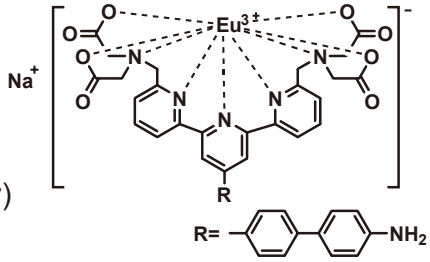
LIFE SCIENCE ANALYTICAL

Fluorescent Labeling Dyes

Europium Chelate Complex

A2083 is easily labeled to an amino group of protein etc. after conversion to DTBTA-Eu^{3+} by cyanuric chloride.

- **Red fluorescence** derived from Europium (Eu^{3+}) ($\lambda_{ex,\ max}$ = 335 nm, $\lambda_{em,\ max}$ = 616 nm)
- Long fluorescent life time (suitable for time-resolved fluorometry)
- Stable fluorescence in various aqueous buffers
- No cross talk of excitation light

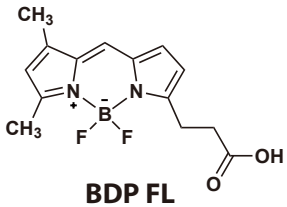


ATBTA-Eu^{3+}
10mg [A2083]

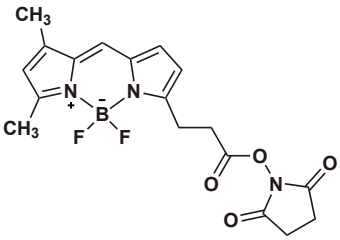
Reference T. Nishioka, J. Yuan, Y. Yamamoto, K. Sumitomo, Z. Wang, K. Hashino, C. Hosoya, K. Ikawa, G. Wang, K. Matsumoto, *Inorg. Chem.* **2006**, *45*, 4088.

Boron Dipyromethenes

D5554 and **D5555** emitting **green fluorescence** (λ_{ex} = 490 nm ($\lambda_{ex,\ max}$ = 505 nm), $\lambda_{em,\ max}$ = 513 nm) can be labeled to amino groups.



BDP FL
5mg / 25mg
[D5554]
1set(1mg×3)
[B6272]

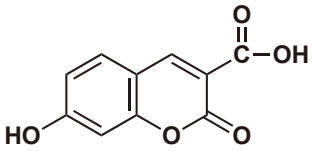


BDP FL NHS Ester
5mg / 25mg
[D5555]
1set(1mg×3)
[B6232]

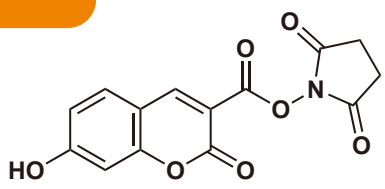
Reference K. Kitamura, H. Itoh, K. Sakurai, S. Dan, M. Inoue, *J. Am. Chem. Soc.* **2018**, *140*, 12189.

Coumarins

H1352 and **S0866** which produce **blue fluorescence** ($\lambda_{ex,\ max}$ = 342 nm, $\lambda_{em,\ max}$ = 447 nm, in pH4 buffer) can be labeled to amino groups. Fluorescent spectra depend on pH.



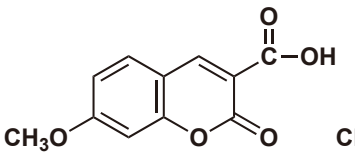
7-Hydroxycoumarin-3-carboxylic Acid
200mg / 1g [H1352]



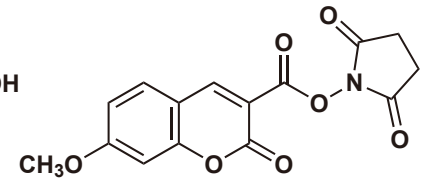
7-Hydroxycoumarin-3-carboxylic Acid *N*-Succinimidyl Ester
200mg / 1g [S0866]

References O. S. Wolfbeis, E. Koller, P. Hoghmuth, *Bull. Chem. Soc. Jpn.* **1985**, *58*, 731.
Y. C. Lee *et al.*, *J. Biol. Chem.* **2000**, *35*, 26772.

M2233 and **S0867** which produce **blue fluorescence** ($\lambda_{ex,\ max}$ = 360 nm, $\lambda_{em,\ max}$ = 410 nm, in pH7 buffer) can be labeled to amino groups. Fluorescent spectra do not depend on pH.



7-Methoxycoumarin-3-carboxylic Acid
100mg / 1g [M2233]



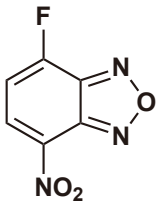
7-Methoxycoumarin-3-carboxylic Acid *N*-Succinimidyl Ester
100mg / 1g [S0867]

Reference M. Kitamatsu, M. Futami, M. Sisido, *Chem. Commun.* **2010**, *46*, 761.

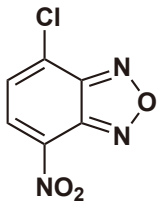
Benzofrazans

A5593, **A5592** and **A5554** emit **green-yellow fluorescence** ($\lambda_{ex,\,max}$ = *ca.* 470 nm, $\lambda_{em,\,max}$ = *ca.* 530 nm) due to nitrobenzoxadiazole (NBD) core.

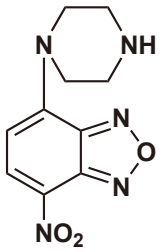
- **A5592** and **A5593** can be labeled to amino groups or thiol groups.
- **A5554** can be labeled to carboxy groups by amide bond formation using a coupling agent.



NBD-F
100mg [A5593]



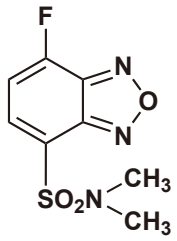
NBD-Cl
1g / 5g [A5592]



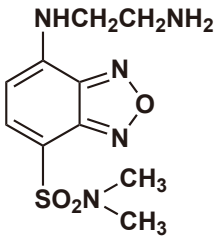
NBD-PZ
100mg [A5554]

A5595, **A5574**, **A5555** and **S0503** emit **yellow fluorescence** ($\lambda_{ex,\,max}$ = *ca.* 380 nm, $\lambda_{em,\,max}$ = *ca.* 510 nm). due to dimethylaminosulfonylbenzoxadiazole (DBD) core.

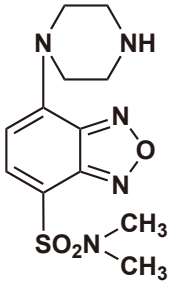
- **A5595** can be labeled to amino groups or thiol groups.
- **A5574** and **A5555** can be labeled to carboxy groups by amide bond formation using a coupling agent.
- **S0503** can be labeled to amino groups due to the active *N*-hydroxysuccinimide ester.



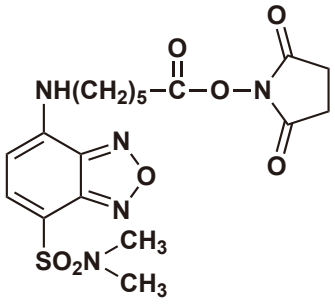
DBD-F
100mg [A5595]



DBD-ED
100mg [A5574]



DBD-PZ
100mg [A5555]



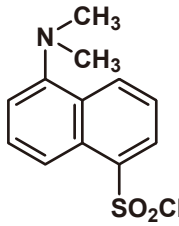
Succinimidyl 6-[[7-(*N*,*N*-Dimethylaminosulfonyl)-2,1,3-benzoxadiazol-4-yl]amino]hexanoate
100mg [S0503]

References K. Imai, *Yakugaku Zasshi (J. Pharm. Soc. Jpn.)* **2003**, *123*, 901.
S. Uchiyama, T. Santa, N. Okiyama, T. Fukushima, K. Imai, *Biomed. Chromatogr.* **2001**, *15*, 295.
T. Kurihara *et al.*, *J. Biol. Chem.* **2012**, *287*, 24113
B. Xu *et al.*, *Langmuir* **2013**, *29*, 15191

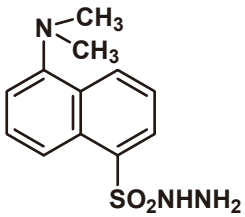
Dansyls

D0656, **A5552** and **A5354** emit **green-yellow fluorescence** ($\lambda_{ex,\,max}$ = *ca.* 335 nm, $\lambda_{em,\,max}$ = *ca.* 460 nm, dependent on the environment) due to dimethylaminonaphthalene sulfonyl (DANSYL) core.

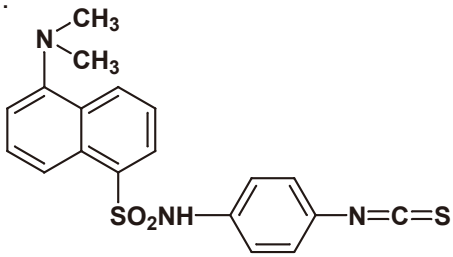
- **D0656** can be labeled to amino groups by sulfonamide bond formation.
- **A5552** can be labeled to carbonyl groups by hydrazone bond formation.
- **A5354** can be labeled to amino groups by thiourea bond formation.



Dansyl Chloride
1g / 5g / 25g [D0656]



Dansyl Hydrazine
1g / 5g [A5552]



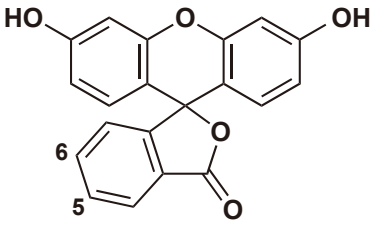
Dansylamino-PITC
100mg [A5354]

References T. Hiratsuka, *Tanpakushitsu Kakusan Koso (Protein, Nucleic Acid and Enzyme)* **1997**, *42*, 1069.
B. K.-K. Fung, L. Stryer, *Biochemistry* **1978**, *17*, 5241.
V. R. N. Munasinghe, J. E. T. Corrie, G. Kelly, S. R. Martin, *Bioconjugate Chem.* **2007**, *18*, 231.
S. Siricilla, K. Mitachi, K. Skorupinska-Tudek, E. Swiezewska, M. Kurosu, *Anal. Biochem.* **2014**, *461*, 36.

Fluoresceins

Fluoresceins emit **green fluorescence** ($\lambda_{ex,\ max}$ = 494 nm, $\lambda_{em,\ max}$ = 521 nm).

- **F0026**, **F0783** and **F0784** can be labeled to amino groups or thiol groups.[1)]
- **C2477** and **C2478** can be labeled to amino groups by amide bond formation using a coupling agent.[2)]
- **C2479** can be labeled to amino groups without a coupling agent due to the active *N*-hydroxysuccinimide ester.[3)]
- **F0810** can be labeled to thiol groups due to the maleimide group.[4)]
- **A0306** and **A0864** can be labeled to carboxy groups by amide bond formation using a coupling agent.[5)]
- **F1222** can be labeled to azido groups via click reaction.[6)]

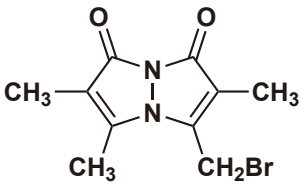


5 = -NCS	**Fluorescein 5-Isothiocyanate** (isomer I) **(=5-FITC)**	100mg / 1g [F0026]
6 = -NCS	**Fluorescein 6-Isothiocyanate** (isomer II) **(=6-FITC)**	100mg [F0783]
5or6 = -NCS	**Fluorescein Isothiocyanate** (mixture of 5- and 6- isomers)	100mg / 1g [F0784]
5 = -COOH	**5-Carboxyfluorescein Hydrate (=5-FAM)**	100mg [C2477]
6 = -COOH	**6-Carboxyfluorescein Hydrate (=6-FAM)**	100mg [C2478]
5 = -CO-NHS	**5-Carboxyfluorescein *N*-Succinimidyl Ester**	20mg / 100mg [C2479]
5 = -maleimide	**Fluorescein-5-maleimide**	25mg [F0810]
5 = -NH_2	**5-Aminofluorescein** (isomer I)	1g / 5g [A0306]
6 = -NH_2	**6-Aminofluorescein** (isomer II)	1g 24,100円 / 5g [A0864]
5 = -CONH-Alkyne	**5-FAM-Alkyne**	5mg / 25mg [F1222]

References 1) H. Rinderknecht, *Nature* **1962**, *193*, 167.
2) S. Onoue, B. Liu, Y. Nemoto, M. Hirose, T. Yajima, *Anal. Sci.* **2006**, *22*, 1531.
3) P. Breeuwer, J. Drocourt, F. M. Rombouts, T. Abee, *Appl. Environ. Microbiol.* **1996**, *62*,178.
4) T. Cihlar, E. S. Ho, *Anal. Biochem.* **2000**, *283*, 49.
5) W. B. Dandliker, A. N. Hicks, S.A. Levison, R. J. Brawn, *Biochem. Biophys. Res. Commun.* **1977**, *74*, 538.
6) W. M. Rink, F. Thomas, *Org. Lett.* **2018**, *20*, 7493.

Bimane

B4220 emits **blue fluorescence** ($\lambda_{ex,\ max}$ = 390 nm, $\lambda_{em,\ max}$ = 480 nm, only when bonding to a thiol group).
B4220 can be specifically labeled to thiol groups.

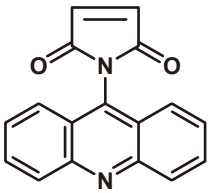


Bromobimane
20mg / 100mg
[B4220]

References N. S. Kosower, E. M. Kosower, G. L. Newton, H. M. Ranney, *Proc. Natl. Acd. Sci. USA* **1979**, *76*, 3382.
H. Yano, S. Kuroda, B. B. Buchanan, *Proteomics* **2002**, *2*, 1090.

Acridine

A5591 can be labeled to thiol groups and emits **blue fluorescence** ($\lambda_{ex,\ max}$ = 365 nm, $\lambda_{em,\ max}$ = 440 nm).

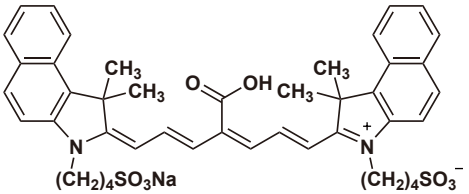


NAM
50mg / 100mg
[A5591]

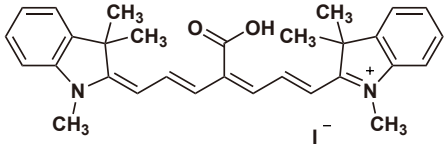
References T. Konno, T. Kamata, H. Ohrui, H. Meguro, *Anal. Sci.* **1993**, *9*, 871.
M. Hashida *et al.*, *J. Pharm. Sci.* **2012**, *101*, 3398.

Cyanines

O0574 emits **near-infrared fluorescence** ($\lambda_{ex,\ max}$ = 790 nm, $\lambda_{em,\ max}$ = 820 nm) similar to Indocianine Green (ICG).
C3693 emits **near-infrared fluorescence** ($\lambda_{ex,\ max}$ = 748 nm, $\lambda_{em,\ max}$ = 779 nm).



1g / 5g
[O0574]

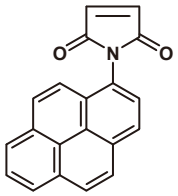


1g / 5g
[C3693]

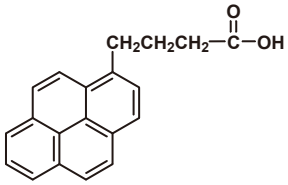
Pyrenes

Pyrenes emit **blue fluorescence** ($\lambda_{ex,\,max}$ = 342 nm, $\lambda_{em,\,max}$ = 386 nm).

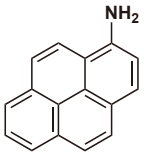
- **P1214** can be labeled to thiol groups.[1)]
- **P1213** can be labeled to amino groups by amide bond formation using a coupling agent.[2)]
- **A1632** can be labeled to carboxy groups by amide bond formation using a coupling agent.[3)]
- **E0939** and **P2226** can be labeled to azido groups via click reaction.[4)]
- **A2791** can be labeled to terminal alkynes or cyclooctynes via click reaction.[5)]



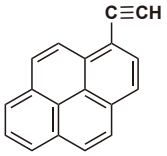
***N*-(1-Pyrenyl)-maleimide**
250mg
[P1214]



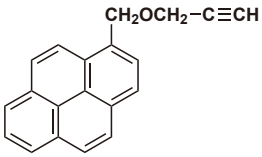
1-Pyrenebutyric Acid
1g / 5g
[P1213]



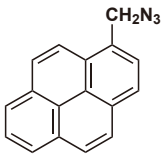
1-Aminopyrene
1g / 5g / 25g
[A0632]



1-Ethynylpyrene
200mg / 1g
[E0939]



1-[(2-Propynyloxy)methyl]pyrene
200mg / 1g
[P2226]

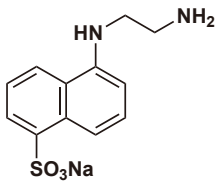


1-(Azidomethyl)pyrene
200mg / 1g
[A2791]

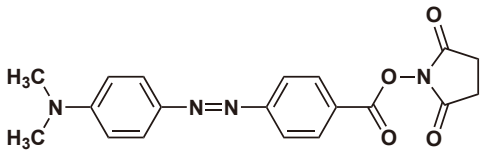
References 1) C. Wu, L. R. Yarbrough, F. Y. H. Wu, *Biochemistry* **1976**, *15*, 2863.
2) K. Yamana, M. Nakamura, *et al.*, *Bioconjugate Chem.* **2002**, *13*, 1266.
3) M. Kumar *et al.*, *Dalton Trans.* **2012**, *41*, 408.
4) P. Wessig, P. Müller, *et al.*, *Biochim. Biophys. Acta.* **2011**, *1808*, 2781.
5) Y. Xia, L. Peng, *et al.*, *J. Med. Chem.* **2012**, *55*, 5642.

Others

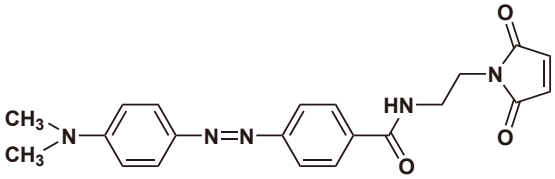
- **S0891** can be labeled to carboxy groups by amide bond formation using a coupling agent, and emits **blue fluorescence** ($\lambda_{ex,\,max}$ = 336 nm, $\lambda_{em,\,max}$ = 490 nm).
- **S0857** can bind chemically to amino groups by amide bond formation, and has been applied to the synthesis of FRET probes because working as a dark quencher for **S0891**.[1)]



1,5-EDANS
100mg
[S0891]



DABCYL *N*-Succinimidyl Ester
200mg / 1g
[S0857]



DABCYL C2 maleimide
25mg
[D5954]

References 1) G. T. Wang, E. Matayoshi, H. J. Huffaker, G. A. Krafft, *Tetrahedron Lett.* **1990**, *31*, 6493.
2) A. Pessi *et al.*, *Anal. Biochem.* **1996**, *240*, 60.

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