Assay and Drug Devel. Techn. 6(3), 361 (2008)
2. O. Khersonsky et al.; ChemBioChem 7(1), 49 (2006)
3. J.E.T. Corrie et al.; J. Chem. Soc. Trans., Perkin Trans. 1, 2975 (1994)

CPM is probably the most widely used blue fluorescent thiol-reactive dye. This maleimide derivative of coumarin is essentially nonfluorescent until it reacts with thiols, making it possible to quantify thiols without a separation step. CPM is a good energy acceptor from tryptophan and a good energy donor to fluorescein. Used to monitor release of thiols and to distinguish proliferating cancer cells by nucleolar protein staining.

D-043

Dansyl Chloride
(Dansylchlorid, DNSCl)



$C_{12}H_{12}ClNO_2S$

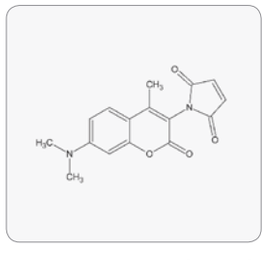
Molecular Weight	269.75
CAS No	605-65-2
λex 337 nm; λem 492 nm (chloroform, after derivatization with hexylamine)	
Solubility: Acetonitrile (50 mg/ml)	
MP: 72 - 74°C	

1. B. Grego et al.; J. Chromatogr. 255, 67 (1983)
2. W.R. Gray et al.; Methods Enzymol. 25, 121 (1972)
3. N. Seiler et al; Methods Biochem. Anal. 18, 259 (1970)
4. J.P. Zanetta et al.; J. Chromatogr. 51, 441 (1970)

A fluorogenic reagent for N-terminal derivatization of amino acids and peptides and detection by reverse phase HPLC.

D-047

N-(7-Dimethylamino-4-methylcoumarin-3-yl)maleimide
(DACM)



$C_{16}H_{14}N_2O_4$

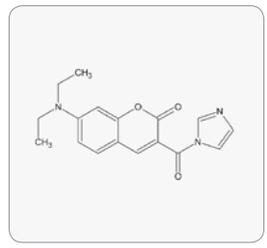
Molecular Weight	298.29
CAS No	55145-14-7
λex 398 nm; λem 482 nm (0.1 M Phosphate pH 7.0, after derivatization with 2-mercaptoethanol)	
Solubility: Water	
MP: 218-220 °C	

1. L. Pollegioni et al.; Arch. of Biochem. Bioph. 343(1), 1 (1997)
2. B. Werneburg et al.; Arch. of Biochem. Bioph. 303(2), 214 (1993)
3. Y. Kanaoka et al.; Angew. Chem. 89, 141 (1977)

Fluorescent reagent with high selectivity for protein thiols and with superior fluorescence and water solubility properties than dansyl chloride.

D-071

7-Diethylaminocoumarin-3 carboxylic acid imidazolide



$C_{17}H_{17}N_3O_3$

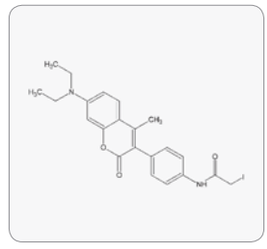
Molecular Weight	311.34
CAS No	261943-47-9
λex 385 nm; λem 574 nm (0.1 M Tris pH 9.0)	
MP: 128 - 130°C	

1. L.-C. Lo et al.; Organic Letters 2(5), 683 (2000)

Flourescent reagent for use in circular dichroic exciton method for derivatisation of hydroxyl-groups under mild conditions. The absorption at 406 nm is futher in the red than for reagents like naphthoylimidazole. The reagent offers high sensitivity through a high molar extinction coefficient.

D-090

7-Diethylamino-3-((4'-(iodoacetyl) amino)phenyl)-4-methylcoumarin
(DCIA)



$C_{22}H_{23}IN_2O_3$

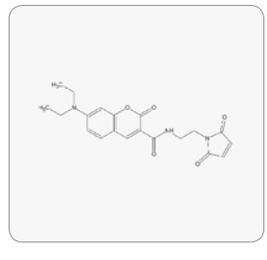
Molecular Weight	490.33
CAS No	76877-34-4
λex 389 nm; λem 467 nm (Methanol)	
Solubility: DMSO, DMF	

1. T. Nagase et al.; Chemistry, A. European Journal 9(15), 3660 (2003)
2. L.D. Burtnick et al.; Canad. J. Chem. 66(8), 1805 (1988)
3. T.O.Sippel et al.; J.Histochem Cytochem. 29(2), 311 (1981)

A label that can be used for preparing maleimide and iodoacetamide derivatives of 3-phenylcoumarin fluorophore. These derivatives can be self-quenching until they react with thiol groups and regain their strong fluorescence.

D-198

7-Diethylamino-3-[N-(2-maleimidoethyl)carbamoyl]coumarin



$C_{20}H_{21}N_3O_5$

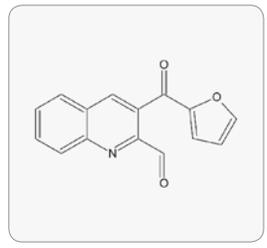
Molecular Weight	383.40
CAS No	156571-46-9
λex 416 nm; λem 477 nm (Methanol)	
Solubility: DMSO, DMF, Chloroform	

1. M. Brune et al.; Biochemistry 40(16), 5087 (2001)
2. M. Hirshberg et al.; Biochemistry 37, 10381 (1998)
3. J.E.T.Corrie et al.; J.Chem.Soc. Trans.I, 2975 (1994)

Thiol-reactive fluorescent probe for protein labeling. MDCC has been used for preparing specific probes for inorganic phosphate.

F-001

3-(2-Furoyl)quinoline-2-carboxaldehyde
(FQ)



$C_{15}H_9NO_3$

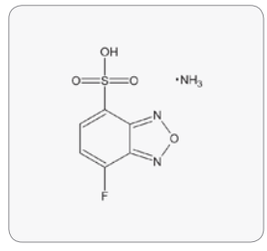
Molecular Weight	251.24
CAS No	126769-01-5
λex 486 nm; λem ~600 nm (0.1 M Sodium borate pH 9.0, after derivatization with glycine)	
assay ≥95% (HPLC)	
Solubility: Methanol	

1. D. Pinto et al.; J. Chrom., B 793(1), 107 (2003)
2. D.P. Richards et al.; J. Chromatog. A. 853, 21 (1999)
3. I.H. Lee et al.; Anal. Chem. 70, 4546 (1998)
4. D.B. Craig et al.; Electrophoresis 19, 2175 (1998)
5. S.C. Beale et al.; J. Chromatog. 499, 579 (1990)

Neutral fluorogenic probe for amines for the picomolar assay of proteins by capillary electrophoresis.

F-002

7-Fluorobenzofurazan-4-sulfonic acid ammonium salt
(SBD-F)



$C_6H_6FN_3O_4S$

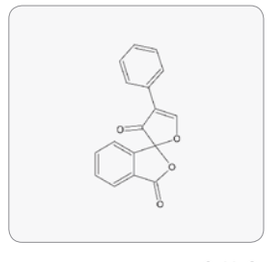
Molecular Weight	235.19
CAS No	84806-27-9
λex 385 nm; λem 524 nm (0.1 M Borate pH 9.5, after derivatization with glutathione)	
Solubility: Water, 1 M Ammonium hydroxide (50 mg/ml)	

1. C. Toriumi et al.; Proc. Japan Acad., Series B, 79(5), 137 (2003)
2. D. Tang et al.; Chim. Acta 408, 299 (2000)
3. T. Toyo'oka et al.; J. Chromatogr. 282, 495 (1983)
4. K. Imai et al.; Anal. Biochem. 128, 471 (1983)

Fluorescent probe for thiols widely used in pre-column labeling of biological thiols for HPLC.

F-003

Fluorescamin
(Fluaram)



$C_{17}H_{10}O_4$

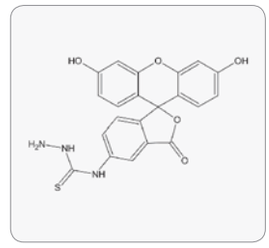
Molecular Weight	278.26
CAS No	38183-12-9
λex 390 nm; λem 475 nm (0.5 M Borate pH 8.5, after derivatization with L-leucine)	
Solubility: Ethanol, Acetonitrile	
MP: 153-157 °C	

1. A.S. Bhown et al.; Anal. Biochem. 112, 158 (1981)
2. K. Sogowa et al.; J. Biochem. Tokyo 83, 1783 (1978)
3. C.Y. Lai et al.; Meth. Enzymol. 47, 236 (1977)
4. S. Stein et al.; Arch. Biochem. Biophys. 155, 202 (1973)
5. S. Udenfriend et al.; Science 178, 871 (1972)

Non-fluorescent reagent that reacts readily under mild conditions with primary amines in amino acids and peptides to form stable, highly fluorescent compounds. Reaction takes place under mild conditions. Low background due to hydrolysis. Useful for the fluorometric assay of amino acids, protein, and proteolytic enzymes. Effectively blocks newly generated amino termini in protein sequence analyses.

F-005

Fluorescein-5-thiosemicarbazide
(5-FTSC)



$C_{21}H_{15}N_3O_5S$

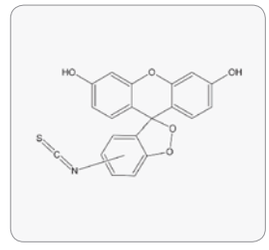
Molecular Weight	421.43
CAS No	76863-28-0
λex 492 nm; λem 516 nm (0.1 M Tris pH 9.0)	
Solubility: Water, DMF	

1. A.R. Chauduri et al.; Mech. Ageing Developm. 127(11), 849 (2006)
2. X. Gao et al.; Bioorg.Chem. 25(3), 163 (1997)
3. J.D. Corbett et al.; Biophys. J. 66, 25 (1994)

Labeling of cell-surface functional groups (glycophorins). Detection of protein carbonyls in aging tissues.

F-010

Fluorescein 5(6)-isothiocyanat, mixture of isomers >90%
(5(6)-FITC)



$C_{21}H_{11}NO_5S$

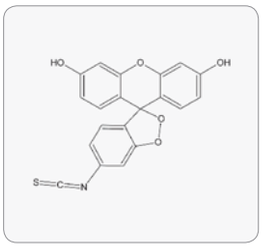
Molecular Weight	389.38
CAS No	27072-45-3
Purity: >90%	
λex 492 nm; λem 518 nm (0.1 M Phosphate pH 8.0)	
Solubility: Aqueous Buffers (pH > 6)	

1. R.W. Dirks et al.; J. Histochem. Cytochem 38, 467 (1990)
2. S. Wu et al.; J. Chromatogr 480, 141 (1989)
3. J.C. Vera et al.; Anal. Biochem 174, 38 (1988)
4. E.T. Thean et al.; Anal. Biochem 177, 263 (1989)
5. D.S. Perlin et al.; J. Biol. Chem 259, 9532 (1984)
6. K.G. Mann et al.; Meth. Enzymol. 26, 28 (1972)
7. H.J.L. Riggs et al.; Am. J. Pathol. 34, 1081 (1958)

For fluorescent labeling of proteins (e.g. immunofluorescence); protein labeling for gel chromatography.

F-011

Fluoresceinisothiocyanate, Isomer I >98%
(FITC Isomer I)



$C_{21}H_{11}NO_5S$

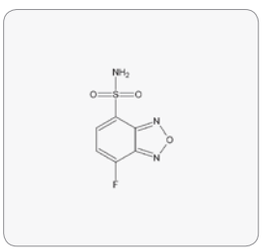
Molecular Weight	389.38
CAS No	3326-32-7
Purity: Isomer I > 98%	
λex 492 nm; λem 518 nm (0,1 M Phosphate pH 8.0)	
Solubility: Aqueous Buffers (pH > 6)	
MP: >360 °C	

1. D-W. Han et al.; Bioorg.& Med. Chem. 16(22), 9652 (2008)
2. L. Miller et al.; Eur. J. Biochem. 174, 23 (1998)
3. G.P. Der-Balian et al.; Anal. Biochem. 173, 59 (1988)
4. K. Muramoto et al.; Anal. Biochem. 141, 446 (1984)
5. A.F. Wilderspin et al.; Anal. Biochem. 132, 449 (1983)

Fluorescent marker for biochemical applications. Reacts under mild conditions with primary amines. Used in modification of actin at lys-61, labelling of FAB and the modification of thiol groups.

F-016

4-Fluoro-7-sulfobenzofurazan
(ABD-F)



$C_6H_4FN_3O_3S$

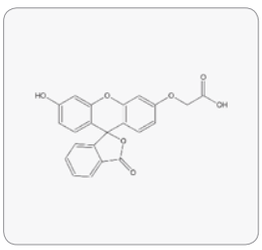
Molecular Weight	217.18
CAS No	91366-65-3
λex 375 nm; λem 521 nm (after derivatization with 2-mercaptoethanol)	
Solubility: 1 N Ammonium hydroxide (50 mg/ml)	

1. R. Karlsson, et al.; Anal. Biochem. 349(1), 136 (2006)
2. R. B. Thompson et al.; J. Neurosc. Meth. 118(1), 63 (2002)
3. T. Toyooka, K. Imai et al.; Anal. Chem. 56, 2461 (1984)

Highly reactive fluorogenic reagent for the labeling of thiols for HPLC. ABD-F is nonfluorescent until reacted with thiols and therefore can be used to quantitate thiols in solution, as well as thiols separated by HPLC or TLC.

F-022

Fluorescein-O-acetate
(FOAA)



$C_{22}H_{14}O_7$

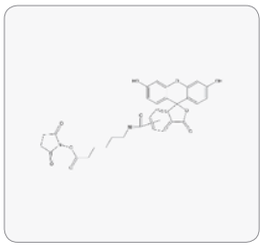
Molecular Weight	390.34
CAS No	233759-98-3
λex 455 nm; λem 514 nm (0.1 M Tris pH 8.0)	
Solubility: DMSO, Acetone	

1. H. Wang et al; Anal. Biochem. 281, 15 (2000)
2. H. Wang et al.; Anal. Chim. Acta 423, 77 (2000)

Fluorescent label which reacts with amines after activation to give isomerically homogeneous derivatives.

F-044

6-[Fluorescein-5(6)-carboxamido] hexanoic acid N-succinimidyl ester
(5(6)-SFX SE)



$C_{31}H_{26}N_2O_{10}$

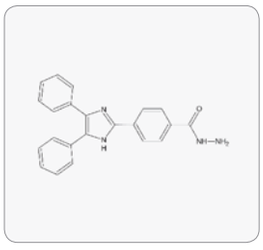
Molecular Weight	586.55
CAS No	114616-31-8
λex 491 nm; λem 515 nm (0.1 M Tris pH 9.0)	
Solubility: Methanol, DMF	

1. J.F. Sierra et al.; Anal. Chim. Acta 414(1-2), 33 (2000)
2. M. Fabry et al.; Peptides (New York) 21(12), 1885 (2000)
3. H. Ueda et al.; BioTechniques 27(4), 738 (1999)

Reagent for introducing the fluorescein label; the spacer renders the reactive group more accessible to nucleophiles on biopolymers.

H-003

2-[4-(Hydrazinocarbonyl) phenyl]-4,5-diphenylimidazole
(HCPI)



$C_{22}H_{16}N_4O$

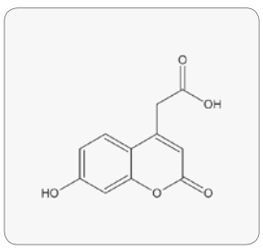
Molecular Weight	354.40
CAS No	151589-38-7
λex 322 nm; λem 470 nm (0.1 M Phosphate pH 7.0)	
Solubility: DMF	

1. C. Sonobe et al.; Bunseki Kagaku 57(8), 631 (2008)
2. N. Kuroda et al.; Analyt. Sci. 11, 989 (1995)
3. K. Nakashima et al.; J. Chromatogr. 619, 1 (1993)

2-(4-Hydrazinocarbonylphenyl)-4,5-dipheny-limidazole (HCPI) as a lophine derivative is a versatile fluorescent derivatization reagent for fatty acids. HCPI has a hydrazinocarbonyl group which reacts with fatty acids resulting in intensely fluorescent derivatives.

H-008

7-Hydroxycoumarinyl-4-acetic acid



$C_{11}H_8O_5$

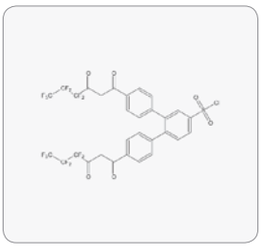
Molecular Weight	220.18
CAS No	6950-82-9
λex 367 nm; λem 455 nm (0.1 M Tris pH 9.0)	
Solubility: Aqueous buffer (pH ≥ 6), DMSO, DMF	
MP: 194-196 °C	

1. K.F. Chilvers et al.; J. Appl. Microb. 91(6), 1118 (2001)
2. E.J.F. Demant et al.; Analyt. Biochem. 267(2), 366 (1999)
3. J.F. Sierra et al.; Analyt. Chim. Acta, 368(1-2), 97 (1998)

7-Hydroxy-4-cumarinylaceticacid is a fluorescence label but can also be used as pH-indicator.

H-041

BHHCT
(BHHCT)



$C_{30}H_{15}ClF_{14}O_6S$

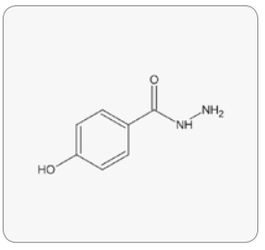
Molecular Weight	804.93
CAS No	200862-70-0
λex 386 nm; λem 613 nm (0.1 M Tris pH 8.0, Eu3+)	
Solubility: DMSO	

1. X. Hai et al.; Anal. Sci. 20, 245 (2004)
2. K. Yoshikawa et al.; Anal. Sci. 15, 121 (1999)
3. J. Yuan et al.; Anal. Sci. 14, 421 (1998)

Sensitive label for time-resolved fluoroimmunoassay via the europium chelate. Ligand for TRF-complexes (with Eu3+) used for preparing Silica-Nanoparticles. This label is characterized by very large Stoke's shift, broad exitation and narrow emission bands.

H-059

4-Hydroxybenzhydrazide



$C_7H_8N_2O_2$

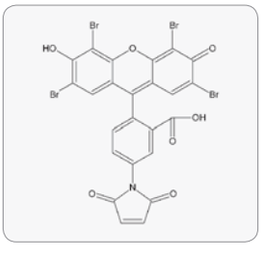
Molecular Weight	152.15
CAS No	5351-23-5
λex 360 nm; λem 425 nm (after reaction with 5-hydroxymethyl-2-furaldehydezinc acetate)	
Solubility: Water	
MP: 264-266 °C	

1. W.J. Schmidt et al.; Appl. Microbiol. Biotech. 21(1-2), 78 (1985)
2. B. Fingerhut et al.; Clin. Chem. 19(9), 1022 (1973)

Reagent for the rapid automated determination of serum glucose.

M-013

Eosin-5-maleimide



$C_{24}H_9Br_4NO_7$

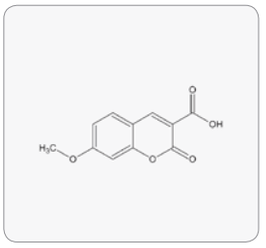
Molecular Weight	742.95
CAS No	75350-45-7
Solubility: Water	
fluorescence: λex 524 nm; λem 545 nm (after derivatization with 2-mercaptoethanol)	

1. M.J. King et al.; British J. Haematol. 124(1), 106 (2004)
2. E. Majima al.; Biochim. Biophys. Acta, 1243(3), 336 (1995)
3. S. Ishiwata et al.; J. biol. Chem.262, 8314 (1987)
4. A.J.W.G. Visser et al.; Eur. J. Biochem. 121, 233 (1981)

Eosin-5-maleimide is a good photosensitizer and can be used to selectively label thiols.

M-016

7-Methoxycoumarin-3-carbonic acid



$C_{11}H_8O_5$

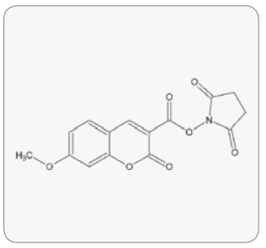
Molecular Weight	220.18
CAS No	20300-59-8
λex 330 nm; λem 402 nm (0.1 M Tris pH 9.0)	
Solubility: DMSO, DMF, Acetonitrile	

1. H. Tetsuia et al.; J . Am. Chem. Soc. 130(27), 8804 (2008)
2. M. Hagihara et al.; J . Am. Chem. Soc.,128(39), 12932 (2006)
3. H. Tetsuia et al.; Pep. Sci. 43, 349 (2006)

Used for labelling oligonucleotides and ribonucleotides.

M-017

7-Methoxycoumarin-3-carbonic acid N-succinimidyl ester



$C_{15}H_{11}NO_7$

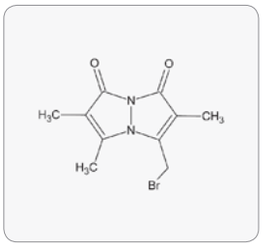
Molecular Weight	317.25
CAS No	150321-92-9
λex 360 nm; λem 410 nm (0.1 M Phosphate pH 7.0)	
Solubility: Methanol, DMF, Acetonitrile	

1. J. Li et al.; Gaodeng Xuexiao Huaxue Xuebao, 27(12), 2297 (2006)
2. A. Pashkova et al.; Analyt. Chem. 77(7), 2085 (2005)

Used for labelling neuropeptides and other peptides.

M-061

Monobromobimane
(mBBr)



$C_{10}H_{11}BrN_2O_2$

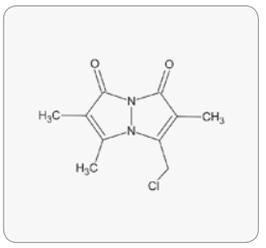
Molecular Weight	271.11
CAS No	71418-44-5
λex 390 nm; λem 478 nm (0.1 M Phosphate pH 7.5, after derivatization with glutathione)	
Solubility: Methanol, DMSO, DMF, Acetonitrile	

1. K.E. Mate et al.; Mol. Reprod. Dev. 37(3), 318 (1994)
2. P. Danielsohn, A. Nolte; Histochemistry 86(3), 281 (1987)
3. N.K. Burton et al.; J. Chromatogr. 309(2), 409 (1984)

Monobromobimane is essentially nonfluorescent until conjugated to target molecule. It readily reacts with several low molecular weight thiols, including glutathione, mercaptopurine, peptides and plasma thiols, as well as with carboxylic acids.

M-063

Monochlorobimane
(mBCl)



$C_{10}H_{11}ClN_2O_2$

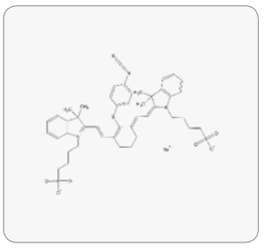
Molecular Weight	226.66
CAS No	76421-73-3
λex 390 nm; λem 478 nm (0.1 M Phosphate pH 7.5, after derivatization with glutathione)	
Solubility: Methanol, DMSO, DMF, Acetonitrile	

1. S. Jayaraman et al.; Cytometry, Part A 73A(7), 615 (2008)
2. J. Waak et al.; Neurochem. Res. 31(12), 1409 (2006)
3. S. Nair et al.; Cytometry 12, 336 (1991)

Cell-permeant probe for quantifying glutathione levels in cells. Generally suitable for the detection of thiol groups.

N-008

NIR-797-isothiocyanate
(NIR-797-ITC)



$C_{48}H_{50}N_3NaO_8S_4$

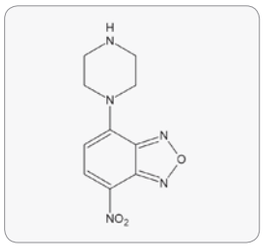
Molecular Weight	880.14
CAS No	152111-91-6
λex 795 nm; λem 817 nm (0.1 M phosphate pH 7.0)	
Solubility: Ethanol	

1. S. Xu et al.; Langmuir 24(14), 7492 (2008)
2. D.B. Shealy et al.; Analyt. Chem. 67, 2 (1995)
3. M. Lipowska et al.; Synt. Comm. 23(12), 3087 (1993)
4. A.E. Boyer et al.; Analyt.Lett. 25(3), 415 (1992)

The reagent, a cyanine dye, can be used as a label for the determination of proteins with NIR-fluorescent technology. The absorption-maxima of the reagent lies in a region of low interference by other biomolecules. The isothiocyanate-moiety is used to link the reagent to proteins which can sensitively be detected. Experiments to lower the detection-limits of immunoassays have been done.

N-014

4-Nitro-7-piperazino benzofurazan
(NBD-PZ)



$C_{10}H_{11}N_5O_3$

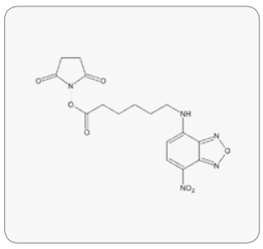
Molecular Weight	249.23
CAS No	139332-66-4
λex 395 nm; λem 561 nm (Acetone)	
Solubility: DMSO	
MP: 208-212 °C	

1. K. Ishiguro et al.; BioTechniques 45(4), 465 (2008)
2. J.-A. Lee et al.; Analytica Chimica Acta 534(2), 185 (2005)
3. A. Ostin et al.; J. Environ. Monit. 5, 100 (2003)
4. M. Vogel et al.; Anal. Chem. 74, 6418 (2002)

Derivatizing agent for the determination of mono- & diisocyanates by LC and MS, UV or fluorescent detection .

N-045

6-(7-Nitrobenzofurazan-4-ylamino) hexanoic acid, N-succinimydylester
(NBD-X SE)



$C_{16}H_{17}N_5O_7$

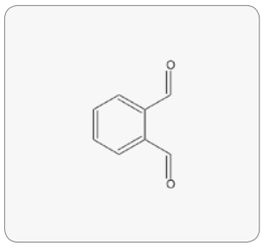
Molecular Weight	391.34
CAS No	145195-58-0
λex 460 nm; λem 540 nm	
Solubility: DMF	

1. F. Eisele et al.; Chem. Eur. J. 8, 3362 (2002)
2. T.H. Huang et al.; J. Biol. Chem. 275, 36436 (2000)
3. S. Ozaki et al.; Proc. Natl. Acad. Sci. USA 97, 11286 (2000)
4. A.E. Johnson et al.; Trends Biochem. Sci. 18, 456 (1993)

Fluorogenic derivatization reagent for amines. NBD-X SE is also a precursor to NBD-labeled phospholipids, NBD C6-ceramide and other probes.

O-008

Phthaldialdehyde
(OPA)



$C_8H_6O_2$

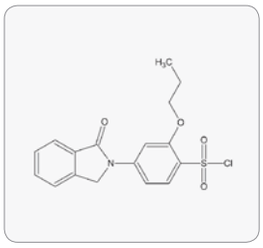
Molecular Weight	134.13
CAS No	643-79-8
λex 340 nm; λem 450 nm (Reaction buffer; Glycine)	
Solubility: Water, Ethanol	
MP: 54-56 °C	

1. S.E. Moeller et al.; J. Chromatogr. 613, 223 (1993)
2. P. Principe et al.; Cytometry 10, 750 (1989)
3. G. Noctor et al.; Metabolomics, 3(2), 161 (2007)
4. A. Koroes et al.; J. Chromatogr. A, 1149(1), 46 (2007)

Widely used for precolumn derivatization of amino acids in HPLC separation or Capillary electrophoresis. For flow cytometric measurements of protein thiol groups.

P-008

2-Propoxy-4-(N-phthalimidinyl) benzenesulfonyl chloride
(PPS-Cl)



$C_{17}H_{16}ClNO_4S$

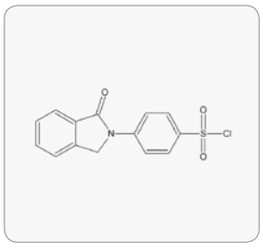
Molecular Weight	365.83
CAS No	277758-55-1
λex 300 nm; λem 418 nm (Acetonitrile, after derivatization with hexylamine)	
Solubility: Acetonitrile	
MP: 178-181 °C	

1. Y. Tsuruta et al.; Anal. Biochem. 280, 36 (2000)

Reagent for the pre-column derivatization of phenols and amines.

P-009

4-(N-Phthalimidyl)-benzensulfonyl chloride
(Physil chloride)



$C_{14}H_{10}ClNO_3S$

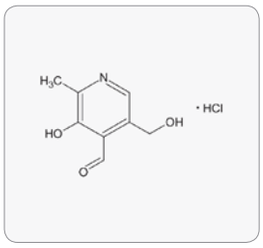
Molecular Weight	307.75
CAS No	114341-14-9
λex 300 nm; λem 416 nm (Methanol, after derivatization with hexylamine)	
Solubility: Acetone	

1. Y. Tsuruta et al.; Anal. Biochem. 243, 86 (1996)
2. Y. Tsuruta et al.; J. Chromatogr. 502, 178 (1990)
3. O.M. Bakke et al.; Toxicol. Appl. Pharmacol. 16, 691 (1970)
4. C.N. Ong et al.; J. Chromatogr. 660, 1 (1959)
5. R. Boutwell et al.; Cancer Res. 19, 413 (1959)

Fluorescent labelling reagent for sensitive detection of phenol, p-cresol (known as promotors of skin tumors and other interesting impacts) and amino acids in HPLC.

P-118

Pyridoxal hydrochloride



$C_8H_9NO_3 \cdot HCl$

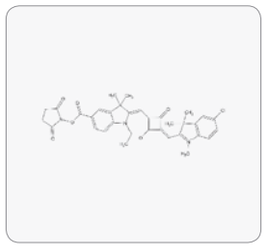
Molecular Weight	203.62
CAS No	65-22-5
λex 330 nm; λem 385 nm	
Solubility: Water (50 mg/ml)	
MP: 173 °C	

1. D. Dolphin et al.; Chem., Biochem. Med. Aspects New York, 725 (1986)
2. N. Lustenberger et al.; Angew. Chem. 84, 225 (1972)

For the labeling of amino acids and their detection in picomolar amounts.

S-003

Squarain-carboxylate N-succinimidyl ester
(SQ-NHS)



$C_{34}H_{32}ClN_3O_6$

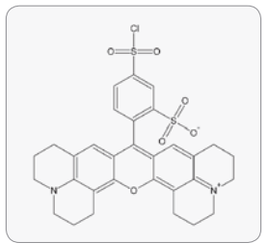
Molecular Weight	614.09
CAS No	154161-81-6
λex 600 nm; λem 645 nm (0.1 M Phosphate pH 7.0)	
Solubility: DMF	

1. E. Terpetschnik et al.; Analyt. Biochem. 217(2), 197 (1994)
2. E. Terpetschnik et al.; Proc. of SPIE-The Intern. Soc. Opt. Eng. 2137, 608 (1994)
3. E. Terpetschnik et al.; J. Fluorescence 3(3), 153 (1993)

A stable long-wavelength fluorescent label for proteins and other amines.

S-008

Sulforhodamine 101 acid chloride
(Texas Red)



$C_{31}H_{29}ClN_2O_6S_2$

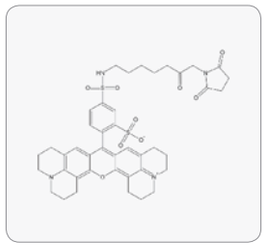
Molecular Weight	625.15
CAS No	82354-19-6
Dark purple solid	
λex 583 nm; λem 603 nm	
Solubility: DMF (Caution: Do not dissolve in DMSO)	

1. Y. Zhang et al.; Analyt. Chem. 81(10), 3731 (2009)
2. D.M. Sipe et al.; J. Biol. Chem. 266, 3469 (1991)
3. H. Hachisuka et al.; Acta Histochem 89(1), 85 (1990)
4. J.A. Titus et al; J. Immunol. Methods. 50(2), 193 (1982)

Sulforhodamine 101 sulfonyl chloride (also called Texas Red sulfonyl chloride) is a popular long wavelength amine-reactive rhodamine dye. Because the dye is quite unstable in water, reactions with amines in an aqueous solution must be carried out at low temperature (over ice or at 4°C) and usually at pH 8.5.

S-009

Sulforhodamine 101 acid N-succinimidyl ester
(Texas Red SE)



$C_{41}H_{44}N_4O_{10}S_2$

Molecular Weight	816.94
	CAS No
λex 595 nm; λem 615 nm	
Solubility: DMF (Caution: Do not dissolve in DMSO)	

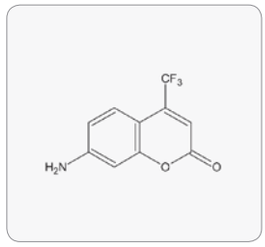
1. M.A. de Pedro et al.; J. Biotechn., 1147 (2003)
2. P.C.Y. Liaw et al.; JBC 275(8), 5447 (2000)

Widely used fluorescent label for proteins.

Enzyme Substrates

A-029

7-Amino-4-trifluoromethylcoumarin
(AFC)



$C_{10}H_6F_3NO_2$

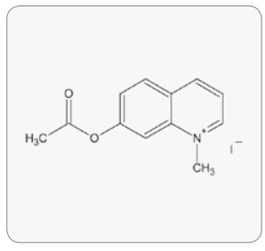
Molecular Weight	229.16
CAS No	53518-15-3
λex: 382 nm; λem: 480 nm	
Solubility: DMSO	
MP: 221-222 °C (lit.)	

1. T. Knuettel et al.; Enzyme Microb. Techn. 37(7), 673 (2005)
2. C. R. Moylan et al.; J. Phys. Chem. 98(51), 13513 (1994)
3. R.E. Smith et al.; Thrombosis Research 17(3-4), 393 (1980)

This dye is used to prepare peptidase substrates and for the synthesis of substrates for the fluorometric assay of proteolytic enzymes in biological fluids.

A-036

7-Acetoxy-1-methyl-quinolinium iodid



$C_{12}H_{12}INO_2$

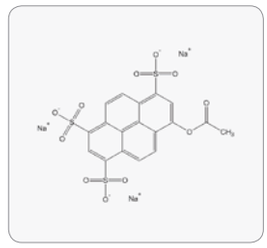
Molecular Weight	329.13
CAS No	7270-83-9
λex 403 nm; λem 502 nm (0.1 M Tris pH 8.0, after cleavage by acetylcholin esterase)	
Solubility: DMSO, DMF	
MP: 222 °C (lit.)	

1. F. Caturla et al.; Tetrahedron 60(8), 1903 (2004)
2. I.K. Rhee et al.; Verpoorte, Phytochemical Analysis 14(3), 145 (2003)
3. C.D. Voorhorst; Biochemical Pharmacology 20(6), 1321 (1971)

Fluorogenic substrate for cholinesterase. Non-fluorescent 7-acetoxy-1-methyl quinolinium iodide is hydrolysed to the highly fluorescent 7-hydroxy-1-methyl quinolinium iodide.

A-172

8-Acetoxypyrene-1,3,6-trisulfonic acid trisodium salt



$C_{18}H_9Na_3O_{11}S_3$

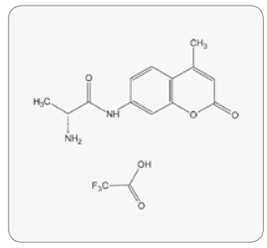
Molecular Weight	566.42
CAS No	115787-83-2
Purity: ≥ 98% (TLC)	
λex 460 nm; λem 510 nm (0.1 M Potassium phosphate pH 8.0, with esterase)	
Solubility: Water, DMSO, DMF	
MP: 238-248 °C (dec.)(lit.)	

1. E. Delort et al.; J. Org. Chem., 71(12), 4468 (2006)
2. E. Delort et al.; J. Am. Chem. Soc., 126(48), 15642 (2004)
3. O. S. Wolfbeis et al.; Anal. Biochem. 129, 365 (1983)

Highly water soluble enzyme substrate for the fluorometric assay of esterases at longer wavelengths.

A-173

L-Alanine-4-methyl-7-coumarinyl-amide trifluoroacetate salt



$C_{13}H_{14}N_2O_3 \cdot C_2HF_3O_2$

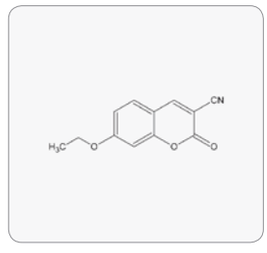
Molecular Weight	360.29
CAS No	96594-10-4
λex 325 nm; λem 389 nm (Ethanol)	
Solubility: Ethanol (50 mg/mL, clear, colorless)	
[α]20/D +6±1°, c = 1% in methanol	

1. S. Knotz et al.; Comp. Biochem. Phys., Part A 145A(3), 406 (2006)
2. D. Mantle et al.; Biochem. J. 211, 567 (1983)

Fluorogenic peptidase substrate, hydrolysis results in longer wavelength excitation and emission spectrum (λex 380nm, λem 440nm).

C-092

3-Cyano-7-ethoxycoumarin



$C_{12}H_9NO_3$

Molecular Weight	215.20
CAS No	117620-77-6
λex 324 nm; λem 414 nm (DMSO)	
Solubility: DMSO	

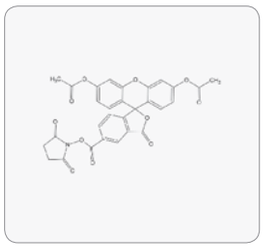
1. M.T. Donato et al.; Drug Metabol. Disp., 32(7), 699 (2004)
2. C.L. Crespi et al.; Anal. Biochem., 248(1), 188 (1997)
3. I.N.H. White et al.; Anal. Biochem., 172(2), 304 (1988)

Substrate for determination of cytochrom P-450 dependent oxidases; about 50-100 times more sensitive than conventional substrate ethoxy-resorufin due to higher turn over rate.

C-094

5-Carboxyfluorescein diacetate N-succinimidyl ester

(5-FAM DA SE)



$C_{29}H_{19}NO_{11}$

Molecular Weight	557.46
CAS No	150206-05-6

λex 492 nm; λem 517 nm (0.1 M Tris pH 8.0, after cleavage by esterase)

Solubility: DMSO, DMF

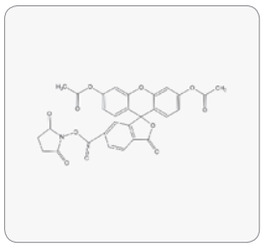
1. G.O. Bakhus. Et al.; Immunologiya 23(3), 190 (2002)
2. H.E. Gruber et al.; Biotech. Histochem. 75, 118 (2000)
3. P. Breeuwer et al.; Appl. Environ. Microbiol. 62, 178 (1996)
4. S. Boitano et al.; J. Cell Sci. 98, 343 (1991)

5-CFDA is membrane-permeant and can be loaded into cells via incubation. Once inside the cells, 5-CFDA is hydrolyzed by intracellular esterases to 5-carboxyfluorescein. It has been used for labeling human intervertebral disk cells in vitro for fluorescence microscopy. Continuous determination of the intracellular pH in bacteria by fluorometry.

C-095

6-Carboxyfluorescein diacetate N-succinimidyl ester

(6-FAM DA SE)



$C_{29}H_{19}NO_{11}$

Molecular Weight	557.46
CAS No	150206-15-8

λex 492 nm; λem 517 nm (0.1 M Tris pH 8.0, after cleavage by esterase)

Solubility: DMSO, DMF

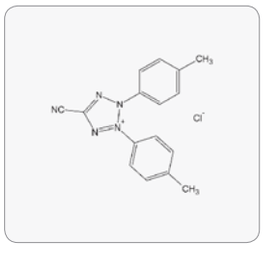
1. G.O. Bakhus. et al.: B.V. Pinegin; Immunologiya 23(3), 190 (2002)
2. H.E. Gruber et al.; Biotech. Histochem. 75, 118 (2000)
3. P. Breeuwer et al.; Appl. Environ. Microbiol. 62, 178 (1996)
4. C.S. Chen et al.; JBC, 268(21), 15812 (1993)

6-CFDA is membrane-permeant and thus can be loaded into cells via incubation. Once inside the cells, 6-CFDA is hydrolyzed by intracellular esterases to 6-carboxyfluorescein. Reagent for continuously determining the intracellular pH in bacteria by fluorometry. Labeling human intervertebral disk cells in vitro for fluorescence microscopy.

C-104

5-Cyano-2,3-di-(p-tolyl)tetrazolium chloride

(CTC)



$C_{16}H_{14}ClN_5$

Molecular Weight	311.77
CAS No	90217-02-0

λex 450 nm; λem 630 nm (Formazan)

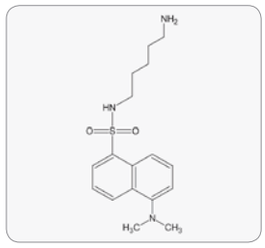
Solubilty: Water (50 mM)

1. D.H. Kim et al.; Biotechnol. Lett. 31(2), 271 (2009)
2. G.G. Rodriguez et al.; Appl. Environ. Microbiol. 58, 180 (1992)
3. E. Severin et al.; Anal. Chim. Acta 170, 34 (1985)

Redox dye producing a fluorescent formazan (only in solid state) upon reduction. It is used as cellular indicator of respiratory activity in cells, especiall for tracking P450 activity.

D-292

Dansylcadaverine



$C_{17}H_{25}BN_3O_2S$

Molecular Weight	335.46
CAS No	10121-91-2

λex 335 nm; λem 512nm (Methanol)

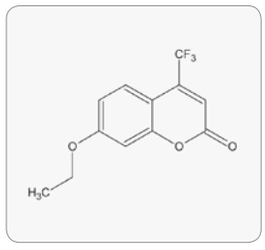
Solubility: Acetic acid (50 mg/ml)

1. E. Sokullu et al.; Food Biotechnol. 22(3), 297 (2008)
2. V Massey et al.; J. Biol. Chem. 269, 22907 (1994)
3. L. Lorand et al.; Anal. Biochem. 44, 207 (1971)

Fluorescent substrate for the assay of transamidating enzymes.

E-003

7-Ethoxy-4-trifluoromethylcoumarin



$C_{12}H_9F_3O_3$

Molecular Weight	258.19
CAS No	115453-82-2

λex 333 nm; λem 415 nm (Methanol)

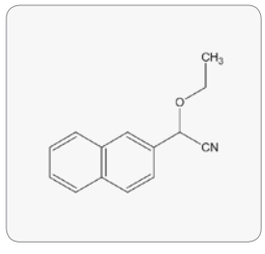
Solubility: Methanol, DMSO, DMF

1. N. Oezguen et al.; JBC 283(31), 21808 (2008)
2. K.A. Regal et al.; Chem. Res. in Toxic. 13(4), 262 (2000)
3. J.T.M. Buters et al.; Biochem. Pharmacol. 46, 1577 (1993)

Substrate for monitoring the activity of cytochrome P450 in diverse cells and research issues, including in vitro cytotxity testing, regulation and drug metabolization.

E-031

2-Ethoxy-2-(2-naphthyl)ethanenitril



$C_{14}H_{13}NO$

Molecular Weight	211.26
CAS No	33224-80-5

λex 227 nm; λem 336 nm (Methanol)

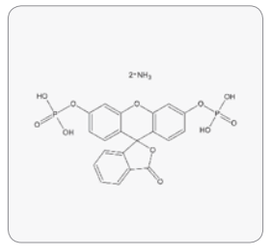
1. K.D. Kang et al.; Anal. Biochem. 344(2), 183 (2005)
2. R. Zhang et al.; Tetr. Lett. 44, 4331 (2003)

This is a new substrate for Cytochrom P450 suitable for fluorescence assays.

F-007

Fluorescein-diphosphat diammonium salt

(FDP)



$C_{20}H_{20}N_2O_{11}P_2$

Molecular Weight	526.33
CAS No	197777-66-5

λex 491 nm; λem 513 nm (0.1 M Tris pH 8.0, Phosphatase)

Solubility: Water

MP: 230-240 °C

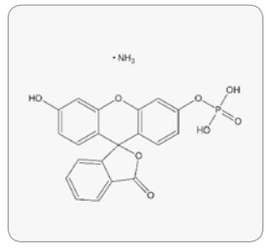
1. J. Scheigetz et al.; Org. Prep. Proc. Int. 29, 561 (1997)
2. Z.-Y- Zhang et al.; Adv. Enzymol. 68, 1 (1994)
3. D. Robinson et al.; Biochem. Soc. Trans. 16, 11 (1988)

Suitable as fluorogenic substrate for phosphatases.

F-008

Fluorescein-monophosphat monoammonium salt

(FMP)



$C_{20}H_{16}NO_8P$

Molecular Weight	429.32
CAS No	197777-68-7

λex 491 nm; λem 513 nm (0.1 M Tris pH 8.0, Phosphatase)

Solubility: Water

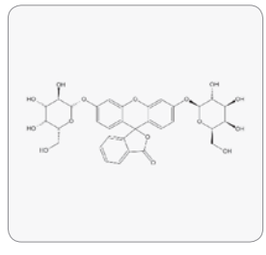
1. Z.-Y- Zhang et al.; Adv. Enzymol. 68, 1 (1994)

Fluorescein-diphosphat monoammonium salt (FMP) is an attractive fluorescence substrate for various enzyme assays and is ideally suited due to its high extinction coefficients and fluorescence quantum yields.

F-031

Fluorescein di-ß-D-galactopyranoside

(FDG)



$C_{32}H_{32}O_{15}$

Molecular Weight	656.59
CAS No	17817-20-8

λex 490 nm; λem 514 nm (0.1 M Tris pH 8.0, β-galactosidase)

Solubility: Water, Ethanol, DMSO, DMF

MP: 200-203°C

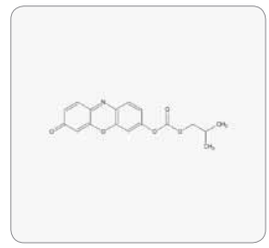
1. N.-C.Yang et al.; Anal. Biochem. 325(2), 337 (2004)
2. F. Fieldler et al.; Europ. J. Biochem. 222(1), 75 (1994)
3. J. Hofmann et al.; Anal. Biochem. 131(1), 180 (1983)

Ultra sensitive fluorogenic substrate for β-galactosidase, used in live cell and tissue (in vivo and in vitro) assays. This fluorescent substrate reagent could be used for monitoring kinetics of hydrolysis.

I-005

7-(Isobutyloxycarbonyloxy)-3H-phenoxazin-3-one

(Resorufin-isobutyrat)



$C_{17}H_{15}NO_5$

Molecular Weight	313.30
CAS No	251292-24-7

λex 500 nm; λem ~593 nm (0.1 M Tris pH 8.0, after cleavage by esterase)

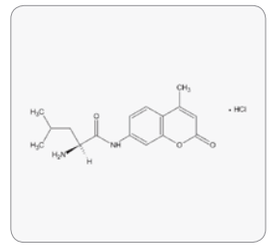
Solubility: DMSO

1. M. Ishiyama et al.; Analyt. Sci. 15, 1025 (1999)

7-(isobutoxycarbonyloxy)-3H-phenoxazin-3-one is a resorufin derivative used as a fluorogenic indicator for cell viability. Incubation with esterase at pH 8,0 results in a 80-90 nm shift of emission maxima. This cell viability indicator is 2 times more sensitive than calcein-AM.

L-003

L-Leucin-7-amido-4-methyl-coumarin-hydrochlorid



$C_{16}H_{20}N_2O_3 \cdot HCl$

Molecular Weight	324.80
CAS No	62480-44-8

λex 325 nm; λem 397 nm (0.1 M Tris pH 8.0)

λex 380 nm; λem 440 nm (after digestion with leucine aminopeptidase)

Solubility: Methanol

Optical Activity: [α]20/D +62.0±2.0°, c = 1% in methanol

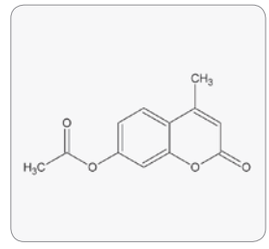
1. R. Zaccone et al.; Marine Environm. Res. 54(1), 1 (2002)
2. L. Stepaniak; J. Food Prot. 63(10), 1447 (2000)
3. Y. Kanaoka et al.; Chem. Pharm. Bull. 33(4), 1721 (1985)
4. Y. Kanaoka et al.; Chem. Pharm. Bull. 25, 362 (1977)

Fluorogenic substrate for leucine aminopeptidase. Sensitivity of fluorescence detection is greatly increased over other methods such as 4-Methoxy-naphthylamide (pNA) assays.

M-010

4-Methylumbelliferyl acetate

(MU-Ac)



$C_{12}H_{10}O_4$

Molecular Weight	218.21
CAS No	2747-05-9

λex 365 nm; λem 445 nm (0.1 M Tris pH 8.0, Esterase)

Solubility: DMSO, DMF

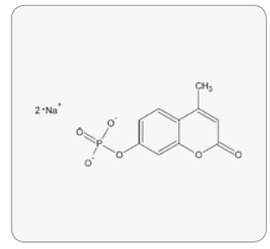
MP: 145-150°C

1. I. Cummins et al.; Phytochem. 68(6), 811 (2007)
2. M. Gershater et al.; Phytochem. 67(23), 2561 (2006)
3. C. Dive et al.; Cytometry 8, 552 (1987)
4. E. Pastoriza-Munoz et al.; J. Clin. Invest. 80, 207 (1987)

Fluorogenic substrate for esterases, broadly applied to various types of esterases., including carboxyesterases. Measurement of intracellular pH in rat proximal convoluted tubule.

M-012

4-Methylumbelliferyl phosphate disodium salt



$C_{10}H_7Na_2O_6P$

Molecular Weight	300.11
CAS No	22919-26-2

λex 365 nm; λem 445 nm (0.1 M Tris pH 8.0, Phosphatase)

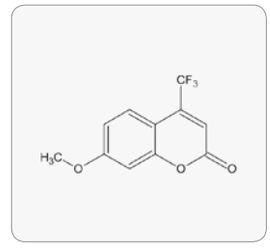
Solubility: Water (50 mg/ml)

1. A. Hirose et al.; Chem. Lett. (Jpn) 2, 307 (1993)
2. H.N. Fernley et al.; Biochem. J. 97, 95 (1965)

Fluorogenic substrate for phosphatases.

M-015

7-Methoxy-4-(trifluoromethyl)coumarin



$C_{11}H_7F_3O_3$

Molecular Weight	244.17
CAS No	575-04-2

λex 333 nm; λem 416 nm (Methanol)

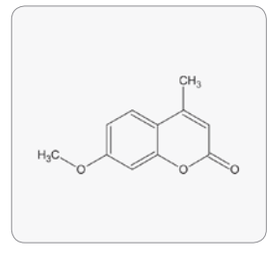
Solubility: Ethanol, Methanol, DMSO, DMF

1. M.T. Donato et al.; Drug Metabol. Dispos. 32(7), 699 (2004)
2. M. Matsui et al.; Chem. Ber. 125(2), 467 (1992)

Fluorescent substrate for oxidoreductases, especially for Cytochrome P450.

M-046

7-Methoxy-4-methylcoumarin



$C_{11}H_{10}O_3$

Molecular Weight	190.20
CAS No	2555-28-4

λex 324 nm; λem ~386 nm (0.1 M phosphate pH 7.0)

Solubility: Alcohols, DMF, Acetonitrile, Chloroform

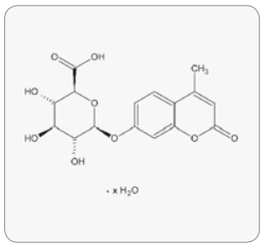
MP: 158-160 °C

1. J.R. Frey et al.; Xenobiotica 34(8), 707 (2004)

Used for determination of Cytochrome P450 activity.

M-076

4-Methylumbelliferyl ß-D-glucuronide hydrate



$C_{16}H_{16}O_9 \cdot xH_2O$

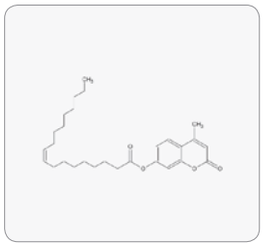
Molecular Weight	352.29 (anhyd.)
CAS No	6160-80-1
λex 365 nm; λem 445 nm (0.1 M Phosphate pH 6.5)	
Solubility: DMSO	

1. R.B. Thompson et al.; Anal. Lett. 18, 1847 (1985)
2. J.H. Glaser et al.; J. Lab. Clin. Med. 82(6), 969 (1973)

Substrate for β-D-glucuronidase assay. MUG is widely used as component of selective microbial culture media.

M-086

4-Methylumbelliferyl oleate



$C_{28}H_{40}O_4$

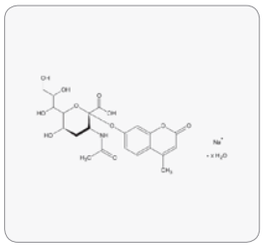
Molecular Weight	440.61
CAS No	18323-58-5
λex 327 nm; λem 449 nm (0.1 M Phosphate pH 7.0, Lipase)	
Solubility: 2-Methoxyethanol, DMSO, Chlorofom	
MP: 37-38 °C	

1. N. Prim et al.; J. Mol. Cat. B: Enzymatic 22(5-6), 339 (2003)
2. N. Prim et al.; BioTechniques 27(4), 696 (1999)
3. T.J. Jacks et al.; Anal. Biochem. 21, 279 (1967)

Fluorogenic substrate for lipases.

M-096

4-Methylumbelliferyl-N-acetyl-a-D-neuraminic acid Sodium salt Dihydrate



$C_{21}H_{24}NNaO_{11} \cdot xH_2O$

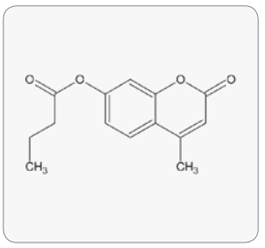
Molecular Weight	489.41
CAS No	76204-02-9
λex 365 nm; λem 445 nm (after cleavage by neuraminidase)	
Solubility: Water (50 mg/ml)	

1. G. Paris et al.; Glycobiology 11, 4, 305 (2001)
2. C.R. Lambre et al.; Vaccine 72, 104 (1989)

This compound has been used for fluorometric assay of neuraminidase as well as fluorescent staining of sialidases in PAGE.

M-097

4-Methylumbelliferyl butyrate
(MU-Bu)



$C_{14}H_{14}O_4$

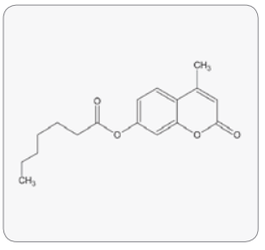
Molecular Weight	246.26
CAS No	17695-46-4
λex 365 nm; λem 445 nm (0.1 M Tris pH 8.0, Lipase)	
Solubility: DMSO, DMF	
MP: 90-92 °C	

1. M. Mueller-Santos et al.; Anal. Biochem. 351(2), 305 (2006)
2. N. Prim et al.; J. Mol. Cat. B: Enzymatic 22(5-6), 339 (2003)
3. L. Virág et al.; J. Immunol. Meth. 185(2), 199 (1995)
4. M. Vaneechoutte et al.; J. Clin. Microbiol. 26, 1227 (1988)

Fluorogenic substrate for butyrate esterase.

O-007

4-Methylumbelliferyl heptanoate



$C_{17}H_{20}O_4$

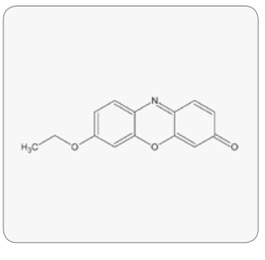
Molecular Weight	288.34
CAS No	18319-92-1
λex 365 nm; λem 445 nm (0.1 M Tris pH 8.0, Lipase)	
Solubility: Alcohols, DMF	
MP: 41-42 °C	

1. E. Nyfeler et al.; Helv. Chim. Acta 86(8), 2919 (2003)
2. W. Tsuzuki et al.; Biosc., Biotechn., and Biochem. 67(8), 1660 (2003)
3. G.G. Guilbault et al.; Anal. Chem. 41, 2006 (1969)

Fluorogenic substrate for lipases.

R-013

Resorufin ethyl ether
(Ethoxyresorufin)



$C_{14}H_{11}NO_3$

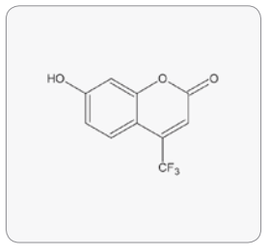
Molecular Weight	241.24
CAS No	5725-91-7
λex 464 nm; λem 540 nm (Methanol)(lit.)	
λex 571 nm; λem 585 nm (Dealkylase)	
Solubility: Alcohols, DMSO, DMF	
MP: 223-225 °C	

1. Z. Taira et al.; Cell Bio. Toxic. 23(3), 143 (2007)
2. J.J. Reiners et al.; Anal. Biochem. 188, 317 (1990)
3. M.D. Burke et al.; Biochem. J. 212, 15 (1983)

Dealkylase substrate for the microfluorimetric analysis of microsomal cytochrome P-450.

T-003

4-(Trifluoromethyl)umbelliferone
(TFMU, Coumarin 174)



$C_{10}H_5F_3O_3$

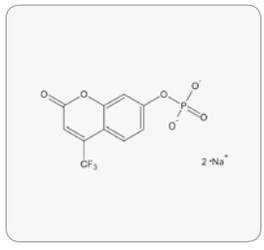
Molecular Weight	230.14
CAS No	575-03-1
λex 355 nm; λem 498 nm (0.1 M Citrate pH 3.0)	
Solubility: Alcohols, DMSO, DMF	
MP: 178-180 °C	
pKa: 7.26	

1. P. Baranczewski; Assay and Drug Developm. Techn. 2(4), 345 (2004)
2. A.B. Renwick; Xenobiotica 30(10), 955 (2000)
3. G. Luyten et al.; J. Histochem. Cytochem. 33, 965 (1985)

Suitable as pH-indicator. Trifluoromethylumbelliferone is a slightly longer wavelength analog of 4-methylcoumarin (4-MU) with a pKa that more closely matches physiological pH values.

T-007

4-(Trifluoromethyl)umbelliferyl phosphate disodium salt



$C_{10}H_4F_3Na_2O_6P$

Molecular Weight	354.08
CAS No	352525-17-8
λex 410 nm; λem 503 nm (0.1 M Tris pH 9.0, Alkaline phosphatase)	
Solubility: Water, DMSO	

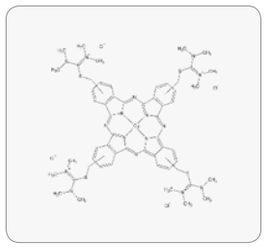
1. G.G. Guilbault et al.; Anal. Lett. 1(5), 333 (1968)

Suitable as fluorogenic substrate for alkaline phosphatase.

Live Cell Stains

A-001

Alcian Blue 8GX
(Alcian Blue 8GX)



$C_{56}H_{68}Cl_4CuN_{16}S_4$

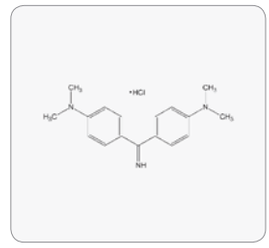
Molecular Weight	1298.87
CAS No	33864-99-2
Absorption maximum: 615 nm	
Solubility: Water (9.5%), Ethanol (6.0%)	
Our product is certified by Biological Stains Commission under CxAn-1	

1. S. Mozersky et al.; J. Am. Leather Chem. Assoc. 98(9), 337 (2003)
2. M. Hattori et al.; Bunseki Kagaku 52(4), 259 (2003)
3. P. Whiteman et al.; Biochem. J. 131(2), 343 (1973)

Alcian blue 8GX is primarily used for demonstrating acid mucopolysaccharides, which it does quite selectively. Alcian Blue 8GX is also suitable for detection of glycoproteins on nitrocellulose and in PAGE gels.

A-162

Auramine O
(Pyoctaninum aureum)



$C_{17}H_{21}N_3 \cdot HCl$

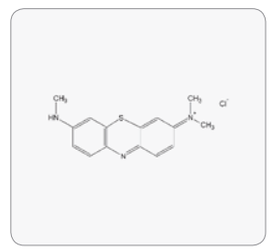
Molecular Weight	303.83
CAS No	2465-27-2
λex: 438 nm; λem 505 nm	
Solubility: Water (10 mg/ml)	
MP: >250 °C	

1. D.P. Penny et al.; Histochem. 77(5&6), 237 (2002)
2. M. Arrowood et al.; J. Clin. Microbiol. 27(7), 1490 (1989)
3. S. Kommareddi et al.; Hum. Pathol. 15(11),1085 (1984)

Certified for use by fluorescence microscopy in Churukian's modification of Truant's fluorescent method for acid fast bacilli on paraffin sections.

A-164

Azure B
(Methyleneazure; N,N,N'-Trimethylthionin)



$C_{15}H_{16}ClN_3S$

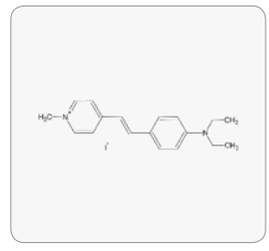
Molecular Weight	305.83
CAS No	531-55-5
Solubility: Water	
MP: 205-210 °C (dec.)(lit.)	

1. Y.F. Li et al.; Anal. Chim. Acta 452(2), 285 (2002)
2. M. Bins et al.; Blut 58, 79 (1989)

Used for staining reticulocytes. Azure B is used for preparing azure eosin stains for blood smears.

D-012

4-(4-Diethylaminostyryl)-1-methylpyridinium iodide
(4-Di-2-ASP)



$C_{18}H_{23}IN_2$

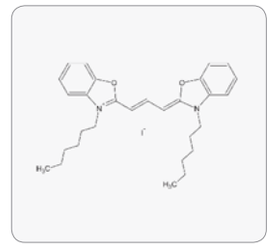
Molecular Weight	394.29
CAS No	105802-46-8
λex 485 nm; λem 603 nm (Methanol)	
Solubility: DMSO, DMF, Chloroform	
MP: 214-216°C (lit.)	

1. C. Seebacher et al.; Adv. Mat. 13(18), 1374 (2001)
2. R.S. Wilkinson et al.; J. Neurosci. 14, 3319 (1994)
3. L. Chen et al.; J. Neurosci. 14, 796 (1994)
4. M.B. MacIver et al.; J. Neurosci. 13, 4511 (1993)
5. A.A. Herrera et al.; J. Neurocytol. 19, 67 (1990)
6. C.A. Nurse et al.; Cell Tissue Res. 255, 125 (1989)
7. J.W. Lichtman et al.; J. Neurosci. 7, 1215 (1987)

Some cationic mitochondrial dyes such as 4-Di-1-ASP and 4-Di-2-ASP stain presynaptic nerve terminals independent of neuronal activity.

D-129

3,3'-Dihexyloxacarbocyanine iodide
(DiOC6(3))



$C_{29}H_{37}IN_2O_2$

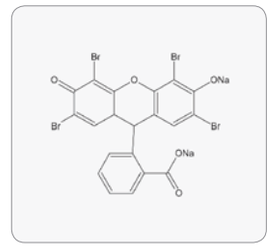
Molecular Weight	572.52
CAS No	53213-82-4
λex 484 nm; λem 501 nm (Phosphate buffer/SDS pH 7.0)	
Solubility: Ethanol	
MP: 219-221 °C	

1. E.J. Buenz et al.; Cytometry, Part A 71A(3), 170 (2007)
2. M. Kataoka et al.; Electrophoresis 26(15), 3025 (2005)
3. C. Lee et al.; Cell 54, 37 (1988)
4. H.-L. Jenssen et al.; Cytometry 7, 339 (1986)

Endoplasmic Reticulum-Tracker dye is a cell-permeant, live-cell stain that is highly selective for the ER. This dye rarely stain mitochondria, unlike the conventional ER stain DiOC6(3) and staining at low concentrations does not appear to be toxic to cells. Electron transport inhibitor and useful probe for studying multidrug resistant cells.

E-044

Eosin Y disodium salt
(Eosin Y)



$C_{20}H_6Br_4Na_2O_5$

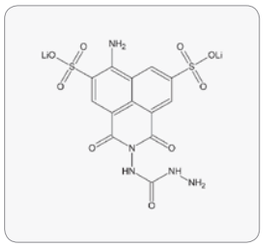
Molecular Weight	691.85
CAS No	17372-87-1
1% (w/v) (in ethanol:water 4:1)	
Density: 0.870 g/ml at 20 °C	

1. H-Y. Hong et al.; Anal. Lett. 32(12), 2427 (1999)
2. L. Fan et al.; Anal. Biochem. 196(2), 279 (1991)
3. G. Clark et al.; Staining Procedures 4th ed., 37 (1981)

Eosin is most often used as a counterstain to haematoxylin in H&E (haematoxylin and eosin) staining. H&E staining is one of the most commonly used techniques in histology.

L-007

Lucifer Yellow CH Dilithium salt



$C_{13}H_9Li_2N_5O_9S_2$

Molecular Weight	457.25
CAS No	67769-47-5
λex 428 nm; λem 518 nm	
Solubility: Water	

1. H. Riezman et al.; Cell 40, 1001 (1985)
2. W.W. Stewart et al.; Nature 292, 17 (1981)
3. W.W. Stewart et al.; Cell 14, 741 (1978)

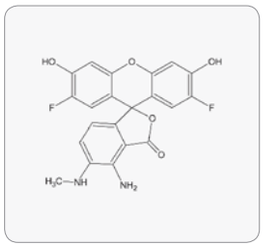
A highly fluorescent dye, useful in marking nerve cells. Can be bound to tissue by conventional aldehyde-containing biological fixatives.

Chelators and Ion Probes

A-023

DAF-FM

(DAF-FM)



$C_{21}H_{14}F_2N_2O_5$

Molecular Weight	412.34
CAS No	254109-20-1
Purity: > 90 % (HPLC)	
λex 495 nm; λem 515 nm	
Solubility: DMSO	

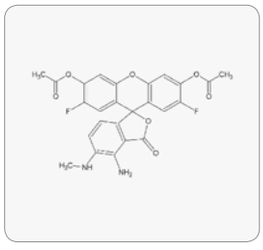
1. W.S. Kim et al.; Anal. Chem. 78(6), 1859 (2006)
2. M.M. Knight et al.; Am. J. Physiol. 284(4, Pt. 1), C1083 (2003)
3. H. Kojima et al.; Adv. Mat. 12(10), 763 (2002)
4. H. Kojima et al.; Angew. Chem. 111(21), 3419 (1999)

DAF-FM is important reagent for quantitating low concentrations of nitric oxide in solution. This compound is essentially nonfluorescent until it reacts with NO to form a fluorescent benzotrizole.

A-024

DAF-FM DA

(DAF-FM DA)



$C_{25}H_{18}F_2N_2O_7$

Molecular Weight	496.42
CAS No	254109-22-3
λex 500nm; λem 515 nm in DMSO	
Solubility: DMEM	

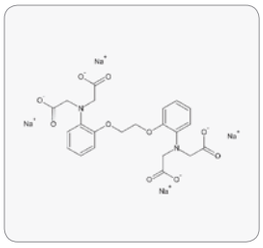
1. J. S. Carroll et al.; Anal. Chem. 79(14), 5133 (2007)
2. Y. Itoh et al.; Anal. Biochem. 287(2), 203 (2000)
3. H. Kojima et al.; Angew. Chem. 111(219), 3419 (1999)

DAF-FM diacetate is an important reagent for quantification of low concentrations of nitric oxide in solution. This compound is essentially nonfluorescent until it reacts with NO to form a fluorescent benzotriazole. With excitation/emission maxima of 495/515 nm, DAF-FM can be detected using any instrument suitable for detecting fluorescein.

A-119

1,2-bis(2-Aminophenoxy)ethane-N,N,N',N'-tetraacetic acid tetrasodium salt

(BAPTA tetrasodium salt)



$C_{22}H_{20}N_2Na_4O_{10}$

Molecular Weight	564.36
CAS No	126824-24-6
λex 254 nm; λem 363 nm	
λex 203 nm; λem 363 nm (in presence of Ca2+)	
Solubility: Water (10 mg/mL)	

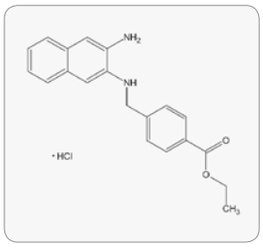
1. R. Y. Tsien; Biochem.19, 2396 (1980)

Suitable as Ca2+-indicator (fluorescence suppressed by Ca2+). Chelator with a greater selectivity for calcium compared to magnesium.

A-136

4-((3-Amino-2-naphthyl)amino-methyl)benzoic acid ethyl ester

(DAN-1 EE)



$C_{20}H_{20}N_2O_2 \cdot HCl$

Molecular Weight	356.85
CAS No	202582-07-8
λex: 370 nm; λem 435 nm	
Solubility: Ethanol, DMSO, DMF	

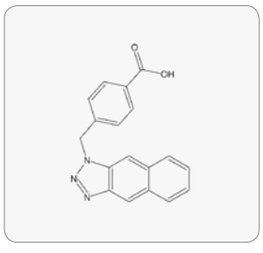
1. H. Kojima et al; Biol. Pharm. Bull. 20(12), 1229 (1997)

DAN-1 EE is a fluorescent indicator for bioimaging of nitric oxide. It is transformed to the less cell permeable DAN-1 (see A-135) by cellular enzymes.

A-151

4-((3-Amino-2-naphthyl)amino-methyl)benzoic acid triazine

(DAN-1 EE T)



$C_{18}H_{13}N_3O_2$

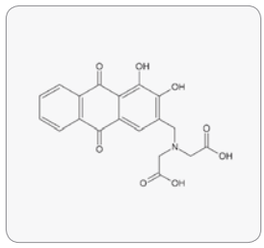
Molecular Weight	303.31
CAS No	202582-08-9
λex: 360 nm; λem 447 nm	

1. H. Kojima et al.; Biol. & Pharm. Bull. 20(12), 1229 (1997)

Reference material for transformation of DAN-1 EE (A-136).

A-208

Alizarin-3-methyliminodiacetic acid



$C_{19}H_{15}NO_8$

Molecular Weight	385.32
CAS No	3952-78-1
λex: 552 nm; λem: 629 nm (100 mM NaOH)	
Solubility: Water (5 mg/ml)	
MP: 185 °C	

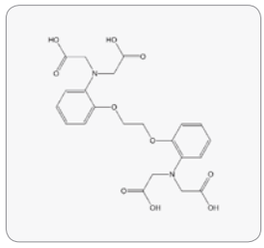
1. H. Kunkely et al.; Inorg. Chem. Comm. 10(3), 355 (2007)
2. X.R. Xu et al.; Chromatographia 59 (11/12), 745 (2004)
3. E. Palomares et al.; Adv. Funct. Mat. 14(2), 111 (2004)

This probe is used for the determination of fluorine and other anions. ATA is also a potent inhibitor of protein-nucleic acid interactions.

B-217

1,2-Bis(2-aminophenoxy)ethane-N,N,N',N'-tetraacetic acid

(BAPTA)



$C_{22}H_{24}N_2O_{10}$

Molecular Weight	476.43
CAS No	85233-19-8
λex 254 nm; λem 363 nm	
λex 203 nm; λem 363 nm (in presence of Ca2+)	
Solubility: 0.3 N Sodium Bicarbonate (50 mg/ml)	

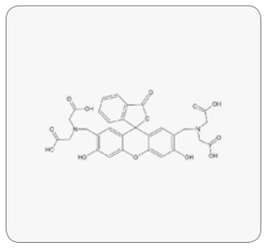
1. E. Chiancone et al.; J. Biol. Chem. 261, 16306 (1986)
2. R.Y. Tsien et al.; Biochem. 19, 2396 (1980)

Highly selective calcium chelating reagent. Suitable for the spectrophotometric monitoring of Ca2+ levels.

C-008

Calcein

(Calcein)



$C_{30}H_{26}N_2O_{13}$

Molecular Weight	622.53
CAS No	1461-15-0
λex 470 nm; λem 509 nm (PBS)	
Solubility: Water	

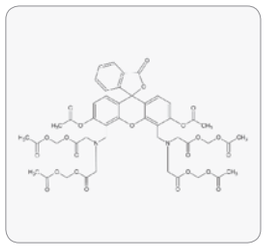
1. T. Goto et al.; Biomat. 24, 3885 (2003)
2. T. Katsu et al.; Biol. Pharm. Bull. 22, 978 (1999)
3. K.A Matsoukas et al.; The Analyst 113(2), 251 (1988)
4. V.C.K. Chiu et al.; Biophys. J. 18, 3 (1977)
5. J.F. Dandrowski et al.; Clin. Chem. 18, 1411 (1972)
6. T.Y. Toribara et al.; Talanta 7, 248 (1961)
7. D.F.H. Wallach et al.; Anal. Chem. 31, 456 (1959)

Calcein is used for determination of Ca in biological systems. Indicator for the fluorimetric determination of calcium in presence of Mg by complexometric titration.

C-009

Calcein AM Solution

(Calcein-AM)



$C_{46}H_{46}N_2O_{23}$

Molecular Weight	994.86
CAS No	148504-34-1
λex 496 nm; λem 516 nm (0.1 M Tris pH 8.0, Esterase, Ca2+)	
Solubility: DMSO	

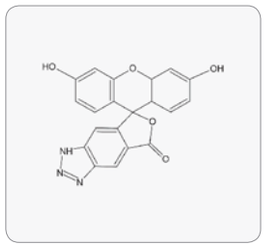
1. J. Uggeri et al.; Histochem. Cell. Biol. 122(5), 499 (2004)
2. E. Plantin-Carrenard et al.; J. Fluorescence 10(2), 167 (2000)
3. M. Essodaïgui et al.; Biochemistry 37, 2243 (1998)
4. C.M. DeGendt et al.; Clin. Chim. Acta 249(1), 189 (1996)

Calcein-AM appears to best satisfy the criteria for assaying cell adhesion and to have the least effect on cell viability and cell functions.

D-044

DAF-2T

(DAF-2T)



$C_{20}H_{11}N_3O_5$

Molecular Weight	373.32
CAS No	208850-35-5
λex 495 nm; λem 515 nm	
Solubility: DMSO	

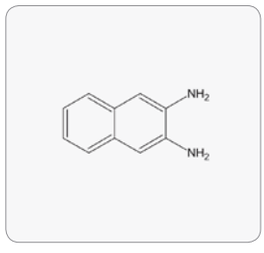
1. M. Feelisch et al;, Free Radical Biol. Med. 38(3), 356 (2005)
2. T. Nagano et al.; J. Biol. Chem. 277(1), 47 (2002)
3. T. Nagano et al.; FEBS Letters 427(2), 263 (1998)
4. H. Kojima et al.; Chem. Pharm. Bull. 46(2), 373 (1998)

Reference material for D-084 (DAF-2; see D-084)

D-062

2,3-Diaminonaphthalene

(DAN)



$C_{10}H_{10}N_2$

Molecular Weight	158.20
CAS No	771-97-1
λex 364 nm; λem 406 nm (0.5 M Na carbonate pH 10.0, after derivatization with NaNO2 in 0.1 M HCl)	
Solubility: DMSO, DMF, Pyridine	
MP: 197-203 °C	

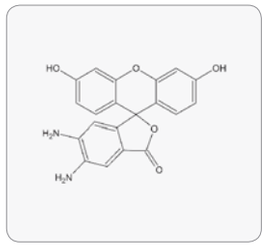
1. J. Pedro et al.; Anal. Chim. Acta 516(1-2), 229 (2004)
2. T. Nagano et al.; Biol. Pharm. Bull. 21(12), 1247 (1998)
3. W.C. Hawkes et al.; Anal. Biochem. 241(2), 206 (1996)
4. R.F. Bayfield et al.; Anal. Biochem. 144(2), 569 (1995)
5. P. Damiani et al.; Talanta 33(8), 649 (1986)

2,3-Diaminonaphtaline (DAN) is used as a derivatisation-reagent for the determination of selenium at low detection limits.

D-084

4,5-Diaminofluorescein

(DAF-2)



$C_{20}H_{14}N_2O_5$

Molecular Weight	362.34
CAS No	205391-01-1
λex 505 nm; λem 518 nm (0.1 M Tris pH 8.0)	
Solubility: DMSO	

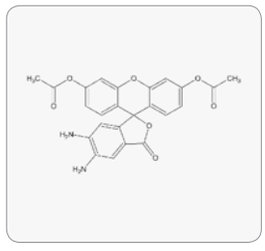
1. M. Kirsch et al.; J. Pineal Res. 40(1), 10 (2006)
2. V.M. Dirsch et al.; Biol. Proc. Online 5(1), 136 (2003)
3. N. Nagata et al.; J. Biochem. 125(4), 658 (1999)
4. H. Kojima et al.; Chem. Pharm. Bull. 46, 373 (1998)
5. H. Kojima et al.; Anal. Chem. 70, 2446 (1998)

DAF-2 is highly sensitive reagent for NO detection and determination of nitric oxide synthase activity.

D-085

5,6-Diaminofluorescein diacetat

(DAF-2 DA)



$C_{24}H_{18}N_2O_7$

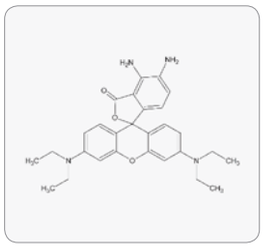
Molecular Weight	446.41
CAS No	205391-02-2
λex 491 nm; λem 513 nm	
Solubility: DMSO	

1. V.M. Dirsch et al.; Biol. Proc. Online 5(1), 136 (2003)
2. N. Nagata et al.; J. Biochem. 125(4), 658 (1999)
3. H. Kojima et al.; Anal. Chem. 70(13), 2446 (1998)
4. H. Kojima et al.; Chem. Pharm. Bull. 46, 373 (1998)
5. H. Kojima et al.; Neuroreport 9, 3345 (1998)

Highly sensitive probe for the real time detection of NO in vivo, cell permeable.

D-101

DAR-1
(DAR-1)



$C_{28}H_{32}N_4O_3$

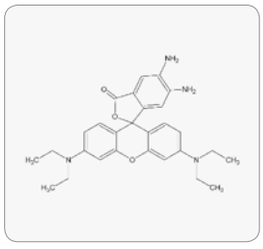
Molecular Weight	472.58
CAS No	261351-43-3
λex 566 nm; λem 586 nm (0.1 M Phosphate pH 7.4, NO)	

1. H. Kojima et al.; Analyti. Chem. 73(9), 1967 (2001)
2. H. Kojima et al.; Tetr. Lett. 41(1), 69 (2000)

Sensitive NO probe, LOD of 10 nM, shows higher photostability than the classical fluorescein derivative DAF.

D-102

DAR-2
(DAR-2)



$C_{28}H_{32}N_4O_3$

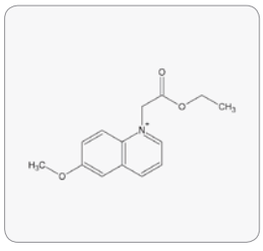
Molecular Weight	472.58
CAS No	261351-45-5
λex 562 nm; λem 579 nm (0.1 M Phosphate pH 7.4, NO)	

1. H. Kojima et al.; Analyt. Chem. 73(9), 1967 (2001)
2. H. Kojima et al.; Tetr. Lett. 41, 69 (2000)

Sensitive NO probe, LOD of 10 nM, shows higher photostability than the classical fluorescein derivative DAF.

E-001

1-(Ethoxycarbonylmethyl)-6-methoxyquinolinum bromide
(MQAE)



$C_{14}H_{16}NO_3Br$

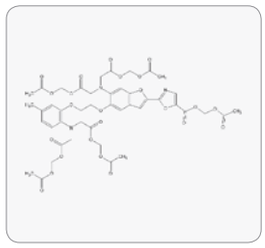
Molecular Weight	326.19
CAS No	162558-52-3
λex 350 nm; λem 460m (0.1 M Borate pH 8.0, quenching with Cl-)	
Solubility: Water, Methanol, DMSO	
MP: 177-179 °C (lit.)	

1. H. Miyazaka et al.; Am. J. Phys. 292(5, Pt. 2), F1411 (2007)
2. C. Andersson et al.; Microscopy Res. Tech. 59(6), 531 (2002)
3. A.S. Verkman et al.; Anal. Biochem. 178, 355 (1989)

Improved chloride probe. Used to measure chloride transport in liposome membranes.

F-014

Fura-2-AM
(FURA-2-AM)



$C_{44}H_{47}N_3O_{24}$

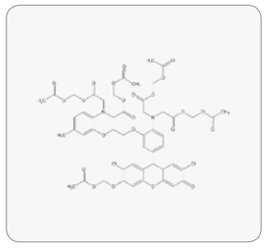
Molecular Weight	1001.85
CAS No	108964-32-5
λex 355 nm; λem 495 nm (0.1 M Tris pH 8.0, Esterase, 10 mM Ca2+)	
Solubility: DMSO	

1. W.F. Goldman et al.; Cell Calcium 11, 221 (1990)
2. M. Shelanski et al.; Enzymol. 139, 824 (1987)
3. M. Poenie et al.; R.Y. Tsien; Nature 315, 147 (1985)
4. G. Grynkiewicz et al.; J. Biol. Chem. 260, 3440 (1985)
5. W. Almers et al.; FEBS Lett. 192,13 (1985)

Membrane-permeable analog of Fura 2 with high selectivity for Ca2+ binding. Fura 2-AM can be delivered into cells by microinjection or using Influx pinocytic cell-loading reagent. After crossing the membrane, the product is quickly metabolized by cytoplasmic esterases to the membrane impermeant Fura 2.

F-033

Fluo-3-AM
(Fluo-3 AM)



$C_{51}H_{50}Cl_2N_2O_{23}$

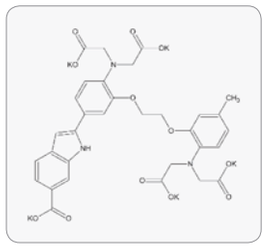
Molecular Weight	1129.85
CAS No	121714-22-5
λex 506 nm; λem 526 nm (0.1 M Tris pH 8.0, Esterase, 30 mM Ca2+)	
Solubility: DMSO	

1. T. Toyofuku et al.; Geochem., Geophys., Geosyst. 9(5) (2008)
2. D.M. Plank et al.; Meth. Cell Sc. 25(3-4), 123 (2004)
3. P. Vandenberghe et al.; J. Immun.Meth. 127, 197 (1990)
4. J.P.Y. Kao et al.; J. Biol. Chem. 264, 8179 (1989)

Ca2+-indicator fluo-3 for use with visible-light excitation sources in flow cytometry and confocal laser-scanning microscopy.

I-018

Indo-1, pentapotassium salt
(Indo-1, pentapotassium salt)



$C_{32}H_{26}K_5N_3O_{12}$

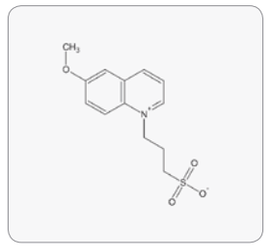
Molecular Weight	840.05
CAS No	96314-96-4
λex 330 nm; λem 398 nm (0.1 M Tris pH 8.0, 10 mM Ca2+)	
Solubility: Water	

1. A. Nelemans et al.; Meth. Molec. Biology 312, 47 (2005)
2. C.S. Owen et al; Cell Calcium 9(3), 141 (1988)
3. A.P. Jackson et al.; FEBS Letters 216(1), 35 (1987)
4. G. Grinkiewicz et al.; J. Biol. Chem. 260, 3440 (1985)

Fluorescent calcium chelator and indicator with an unusually large shift in fluorescence emission from 480 nm to 400 nm on binding of calcium. Useful for intracellular application.

M-051

6-Methoxy-N-(3-sulfopropyl) quinolinium, inner salt
(SPQ)



$C_{13}H_{15}NO_4S$

Molecular Weight	281.33
CAS No	83907-40-8
λex 344 nm; λem 443 nm	
Solubility: Water, DMSO	

1. L. Soldate et al.; Biochem. Biophys. Res. Comm. 269(2), 470 (2000)
2. N.A. Garcia et al.; Kidney International 55, 321 (1999)
3. S.P. Srinivas et al.; Am. J. Physiol. 272, C1405 (1997)
4. R. A. Bialecki et al.; Am. J. Physiol. 264, C27 (1993)
5. A.S. Verkman et al.; Anal. Biochem. 178, 355 (1989)
6. O.S. Wolfbeis et al.; Z. Anal. Chem. 314, 577 (1983)

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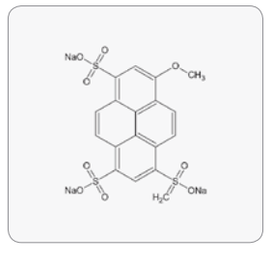
M-055

8-Methoxypyrene-1,3,6-trisulfonic acid, trisodium salt
(MPTS)



$C_{17}H_9Na_3O_{10}S_3$

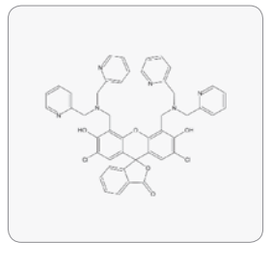
Molecular Weight	538.41
CAS No	82962-86-5
λex 404 nm; λem 431 nm (H2O)	
Solubility: Water, Methanol, DMSO, DMF	

1. D.B. Cordes et al.; Org. Biomol. Chem., 3, 1708 (2005)
2. S. Marhold et al.; Fresenius J. Anal. Chem. 336, 111 (1990)

Highly water soluble superpolar fluorescent probe for assaying cationic surfactants. It has also been used in combination with a boronic acid-modified viologen quencher to sense glucose at pH 7.4 in buffered aqueous solution.

Z-001

Zinpyr-1
(Zinpyr-1)



$C_{46}H_{36}Cl_2N_8O_5$

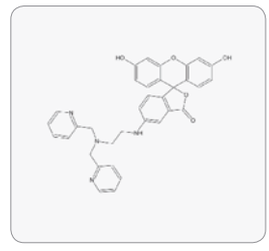
Molecular Weight	823.72
CAS No	288574-78-7
λex 492 nm; λem 527 nm (PBS, Zn2+)	
Solubility: DMSO	

1. S.A. Sinclair et al.; New Phytologist 174(1), 39 (2007)
2. M. Malavolta et al.; Cytometry, Part A 69A(10), 1043 (2006)
3. C.C. Woodproof et al.; Chemistry & Biology 11(12), 1659 (2004)
4. G.K. Walkup et al; JACS 122, 5644 (2000)

Suitable for the fluorometric detection of Zn2+

Z-005

ZnAF-1
(ZnAF-1 5-Iso)



$C_{34}H_{28}N_4O_5$

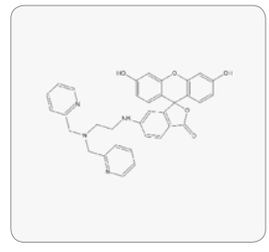
Molecular Weight	572.61
CAS No	321859-09-0
λex 492 nm; λem 514 nm (PBS, Zn2+)	
Solubility: DMSO	

1. T. Hirano et al.; J. Am. Chem. Soc. 124, 6555 (2002)
2. T. Hirano et al.; J. Am. Chem. Soc. 122, 12399 (2000)

A membrane-impermeable ethylenediaminofluoresceinyl compound that acts as a high-affinity Zn2+-specific fluorescent probe.

Z-006

ZnAF-2
(ZnAF-2 6-Iso)



$C_{34}H_{28}N_4O_5$

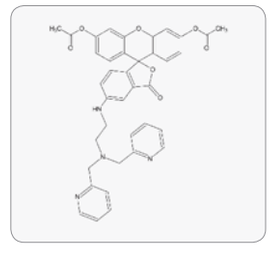
Molecular Weight	572.61
CAS No	321859-11-4
λex 492 nm; λem 515 nm (PBS, Zn2+)	
Solubility: DMSO	

1. T. Hirano et al; J. Am. Chem. Soc. 124, 6555 (2002)
2. T. Hirano et al.; J. Am. Chem. Soc. 122, 12399 (2000)

A membrane-impermeable ethylenediaminofluoresceinyl compound that acts as a high-affinity Zn2+-specific fluorescent probe (Kd = 2.7 nM). It shows low basal fluorescence and the fluorescence intensity increases ~51-fold upon stoichiometric (1:1) binding to Zn2+. Exhibits little affinity towards Ca2+, Mg2+, Na+, or K+.

Z-007

ZnAF-1 DA
(ZnAF-1 DA)



$C_{38}H_{32}N_4O_7$

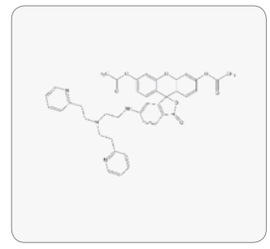
Molecular Weight	656.68
CAS No	na
λex 492 nm; λem 515 in PBS, Zn2+ (after esterase hydrolysis)	
Solubility: DMSO	

1. S. Ueno, et al.; J. Cell Biol. 158, 215 (2002)
2. T. Hirano, et al.; JACS 124, 6555 (2002)

Suitable for the fluorimetric detection of Zn2+ (after esterase hydrolysis).

Z-008

ZnAF-2 DA
(ZnAF-2 DA)



$C_{38}H_{32}N_4O_7$

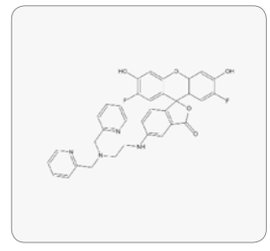
Molecular Weight	656.68
CAS No	357339-96-9
λex 492 nm; λem 515 nm (PBS, Zn2+, Esterase)	
Solubility: DMSO	

1. S. Ueno et al.; J. Cell Biol. 158, 215 (2002)
2. T. Hirano, et al.; J. Am. Chem. Soc. 124, 6555 (2002)

Suitable for the fluorimetric detection of Zn2+ (after esterase hydrolysis).

Z-009

ZnAF-1F
(ZnAF-1F)



$C_{34}H_{26}F_2N_4O_5$

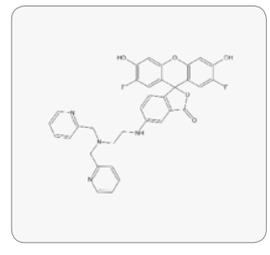
Molecular Weight	608.59
CAS No	443302-08-7
λex 492 nm; λem 517 nm (PBS, Zn2+)	
Solubility: DMSO	

1. T. Hirano et al., J. Am. Chem. Soc. 124(23), 6555 (2002)

The Zn2+ complexes of ZnAF-1F emit stable fluorescence under neutral and slightly acidic conditions because the pKa values are shifted to 4.9 by substitution of electron-withdrawing fluorine at the ortho position of the phenolic hydroxyl group.

Z-010

ZnAF-2F
(ZnAF-2F)



$C_{34}H_{26}F_2N_4O_5$

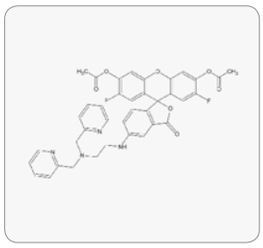
Molecular Weight	608.59
CAS No	443302-09-8
λex 492 nm; λem 517 nm (PBS, Zn2+)	
Solubility: DMSO	

1. T. Hirano et al.; J. Am. Chem. Soc. 124(23), 6555 (2002)

The Zn2+ complexes of ZnAF-2F emit stable fluorescence around neutral and slightly acidic conditions because the pKa values are shifted to 4.9 by substitution of electron-withdrawing fluorine at the ortho position of the phenolic hydroxyl group.

Z-011

ZnAF-1F DA
(ZnAF-1F DA)



$C_{38}H_{30}F_2N_4O_7$

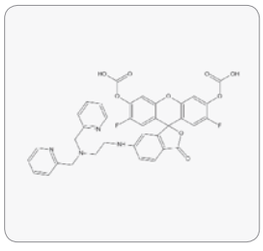
Molecular Weight	692.66
CAS No	na
≥ 95% (HPCE)	
λex 492 nm; λem 514 nm (PBS, Zn2+, Esterase)	
Solubility: DMSO	

1. S. Ueno et al.; J. Cell Biol. 158, 215 (2002)
2. T. Hirano et al.; J. Am. Chem. Soc. 124(23), 6555 (2002)

ZnAF-1F DA can permeate through the cell membrane, and is hydrolyzed by esterase in the cytosol to yield ZnAF-1F, which is retained in the cells.

Z-012

ZnAF-2F DA
(ZnAF-2F DA)



$C_{38}H_{30}F_2N_4O_7$

Molecular Weight	692.66
CAS No	443302-10-1
≥ 95% (HPCE)	
λex 492 nm; λem 515 nm (PBS, Zn2+, Esterase)	
Solubility: DMSO	

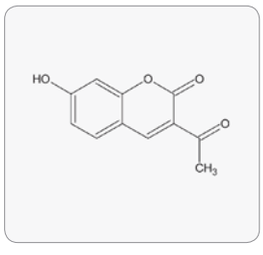
1. S. Ueno et al.; J. Cell Biol. 158, 215 (2002)
2. T. Hirano et al.; J. Am. Chem. Soc. 124(23), 6555 (2002)

ZnAF-2F DA can permeate through the cell membrane, and is hydrolyzed by esterase in the cytosol to yield ZnAF-2F, which is retained in the cells.

pH Indicators

A-003

3-Acetyl-7-hydroxycoumarin
(3-Acetyl-umbelliferone)



$C_{11}H_8O_4$

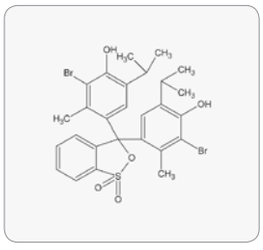
Molecular Weight	204.18
CAS No	10441-27-7
λex 370 nm; λem 455 nm (0.1 M Tris)	
Solubility: Methanol, DMSO, DMF	
MP: 234 °C (lit.)	

1. J. R. Fry et al.; Xenobiotica, 34(8), 707 (2004)
2. O.S. Wolfbeis et al.; Monatsh. Chemie 109(4), 899 (1978)
3. W.R. Sherman et al.; Anal. Chem. 40(4), 803 (1968)
4. R.H. Goodwin et al.; Arch. Biochem. 27, 152 (1950)

These lipoid indicators are also probes for phase transitions in lipid membranes and may register the detailed chemical structure of the polar head-group region or the packing density in lamellar lipid layers.

B-049

Bromothymol Blue
(Bromthymol blue)



$C_{27}H_{28}Br_2O_5S$

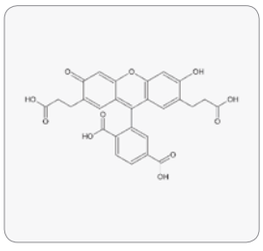
Molecular Weight	624.38
CAS No	76-59-5
λex 620 nm	
Solubility: Water	
MP: 200-202 °C	

1. D.G. Pijanowska et al.; Sensors 6(4), 428 (2006)
2. G.P. Gorbenko et al.; Biochim. Biophys. Acta, Biomemb. 1370(1), 107 (1998)
3. E.A.O. Irokanulo et al.; British J. Biomed. Sc. 51(2), 100 (1994)

Bromothymol blue is a chemical indicator for weak acids and bases.

C-002

2',7'-bis(2-Carboxyethyl)-5(6)-carboxyfluorescein
(BCECF)



$C_{27}H_{20}O_{11}$

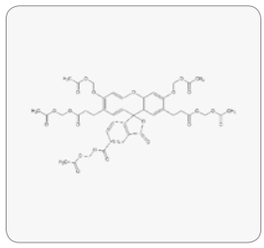
Molecular Weight	520.44
CAS No	85138-49-4
λex 482 nm; λem 520 nm (0.1 M Tris pH 7.0)	
Solubility: DMSO (0.8 mg/ml), Acetonitrile (2 mg/ml)	

1. M. Weinlich et al.; Photochem Photobiol 70, 813 (1998)
2. M.O. Bevensee et al.; J. Neurosc. Meth. 58(1), 61 (1995)
3. H. Miyata et al.; Biochem. Biophys. Res. Comm. 163(1), 500 (1989)
4. S. Kongsamut et al.; Biochim. Biophys. Acta 940(2), 241 (1988)
5. M.A. Kolber et al.; J. Immunol. Meth. 108(1-2), 255 (1988)

This fluorescent indicator is useful for pH measurements in intercellular spaces of epithelial cell monolayers, interstitial spaces of normal and neoplastic tissue and isolated cell fractions. Reliable measure of in vitro cellular cytotoxicity.

C-003

BCECF-AM
(BCECF-AM)



$C_{39}H_{38}O_{19}$

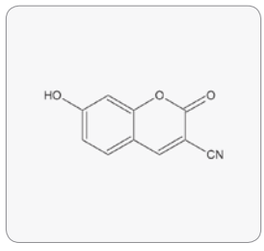
Molecular Weight	808.69
CAS No	117464-70-7
λex 482 nm; λemm528 nm (0.1 M Tris pH 8.0)	
Solubility: DMSO, DMF, Acetonitrile	

1. Urano et al.; Chem. Lett. 12, 1217 (1997)
2. W. Obexer et al; Tropical Med. Parasit. 46(1), 45 (1995)
3. A.K. Ho et al.; Am. J. Physiol. 261, C642 (1991)

Cell-permeable ester of BCECF that, on hydrolysis by cytosolic esterases, yields the intracellularly trapped pH-indicator BCECF. Allows simultaneous recording of cell volume changes and intracellular pH in single osteosarcoma cells.

C-007

3-Cyanoumbelliferone
(3-Cyanoumbelliferone)



$C_{10}H_5NO_3$

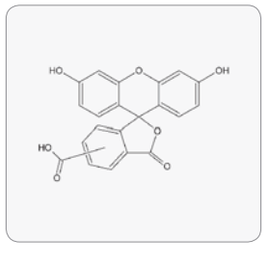
Molecular Weight	187.15
CAS No	19088-73-4
λex 408 nm; λem 450 nm (Methanol)	
Solubility: Alcohols, DMF	
MP: ≥250°C (lit.)	

1. I.N. White et al.; Anal. Biochem. 172(2), 304 (1988)

Hydroxy- and amino-substituted coumarins have been the most widely used fluorophores for preparing fluorogenic substrates. Coumarin-based substrates produce highly soluble, intensively blue-fluorescent products.

C-045

5(6)-Carboxyfluorescein
(5(6)-FAM)



$C_{21}H_{12}O_7$

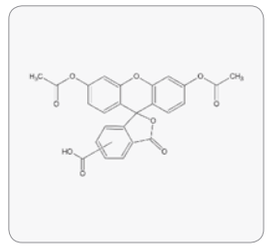
Molecular Weight	376.32
CAS No	72088-94-9
λex 492 nm; λem 517 nm (0.1 M Tris pH 8.0)	
Solubility: Aqueous Buffers (pH ≥ 5), DMSO	
MP: 275 °C	

1. M. Bradley et al.; Bioorg. Med. Chem. Lett. 18(1), 313 (2008)
2. K. Hashizaki et al.; Chem. Pharm. Bull. 54(1), 80 (2006)
3. M.L. Graber et al.; Anal. Biochem. 156, 202 (1986)
4. D.F. Babcock et al.; J. Biol. Chem. 258, 6380 (1983)

A popular probe of determination of intracellular pH.

C-046

5(6)-Carboxyfluorescein diacetate
(5(6)-FAM DA)



$C_{25}H_{16}O_9$

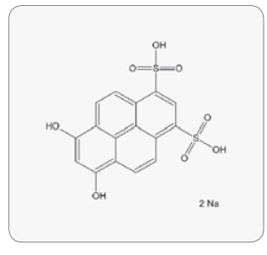
Molecular Weight	460.39
CAS No	124387-19-5
λex 492 nm; λem 517 nm (0.1 M Tris pH 8.0, Esterase)	
Solubility: DMSO	

1. C. Thrane et al.; J. Microbiol.l Meth. 28(1), 35 (1997)
2. G. Liminga et al.; Anti-Cancer Drugs 6(4), 578 (1995)
3. L.S. DeClerck et al.; J. Immun. Meth. 172(1), 115 (1994)

CFDA is a popular, sensitive, fluorescent substrate for measuring esterase activity in live cells. It is often used in cell viability assays and "Live-Dead" assay systems, especially automated cell viability assays. The cleavage product produced upon enzymatic or chemical hydrolysis of the acetate group(s) is carboxyfluorescein which is well-retained inside live cells, while the substrate CFDA is membrane permeant.

D-078

6,8-Dihydroxy-1,3-pyrenedisulfonic acid disodium salt
(DHPDS)



$C_{16}H_8Na_2O_8S_2$

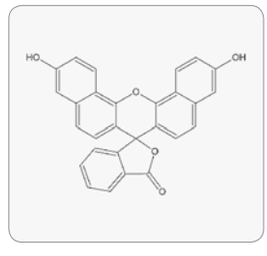
Molecular Weight	438.34
CAS No	61255-63-8
λex 405 nm; λem 456 nm (0.1 M Citrate pH 3.0)	
λex 458 nm; λem 498 nm (0.1 M Tris pH 8.0)	
Solubility: Water, DMF	
MP: ≥250 °C	

1. O.S. Wolfbeis et al.; Fresenius J. Anal. Chem. 314, 119 (1983)

Highly water soluble ratiometric pH indicator for the physiological range.

N-007

Naphthofluorescein



$C_{28}H_{16}O_5$

Molecular Weight	432.42
CAS No	61419-02-1
λex 594 nm; λem 663 nm (0.1 M Tris pH 9.0)	
Solubility: Aqueous Buffers (pH ≥ 8), DMSO, DMF	

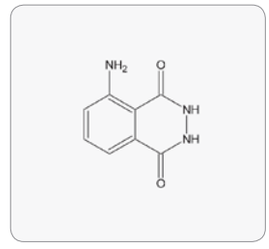
1. O.S. Wolfbeis et al.; Mikrochim. Acta 108, 133 (1992)

Naphtofluorescein is a pH-sensitive fluorescent probe, also used for preparation of labels and enzyme substrates.

Reacitve Oxygen and Nitric Oxide Probes

A-011

Luminol
(Luminol)



$C_8H_7N_3O_2$

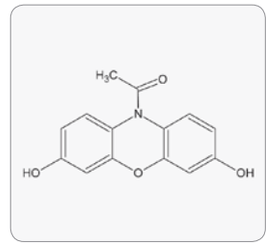
Molecular Weight	177.16
CAS No	521-31-3
Purity >98% (HPLC)	
λem 440 nm (Chemiluminescence; in 60 mM K2S2O8, 100 mM K2CO3, pH 11.5; after addition of H2O2)	
Solubility: Methanol, Ethanol, Water (slightly)	
MP: > 300°C (lit.)	

1. Y. Zhang et al.; J. Chromatogr. A. 1154, 260 (2007)
2. M.M.L. Leong et al.; Meth. Enzymol. 184, 442 (1990)
3. D.F. Roswell et al.; Meth. Enzymol. 57, 409 (1978)

Luminol is a chemiluminescent probe that has been used to detect myeloperoxidase-mediated oxidative events in granulocytes and for chemiluminescence analysis of metal cations and blood.

A-022

10-Acetyl-3,7-dihydroxyphenoxazine
(Amplex Red)



$C_{14}H_{11}NO_4$

Molecular Weight	257.24
CAS No	119171-73-2
λex 571 nm; λem 585 nm (DMSO)	
Solubility: DMSO, DMF	

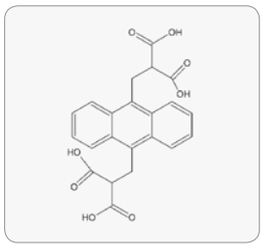
1. I. Snyrychova et al.; Phys. Plantarum, 135(1), 1-18 (2009)
2. J.G. Montay et al.; J. Immunol. Meth. 202, 133 (1997)
3. M. Zhou et al.; Anal. Biochem. 253, 162 (1997)

10-acetyl-3,7-dihydroxyphenoxazin (Amplex Red) is a non-fluorescent, highly sensitive and stable probe for H2O2. Amplex Red is an applicable fluorogenic substrate for peroxidase.

Nucleic Acid Stains

A-183

9,10-Anthracenediyl-bis(methylene) dimalonic acid



$C_{22}H_{18}O_8$

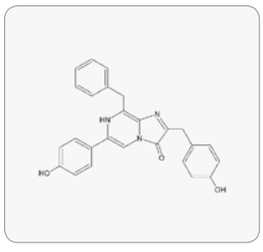
Molecular Weight	410.37
CAS No	307554-62-7
λex 380 nm; λem 407 nm (0.1 M Phosphate pH 7.0)	
Solubility: Water, DMSO	

1. N.A. Kuznetsova et al.; Russ. J. Gen. Chem. 71, 36 (2001)

Reagent for the assay of O2; it has better characteristics than 9,10-anthracenediyl-bis-dipropionic acid.

C-185

Coelenterazine



$C_{26}H_{21}N_3O_3$

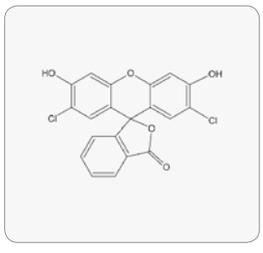
Molecular Weight	423.46
CAS No	55779-48-1
λex 400nm ; λem 514nm	
Solubility: Ethanol, Methanol	
Storage temp.: −20°C	

1. L. Rowe et al.; Anal. Chem. 80(22), 8470 (2008)
2. K.A. Cissell et al.; Anal. Bioanal. Chem. 391(7), 2577 (2008)
3. M.L.N. Dubuisson et al.; Drug Dev. Ind. Pharm. 31(9), 827 (2005)

Luminophore of the aequorin complex which is oxidized by oxygen to emit light at 465 nm when Ca2+ binds to the complex. Used for investigation of mitochondrial calcium flux.

D-004

2',7'-Dichlorofluorescein



$C_{20}H_{10}Cl_2O_5$

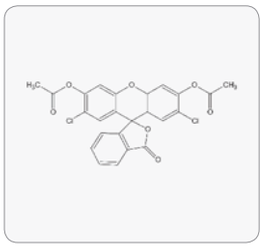
Molecular Weight	401.20
CAS No	76-54-0
λex 504 nm; λem 529 nm (0.1 M Tris pH 8.0)	
Solubility: Water (slightly), Ethanol	
MP: 280 °C	

1. T. Segawa et al.; Anal. Sci. 6, 763 (1990)
2. W.D. Pfeffer et al.; J. Chromatogr. 506, 401 (1990)
3. H. Watanabe et al.; Anal. Sci. 2, 461 (1986)
4. G. Gübitz et al.; J. Chromatogr. 117, 337 (1976)

Widely used probe, e.g. for determination of carbohydrates by fluorescence densitometry after TLC and determination of H2O2 by chemiluminescence. Fluorescent additives used in indirect fluorimetric detection in OTC-HPLC.

D-063

2',7'-Dichlorofluorescein diacetat
(DCF)



$C_{24}H_{14}Cl_2O_7$

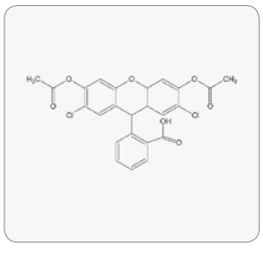
Molecular Weight	485.27
CAS No	2044-85-1
λex 504 nm; λem 524nm.1 M Tris pH 8.0, Esterase)	
Solubility: Ethanol, DMSO, DMF	
MP: 232-234 °C	

1. Z. Bozso et al.; Journal of Phytopat. 153(10), 596 (2005)
2. C. Loetchutinat et al.; Radiation Phys. Chemi.72(2-3), 323 (2004)
3. S.L. Hempel et al.; Free Radic. Biol. Med. 27, 146 (1999)
4. J. Collen et al.; J. Phycology 33(4), 643 (1997)
5. N.W. Kooy et al.; Free Radic. Biol. Med. 16, 149 (1994)

Cell permeable, sensitive indicator of peroxynitrite formation. After hydrolysis of the diacetate groups by cytosolic esterases or base-catalyzed cleavage of the diacetate groups, DCDHF is oxidized by peroxynitrite yielding the highly fluorescent product dichlorofluorescein (DCF).

D-064

2',7'-Dichlorofluorescin diacetat
(H2DCFDA)



$C_{24}H_{16}Cl_2O_7$

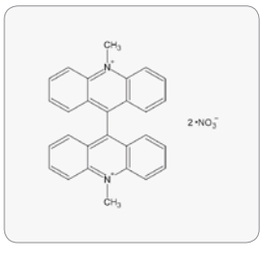
Molecular Weight	487.29
CAS No	4091-99-0
λex 504 nm; λem 529 nm (0.1 M Tris pH 8.0, Esterase, H2O2)	
Solubility: DMSO, DMF	
MP: 209-210 °C	

1. Y. Sadzuka et al.; Int. J. Pharm. 356(1-2), 300 (2008)
2. W. Jakubowski et al.; Cell Biol. Int. 24, 757 (2000)
3. A.S. Ferrer et al.; Anal. Biochem. 187, 129 (1990)

Cell-permeable fluorogenic probe used to measure reactive oxygen species (ROS) within cells by detection of enzymatically formed hydrogen peroxide.

D-068

N,N'-Dimethyl-9,9'-biacridinium dinitrate
(Lucigenin)



$C_{28}H_{22}N_4O_6$

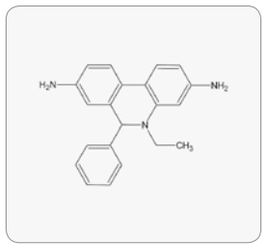
Molecular Weight	510.50
CAS No	2315-97-1
λex 550 nm; λem 369 nm	
Solubility: Water (slightly), Acetic Acid	

1. M. Kervinen et al.; Anal. Biochem. 324(1), 45 (2004)
2. M. Kanemitsu et al.; Anal. Chim. Acta 403(1-2), 125 (2000)
3. L.J. Kricka et al.; Methods Enzymol. 305, 333 (2000)
4. K. Faulkner et al.; Free Radic. Biol. Med. 15, 447 (1993)
5. A. Ingvarsson et al.; Anal. Chem. 60, 2047 (1988)
6. P. Corbisier et al.; J. Anal. Biochem. 164(1), 240 (1987)

Chemiluminescent probe for the detection of peroxides in biological systems.

D-094

Dihydroethidium
(Dihydroethidium)



$C_{21}H_{21}N_3$

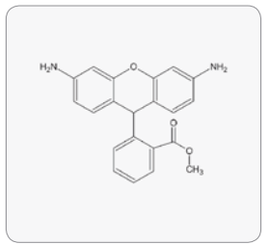
Molecular Weight	315.41
CAS No	104821-25-2
λex 392 nm; λem 410 nm (Methanol)	
Solubility: Methanol, Acetonitrile	

1. C.D. Giorgiou et al.; Nature Protocols 3(11), 1679 (2008)
2. F.R.M. Laurindo et al.; Meth. In Enzym., 441(Nitric Oxide, Part G), 237 (2008)
3. V. Bindokas et al.; J. Neurosci. 16, 1324 (1996)

Redox indicator. Blue fluorescence until oxidized to ethidium. Can be used for detecting superoxide radical in cells, tissues and organisms.

D-134

Dihydrorhodamine 123
(DHR)



$C_{21}H_{18}N_2O_3$

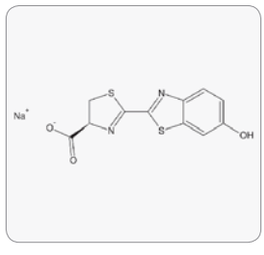
Molecular Weight	346.38
CAS No	109244-58-8
λex 500 nm; λem 525 nm (0.1 M Tris pH 8.0, after oxidizing with H2O2, peroxidase)	
Solubility: Ethanol, DMSO, DMF	

1. K. Hensley et al.; Meth. Biol. Oxidative Stress 169 (2003)
2. H. Ischiropoulos et al.; Meth. Enzymology 301, 367 (1999)
3. L.M. Henderson et al.; Europ. J. Biochem./FEBS 217(3), 973 (1993)

Dihydrorhodamine 123 is the uncharged and nonfluorescent reduction product of the mitochondrion-selective dye rhodamine 123 used for investigation of reacitve oxygen intermediates.

F-066

Firefly Luciferin sodium salt



$C_{11}H_7N_2NaO_3S_2$

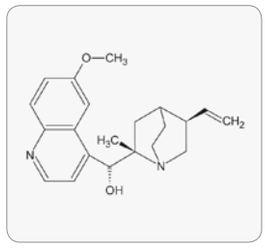
Molecular Weight	302.30
CAS No	103404-75-7
λex 327 nm; λem 537 nm (pH 4.0, λex pH dependent)	
Solubility: Water	

1. N. Smakmann et al.; J. Surg. Res. 122(2), 225 (2004)
2. P. Ronner et al.; Anal. Biochem. 275(2), 208 (1999)
3. L.J. Kricka et al.; Anal. Biochem. 175, 14 (1988)

Luciferin is used for luciferase assays and determination of ATP.

Q-012

Quinine Anhydrous, for Fluorescene



$C_{20}H_{24}N_2O_2$

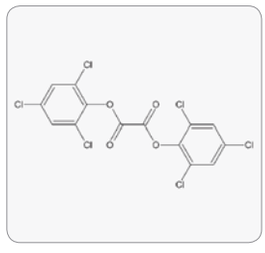
Molecular Weight	324.42
CAS No	130-95-0
λex 347 nm; λem 448 nm (0.5 M Sulfuric acid)	
Solubility: Methanol	

1. S.W. Bigger et al.; Intern. J. Chem. Kin. 32(8), 473 (2009)
2. J.E. Vitt et al.; Analyt. Chem. 69(6),1070 (1997)
3. R.F. Chen et al; Analyt. Biochem. 19(2), 374 (1967)

Because of its relatively constant and well-known fluorescence quantum yield, quinine is also used in photochemistry as a common fluorescence standard. It has been used for imaging of oxygen evolution and oxide formation. Chloride and bromide have been shown to quench fluorescence. Generally it is famous as potassium channel blocker with antipyretic (fever-reducing), antimalarial, analgesic (painkilling), and anti-inflammatory properties.

T-092

Bis(2,4,6-trichlorophenyl) oxalate
(TCPO)



$C_{14}H_4Cl_6O_4$

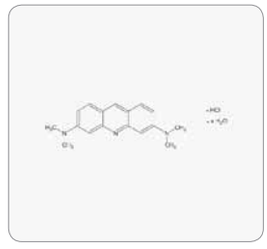
Molecular Weight	448.90
CAS No	1165-91-9
λem 430 nm (reaction of bis(2,4,6-trichlorophenyl) oxalate with 9,10-diphenylanthracene and H2O2)	

1. E. Omanovic et al.; Int. J. Environm. Anal. Chem. 85(12-13), 853 (2005)
2. M. Lin et al.; Anal. Chim. Acta 339(1-2), 131 (1997)
3. G.J. De Jong et al.; Anal. Chem. 59, 1458 (1987)
4. K. Honda et al.; Anal. Chim. Acta 177, 103 (1985)

Reagent used for the generation of peroxy-oxalate chemiluminescence with H2O2. Used for the determination of fluorescent compounds in HPLC.

A-005

Acridine orange hydrochloride
(Acridine Orange)



$C_{17}H_{19}N_3 \cdot HCl \cdot xH_2O$

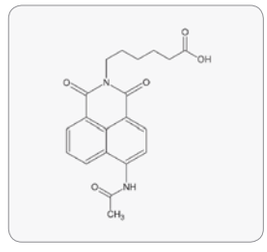
Molecular Weight	301.81
CAS No	65-61-2
λex 430 nm; λem 510 nm (Ethanol)	
λex 495 nm; λem 526 nm (bound to DNA)	
λex 460 nm; λem 650 nm (bound to RNA)	
Solubility: Water, Ethanol (moderate)	
MP: 284-287°C	

1. M.D. Lovelace et al.; J. Neurosc. Meth. 165(2), 223 (2007)
2. E. Arama et al.; Nature Protocols 1(4), 1725 (2006)
3. J. Erenpreisa et al.; Histochem. Cell Biol. 108, 67 (1997)
4. G.K. McMaster et al.; Proc. Natl. Acad. Sci. USA 74, 4835 (1977)

Acridine orange is a dye that interacts with DNA and RNA by intercelation or electrostatic attraction. This cationic dye has been used as a fluorescent stain for nucleic acids in agarose and polyacrylamide gels.

A-038

6-(4-Acetamido-1,8-naphthalamido)hexanoic acid



$C_{20}H_{20}N_2O_5$

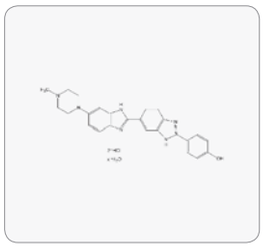
Molecular Weight	368.38
CAS No	172227-59-7
λex 364 nm; λem 476 nm (0,1 M Phosphate pH 7.0)	

1. K. Misra et al.; Radiobiol. Biomed. Res., 129 (2004)
2. R.W. Odd et al.; Blackwell Scientific Publication, 317 (1992)
3. R.J. Kaiser et al.; Nucleic Acids Research 17, 6087 (1989)

Used for the study of in situ hybridization with labeled complementary synthetic oligonucleotides (ODNs).

B-029

bisBenzimide H 33258 trihydrochloride
(Hoechst 33258)



$C_{25}H_{24}N_8O \cdot 3HCl$

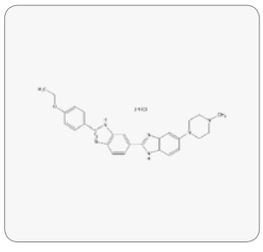
Molecular Weight	533.88
CAS No	23491-45-4
λex 355 nm; λem 465 nm (TE buffer, DNA)	
Solubility: Water	
MP: >300 °C (lit.)	

1. A. Kumar et al.; In Vitro Cell. & Developm. Biol. 44(7), 189 (2008)
2. D. Weidmann et al.; Meth. Enzym. 446, 277 (2008)
3. D. Plesca et al.; Meth. Enzym. 446, 107 (2008)
4. K.H. Elstein et al.; Exp. Cell. Res. 211, 322 (1994)
5. Y.-J. Kim et al.; Anal. Biochem. 174, 168 (1988)
6. C. Labarca et al.; Anal. Biochem. 102, 344 (1980)
7. S.A. Latt et al.; J. Histochem. Cytochem. 24, 24 (1976)

Useful for staining DNA, chromosomes and nuclei. The nucleic acid binds to the minor groove of DNA at AT-rich sequences. This dye is commonly used for determining the DNA content of viable cells without detergent treatment or fixation and for fluorescence microscopy or flow cytometry.

B-030

bisBenzimide H 33342 trihydrochloride
(Hoechst 33342)



$C_{27}H_{28}N_6O \cdot 3HCl \cdot xH_2O$

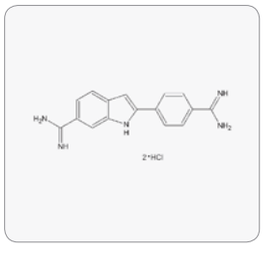
Molecular Weight	561.93
CAS No	23491-52-3
λex 355 nm; λem 465 nm (TE buffer)	
Solubility: Water (50 mg/ml)	

1. D.J. Pierce et al.; Exp. Hematol. 35(9), 1437 (2007)
2. M.E. Lalande et al.; Proc. Natl. Acad. Sci. USA 78, 363 (1981)
3. M.J. Lydon et al.; J. Cell. Physiol. 102, 175 (1980)

Useful for staining DNA, chromosomes and nuclei. May be used for fluorescence microscopy or flow cytometry. Suitable for vital DNA staining of a variety of cell types and as a probe of membrane permeability in mammalian cells.

D-025

4',6-Diamidino-2-phenylindole dihydrochloride
(DAPI)



$C_{16}H_{15}N_5 \cdot 2HCl$

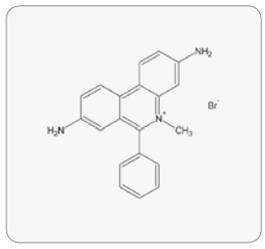
Molecular Weight	350.25
CAS No	28718-90-3
λex 340 nm; λem 488 nm (nur DAPI)	
λex 364 nm; λem 454 nm (DAPI-DNA-complex)	
Solubility: Water (25 mg/ml), DMF	

1. N.M. Ocarino et al.; Biocell 32(2), 175 (2008)
2. E.N. Zaitsev et al.; Nucleic Acids Res. 26, 650 (1998)
3. J.A. Collins et al.; J. Histochem. Cytochem. 45, 923 (1997)
4. J. Kapuscinski et al.; Biotech. Histochem. 70, 220 (1995)
5. F.J. Otto et al.; Methods Cell Biol. 41, 211 (1994)
6. C.C. Uphoff et al.; J. Immunol. Methods 149, 43 (1992)
7. P. Naimski et al.; Anal. Biochem. 106, 471 (1980)

DAPI is used for photofootprinting of DNA, to detect annealed probes in blotting applications by specifically visualizing the double-stranded complex and as a cell permeable fluorescent minor groove-binding probe for DNA. For staining DNA in agarose gels DAPI is several times more sensitive than ethidium bromide.

D-065

Dimidium bromide
(Dimidium bromide)



$C_{20}H_{18}BrN_3$

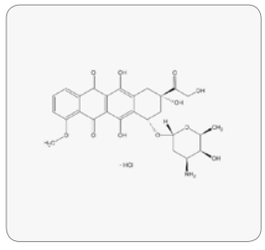
Molecular Weight	380.28
CAS No	518-67-2
λex 306 nm; λem 612 nm (50 mM Tris pH 8.0, DNA)	
Solubility: Water (slightly)	
MP: 243-248 °C	

1. E. Orthgiess et al.; Tenside, Surf., Deterg. 27(4), 226 (1990)
2. O. Dougherty et al.; Int. J. Biochem. 14, 493 (1982)

Intercalating probe for nucleic acids. Other applications include the determination of cationic surfactants.

D-257

Doxorubicin hydrochloride
(Adriamycin hydrochloride)



$C_{27}H_{29}NO_{11} \cdot HCl$

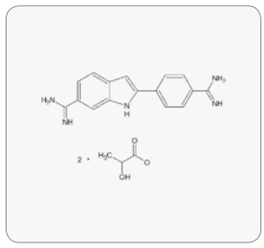
Molecular Weight	579.98
CAS No	25316-40-9
λex 470 nm; λem 585 nm (Ethanol)	
Solubility: Water (10 mg/ml), DMSO, Ethanol, Methanol	
MP: 216 °C	

1. L. Kraus-Berthier et al.; Clin. Cancer Res. 6, 297 (2000)
2. C.N. Ellis et al.; Biochem. J. 245, 309 (1987)
3. R.J. White et al.; Drugs Pharm. Sci. 22, 569 (1984)
4. A. Vigevani et al.; Anal. Profiles Drug Subst. 9, 245 (1980)

Strong fluorescent dye intercalating into DNA. Antitumour antibiotic. Effect of adriamycin on heart mitochondrial DNA. Inhibitor of reverse transcriptase and RNA polymerase; immunosuppressive agent.

D-291

DAPI Dilactate
(DAPI Dilactate)



$C_{22}H_{27}N_5O_6$

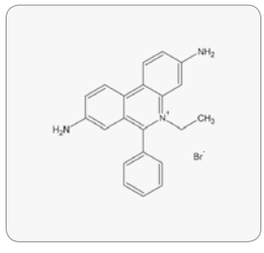
Molecular Weight	457.48
CAS No	na
λex 359 nm; λem 457 nm	
Solubility: Water (20 mg/ml)	

1. Y. Yamaguchi et al.; J. Biol. Chem., 283(25), 17020 (2008)
2. K. Windmill et al.; J. Mol. Histol. 38(1), 97 (2007)
3. G. Muehlinghaus et al.; Blood 105(10), 3965 (2005)
4. J. Tas et al.; J. Histochem. Cytochem. 29, 929 (1981)

A high sensitivity dye used to detect single nucleic acid molecules.

E-005

Ethidiumbromide
(EtBr)



$C_{21}H_{20}N_3Br$

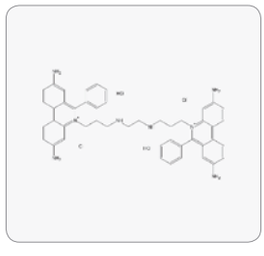
Molecular Weight	394.31
CAS No	1239-45-8
λex 530 nm; λem 600 nm (50 mM Phosphate buffer pH 7.0, upon binding to DNA)	
Solubility: Water (10 mg/ml, opaque)	
MP: 260-262 °C	

1. J. Dolezel et al.; Nature Protocols 2(9), 2233 (2007)
2. A. Severini et al.; Anal. Biochem. 193, 83 (1991)
3. P.V. Scaria et al.; J. Biol. Chem. 266, 5417 (1991)
4. J. Sambrook et al.; J. Mol. Cloning: A Lab. Manual Cold Spring Harbor 6, 6 (1989)
5. G. Lunn et al.; Anal. Biochem. 162, 453 (1987)
6. S.P. Moore et al.; Anal. Biochem. 144, 15 (1985)
7. W. Warring et al.; Antibiotics III, 141 (1975)

Intercalating agent and fluorescent label for DNA.

E-012

Ethidium Homodimer
(EthD-1, EtDi)



$C_{46}H_{50}Cl_4N_8$

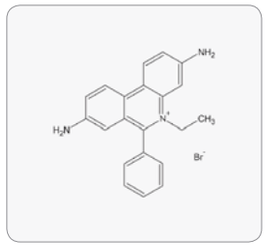
Molecular Weight	856.75
CAS No	61926-22-5
λex 528 nm; λem 617nm (TE buffer, DANN)	
Solubility: Water, DMSO, DMF	
MP: ≥250 °C	

1. A.C. Barti et al.; J. Biol. Chem. 279(7), 6065 (2004)
2. E.M. Talavera et al.; Applied Spectr. 57(2), 208 (2003)
3. E. Tuite et al.; Bioorg. Med. Chem. 3, 701 (1995)
4. J. Markovits et al; Anal. Biochem. 94, 259 (1979)

Staining dye for ssDNA, dsDNA, RNA, oligonucleotides, and triplex DNA. It does not cross intact cell membranes and can be used to test cell viability. Reagent for the fluorimetric detection of nucleic acids.

E-057

Ethidium bromide solution



$C_{21}H_{20}N_3Br$

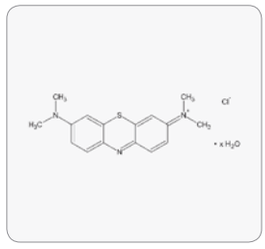
Molecular Weight	394.31
CAS No	1239-45-8
λex 530 nm; λem 600 nm (50 mM Phosphate buffer pH 7.0, upon binding to DNA)	
Solubility: Water (10 mg/ml, opaque)	
MP: 260-262 °C	

1. J. Dolezel et al.; Nature Protocols 2(9), 2233 (2007)
2. A. Severini et al.; Anal. Biochem. 193, 83 (1991)
3. P.V. Scaria et al.; J. Biol. Chem. 266, 5417 (1991)
4. J. Sambrook et al.; J. Mol. Cloning: A Lab. Manual Cold Spring Harbor 6, 6 (1989)
5. G. Lunn et al.; Anal. Biochem. 162, 453 (1987)
6. S.P. Moore et al.; Anal. Biochem. 144, 15 (1985)
7. W. Warring et al.; Antibiotics III, 141 (1975)

Intercalating agent and fluorescent label for DNA.

M-089

Methylene Blue Hydrate



$C_{16}H_{18}ClN_3S \cdot xH_2O$

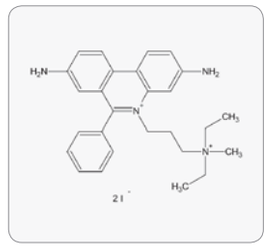
Molecular Weight	319.85
CAS No	122965-43-9
λex 664 nm; λem 682 nm	
Solubility: Water	

1. K. Painting et al.; WFCC Techn. Inf. Sheet No. 3 (2007)
2. D.P. Penny et al; Biotech. Histochem. 77(5&6), 237 (2002)
3. S. Caglio et al.; Electrophor. 14, 997 (1993)

Methylene blue is used as a dye for a number of different staining procedures, such as Wright's stain and Jenner's stain. Since it is a temporary staining technique, methylene blue can also be used to examine RNA or DNA under the microscope or in a gel. It can also be used as an indicator to determine if a cell such as yeast is alive or not.

P-023

Propidium iodide
(Propidium Iodide)



$C_{27}H_{34}I_2N_4$

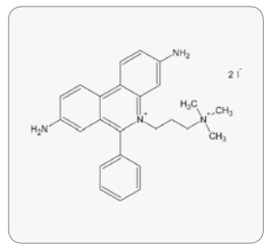
Molecular Weight	668.39
CAS No	25535-16-4
λex 530 nm; λem 620 nm (0.1 M Phosphate pH 7.0, bound to DNA)	
Solubility: Water	
MP: 220-225 °C	

1. M.K. Gould et al.; Anal. Bioche. 382(2), 87 (2008)
2. T. Kovacs et al.; Cytometry, Part A 73A(10), 965 (2008)
3. C. Foglieni et al.; Histochem. Cell Biol. 115(3), 223 (2001)
4. G. Ciancio et al.; Cytometry 14(2), 205 (1993)
5. J. Fried et al.; J. Cell Biol. 71(1), 172(1976)

Propidium iodide is the most common red-fluorescent nuclear stain. It can also be excited using excitation filters appropriate for green-fluorescent dyes.

P-117

Propidium Iodide Solution



$C_{27}H_{34}I_2N_4$

Molecular Weight	668.39
CAS No	25535-16-4
λex 530 nm; λem 620 nm (0.1 M Phosphate pH 7.0, bound to DNA)	

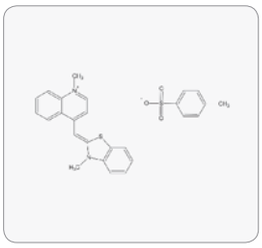
1. M.K. Gould et al.; Anal. Bioche. 382(2), 87 (2008)
2. T. Kovacs et al.; Cytometry, Part A 73A(10), 965 (2008)
3. C. Foglieni et al.; Histochem. Cell Biol. 115(3), 223 (2001)
4. G. Ciancio et al.; Cytometry 14(2), 205 (1993)
5. J. Fried et al.; J. Cell Biol. 71(1), 172(1976)

1 mg/mL in water

Lipophilic and Membrane Probes

T-013

Thiazole Orange
(Thiazol Orange)



$C_{26}H_{24}N_2O_3S_2$

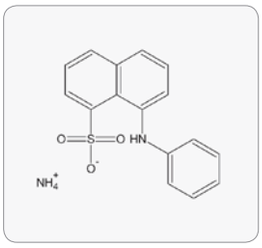
Molecular Weight	476.61
CAS No	107091-89-4
λex 509 nm; λem 530 nm (0.1 M Phosphate pH 7.0, bound to ds DNA).	
Solubility: DMSO	
MP: 270 °C	

1. T. Kubota et al.; Bull. Chem. Soc. Jap. 82(1), 110 (2009)
2. X. Fei et al.; Bioorg. & Med. Chem.17(2), 585 (2009)
3. S. Ikeda et al.; Biocon. Chem. 19(8), 1719 (2008)

Thiazol Orange is a nucleic acid stain that has found applications in many different areas. Among others it is used for reticulocyte analysis and Plasmodium species analysis as well as labeling cancer cells. Thiazole orange-labeled DANN has been used for live cell RNA imaging. Thiazole Orange has also been used for a variety of assays, PCR and flow cytometry.

A-013

8-Anilino-1-naphthalene-1-sulfonic acid ammonium salt
(ANSA)



$C_{16}H_{13}NO_3S \cdot NH_3$

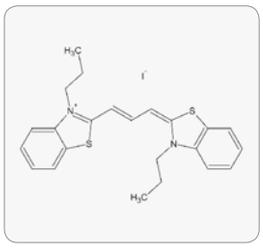
Molecular Weight	316.37
CAS No	28836-03-5
λex 388 nm; λem 470 nm (0.1 M Tris)	
Solubility: Water (50 mg/ml)	

1. M.E. Georgiou et al.; Analytical Chemistry 71(13), 2541 (1999)
2. R.A. Muesing et a.; Biochemistry 10, 2952 (1992)

Fluorescent probe used as sensitive indicator of protein folding, conformational changes and for protein studies.

D-007

3,3'-Dipropylthiacarbocyanine iodide
(DiSC(3)(3))



$C_{23}H_{25}IN_2S_2$

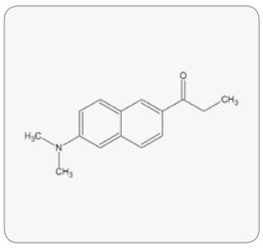
Molecular Weight	520.49
CAS No	53336-12-2
λex 556 nm; λem 575 nm (Methanol)	
Solubility: Methanol, DMSO, DMF	
MP: 288 °C	

1. D. Gaskova et al.; Biochem. Biophys. Res. Comm. 354(3), 814 (2007)
2. D. Gaskova et al.; Int. J. Biochem. Cell Biol., 34(8), 931 (2002)
3. H. Amlal et al.; M. Bichara; J. Biol. Chem. 269, 21962 (1994)
4. H.W. van Veen et al.; Biol. Chem. 269, 29509 (1994)
5. L. Hunyady et al.; Am. J. Physiol. 266, C67 (1994)

3,3'-dipropyl-thiadicarbocyanine iodide is sensitive to membrane potential, fluorescence response to depolarization depends on the staining concentration and detection method.

D-077

N,N-Dimethyl-6-propionyl-2-naphthylamine
(Prodan)



$C_{15}H_{17}NO$

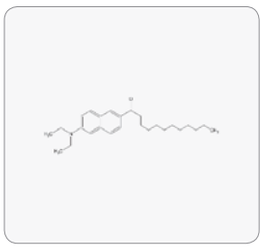
Molecular Weight	227.30
CAS No	70504-01-7
λex 361 nm; λem 498 nm (Methanol)	
Solubility: Methanol, DMF, Acetonitrile, Acetone	
MP: 137 °C	

1. B.A. Rowe et al.; J. Phys. Chem. B 110(30), 15021 (2006)
2. E. Omanovic et al.; Int. J. Environm. Anal. Chem. 85(12-13), 853 (2005)
3. M. Lin et al.; C. Huie; Anal. Chim. Acta 339(1-2), 131 (1997)
4. A. Chakrabarti et al.; Biochem. Biophys. Res. Commun. 226, 495 (1996)
5. P.L.G. Chong et al.; Biochemistry 28, 8358 (1989)
6. P.L.G. Chong et al.; Biochemistry 27, 399 (1988)

When prodan is incorporated into membranes, its fluorescence spectra are sensitive to the physical state of the surrounding phospholipids.

D-098

N,N-Dimethyl-6-dodecanoyl-2-naphthylamine
(Laurdan)



$C_{24}H_{35}NO$

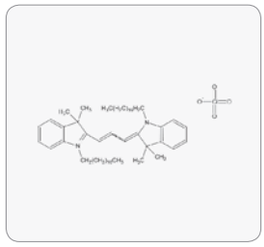
Molecular Weight	353.54
CAS No	74515-25-6
λex 366 nm; λem 497 nm (Methanol)	
Solubility: Methanol, DMF, Acetonitrile	
MP: 88 °C	

1. S.S. Antollini et al.; Meth. Mol. Biol. 400, 531 (2007)
2. Y.L. Zhang et al.; Biochem. Biophys. Res. Comm. 347(3), 838 (2006)
3. L. Bagatolli et al.; Biochimica et Biophysica Acta 1325, 80 (1997)
4. L.I. Hellgren et al.; Plant Physiol. Biochem. 34(4), 455 (1996)
5. G. Weber et al.; Biochemistry 18(14), 3075 (1979)

N,N-Dimethyl-6-dodecanoyl-2-naphthylamine (Laurdan) is used as an environmentally sensitive probe for the labeling of plasmamembranes.

D-127

1,1'-Dioctadecyl-3,3,3',3'-tetramethylindocarbocyanin perchlorate
(DilC18(3))



$C_{59}H_{97}ClN_2O_4$

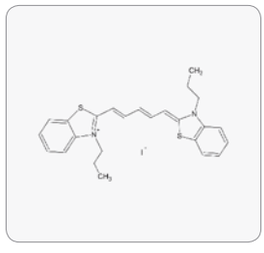
Molecular Weight	933.87
CAS No	41085-99-8
λex 550 nm; λem 565 nm (Phosphate buffer/SDS pH 7.0)	
Solubility: Methanol, DMSO, DMF	
MP: 68 °C	

1. Y. Li et al.; Nature Protocols 3(11), 1703 (2008)
2. C.K.S. Leung et al.; J. Neurosc. Meth. 168(2), 475 (2008)
3. M.F. Ethier et al.; Biochem. 22, 1178 (1983)
4. R.D. Klausner et al.; Biochem. 19, 6199 (1980)

Lipophilic carbocyanine dye used primarily for optical recordings of membrane voltage and for studies of membrane fluidity. Retrograde stain for neurons; provides intense, long-lasting staining of live neurons in vivo and in vitro.

D-130

3,3'-Dipropylthiadicarbocyanine iodide
(DiSC3(5))



$C_{25}H_{27}IN_2S_2$

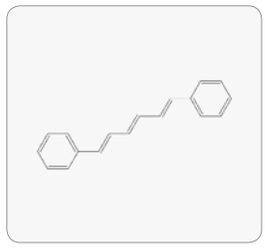
Molecular Weight	546.53
CAS No	53213-94-8
λex 500 nm; λem 705 nm (DMF)	
Solubility: DMF	
MP: 245 °C	

1. M. Kirouac et al.; J. Membr. Biol. 196(1), 51 (2003)
2. H. Suzuki et al.; Analyt. Sci. 19(9), 1239 (2003)
3. E. Farelli et al.; Analyt. Biochem. 293(2), 269 (2001)
4. M. Sip et al.; J. Photochem. Photobiol. B, Biol. 4, 321 (1990)

3,3'-Dipropylthiadicarbocyanine iodide is applied for transmembrane potential measurements.

D-264

1,6-Diphenyl-1,3,5-hexatriene
(Dicinnamyl)



$C_{18}H_{16}$

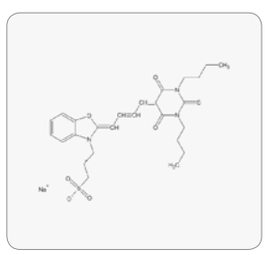
Molecular Weight	232.32
CAS No	1720-32-7
λex 350 nm; λem 428 nm (Phosphate buffer/SDS pH 7.0)	
Solubility: THF, Benzene	
MP: 199-203 °C	

1. I. Konopasek et al.; Chem. Phys. Lip. 130(2), 135 (2004)
2. M.H. Fox et al.; Cytometry 8, 20 (1987)
3. B.J. Litman et al.; Meth. Enzymol. 81, 678 (1982)

A useful fluorescence probe for membrane studies based on investigation of fluorescence depolarisation; Membrane fluidity by flow cytometry.

M-033

Merocyanin 540



$C_{26}H_{32}N_3NaO_6S_2$

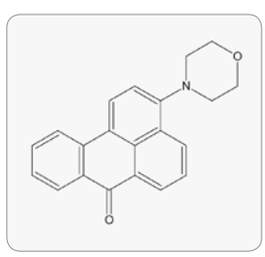
Molecular Weight	569.67
CAS No	62796-23-0
λex 555 nm; λem 578 nm (Methanol)	
Solubility: Water, DMSO, Ethanol, Methanol	
MP: 285 °C	

1. S.K. Krumova et al.; Biochim. Biophys. Acta, Biomemb. 1778(12), 2823 (2008)
2. H.A. Wilson-Ashworth et al.; Bioph. J. 91(11), 4091 (2006)
3. F. Belloc et al.; Cytometry 9, 19 (1988)
4. F. Sieber et al.; Photochem. Photobiol. 46, 1035 (1987)
5. K. Masamoto et al.; Biochim. Biophys. Acta 638, 108 (1981)
6. K.W. Kinnally et al.; Biochem. 17, 3419 (1978)
7. P.R. Dagster, W.W. Webb; Biochem. 17, 5228 (1978)

Sensitive probe for membrane potential. Selective staining of immature hemopoietic cells in flow cytometry.

M-034

3-Morpholino-benzanthrone
(ABM)



$C_{21}H_{17}NO_2$

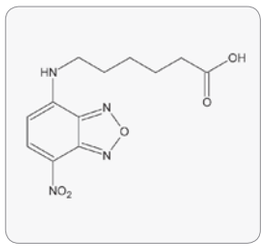
Molecular Weight	315.37
CAS No	299927-47-2
λex 439 nm; λem 632 nm (Dimethyl sulfide)	
Solubility: Ethanol	

1. E.E. Nifant'ev et al.; Russ. J. Gen. Chem. 78(3), 383 (2008)
2. E.M. Kirilova et al.; J. Fluoresc. 18(3-4), 645 (2008)
3. I. Kalnina et al.; J. Fluoresc. 9, 27 (1999)

3-morpholino-benzantrone is a new fluorescent probe for application in clinical diagnostic on studying cell menbranes and receive information on the properties of immune competent lymphocytes.

N-005

6-(7-Nitrobenzofurazan-4-ylamino)hexanoic acid
(NBD-X)



$C_{12}H_{14}N_4O_5$

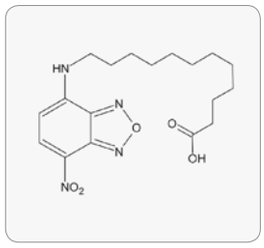
Molecular Weight	294.26
CAS No	88235-25-0
λex 466 nm; λem 535 nm (Methanol)	
Solubility: DMSO	

1. K.P. Greenough et al.; J. Phys. Chem. B 110(12), 6351 (2006)
2. H. Huan et al.; J. Biol. Chem. 277(32), 29139 (2002)
3. F. Schroeder et al.; Biochem. 34, 11919 (1995)

Fluorescent probe used for investigation of binding sites of fatty acid and sterol carrier proteins, also used for cell membrane staining.

N-013

12-(7-Nitrobenzofurazan-4-ylamino)dodecanoic acid
(NBD-dodecanoic acid)



$C_{18}H_{26}N_4O_5$

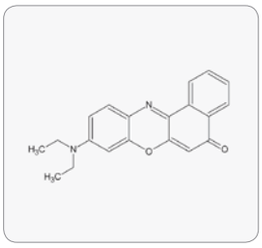
Molecular Weight	378.42
CAS No	96801-39-7
λex 466 nm; λem 530 nm (Methanol)	
Solubility: Methanol, DMF	
MP: 79-81 °C	

1. G. Muller et al.; Biochimie 85(12), 1245 (2003)
2. R. Morales et al.; Arch. Biochem. Biophys. 398(2), 221 (2002)
3. F. Schroeder et al.; Biochem. 34, 11919 (1995)

Suitable for probing the ligand binding sites of fatty acid and sterol carrier proteins as well as the investigation of lipolysis processes.

N-107

Nile Red



$C_{20}H_{18}N_2O_2$

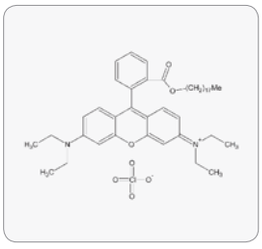
Molecular Weight	318.369
CAS No	7385-67-3
λex 485 nm; λem 525 nm (Lipid droplets)	
λex 543 nm; λem 634 nm (Methanol)	
Solubility: Methanol, Heptane, Acetone	

1. G. Diaz et al.; Micron. 39(7), 819 (2008)
2. S.D. Fowler et al.; J. Lipid Res. 28(10), 1225 (1987)
3. P. Greenspan et al.; J. Histochem. Cytochem. 33(8), 833 (1985)

Nile red is a lipophilic stain. Nile red stains intracellular lipid droplets. Nile red is also intensely fluorescent, with a strong yellow-gold emission if included into a lipid-rich environment.

O-022

Rhodamine B octadecyl ester perchlorate



$C_{46}H_{67}ClN_2O_7$

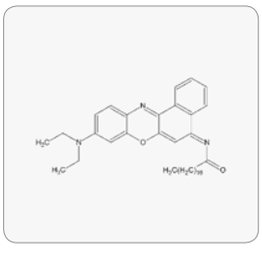
Molecular Weight	795.49
CAS No	142179-00-8
λex 554 nm; λem 575 nm (Methanol)	
Solubility: DMSO, DMF	

1. T.I. Rokitskaya et al.; J. Memb. Bio. 224(1-3), 9 (2008)
2. I. Murkovic et al.; Anal. Chim. Acta 334(1-2), 125 (1996)
3. G.J. Mohr et al.; Analyt. Chimi. Acta 316(2), 239 (1995)

As a potential sensitive membrane probe this dye has been used for potassium and nitrate sensing and other investigations of membranes.

O-027

N-Octadecanoyl-Nile blue



$C_{38}H_{53}N_3O_2$

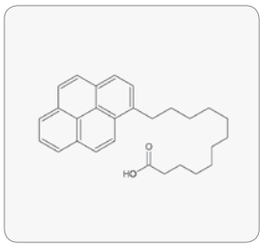
Molecular Weight	583.85
CAS No	125829-24-5
λex 614 nm; λem 663 nm (protonated)	
Solubility: Alcohols, DMSO, DMF	
MP: 91-93 °C	

1. K. Wygladacz et al.; Anal. Chim. Acta 614(1), 77 (2008)
2. W.E. Morf et al.; Anal. Chem. 62, 738 (1990)
3. K. Wang et al.; Anal. Sci. 6, 7 (1990)

This membrane probe has been used as an optode sensor for sodium and other ions. It was used to set up optical dihydrogen phosphate-selective sensors better suited for operation at physiological pH than their ion selective electrode counterparts.

P-006

12-(1-Pyrenyl)dodecanoic acid



$C_{28}H_{32}O_2$

Molecular Weight	400.55
CAS No	69168-45-2
λex 339 nm; λem 377 nm (Methanol)	
Solubility: Methanol	

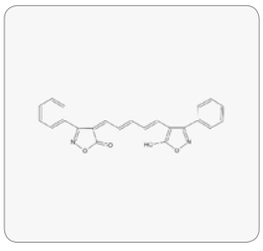
1. Y. Fujiwara et al.; Sensor Lett., 2(3,4), 232 (2004)
2. E. Fibach et al.; Cytometry 9, 525 (1988)
3. N. Nahas et al.; Biochim. Biophys. Acta 917, 86 (1987)

Anionic membrane probe used for studies on the uptake of fluorescent fatty acids into cultured cells and oxygen sensing.

P-019

1,5-Bis(3-phenyl-5-oxoisoxazol-4-yl)pentamethine oxonol

(Oxonol V)



$C_{23}H_{16}N_2O_4$

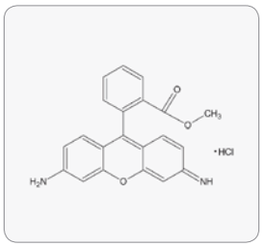
Molecular Weight	384.38
CAS No	61389-30-8
λex 610 nm; λem 640 nm (Methanol)	
Solubility: Methanol, Ethanol, DMSO, DMF, Acetonitrile	

1. A. Holoubek et al.; Biochim. Biophys. Acta, Biomembr. 1609(1), 71 (2003)
2. C.L. Bashford et al.; Biochim. Biophys. Acta 817, 174 (1985)
3. J.C. Smith et al.; Biochemist. 15, 5094 (1976)

Potential sensitive probe. Determination of plasma membrane potential of neutrophils generated by the Na+ pump.

R-011

Rhodamine 123



$C_{21}H_{17}ClN_2O_3$

Molecular Weight	380.82
CAS No	62669-70-9
λex 554 nm; λem 579 nm (Water)	
Solubility: Ethanol	

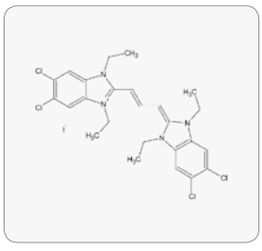
1. D. Yeheskely-Hayon et al.; FEBS J. 276(3), 637 (2009)
2. C. Wuchter et al.; Haematologica 85, 711 (2000)
3. J. Petriz et al.; Leukemia 11(7), 1124 (1997)
4. H. Minderman et al.; Cytometry 25, 14-20 (1996)
5. C. Ferlini et al.; Cytometry 21(3), 284 (1995)
6. L. Benel et al.; Bas. Appl. Histochem. 33, 71 (1989)
7. Z. Darzynkiewicz et al.; Cancer Res. 42(3), 799 (1982)

Fluorescent dye most commonly used as functional reporter in flow cytometry.

T-046

JC-1

(JC-1 jodide)



$C_{25}H_{27}Cl_4IN_4$

Molecular Weight	652.23
CAS No	3520-43-2
λex 505 nm; λem 597 nm	
Solubility: Methanol, DMSO	

1. G.Y. Guralchuk et al.; J. Phys. Chem. C 112(38), 14762 (2008)
2. S.T. Smiley et al.; Proc. Natl. Acad. Sci. 88, 3671 (1991)
3. M. Reers, et al.; Biochem. 30, 4480 (1991)

A dual-emission potential-sensitive probe that can be used to measure mitochondrial membrane potential. JC-1 is a green-fluorescent monomer at low membrane potential. At higher potentials, JC-1 forms red-fluorescent "J-aggregates," which exhibit broad excitation and very narrow emission spectra. The ratio of red to green fluorescence of JC-1 is dependent only on membrane potential, and not influenced by mitochondrial size, shape, or density.

Notes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