

Alexa Fluor[®] *Dye Selection Guide*

 **invitrogen**[™]

Molecular Probes[™]
invitrogen detection technologies

Alexa Fluor® Dye Selection Guide

This guide is designed to provide you with a concise and informative set of criteria for choosing the optimal Alexa Fluor® dye for your protein labeling application. Each page in this guide highlights a different Alexa Fluor® dye by summarizing key spectral data, excitation sources, and relevant product offerings. Full excitation and emission spectra are included for each of the dyes.

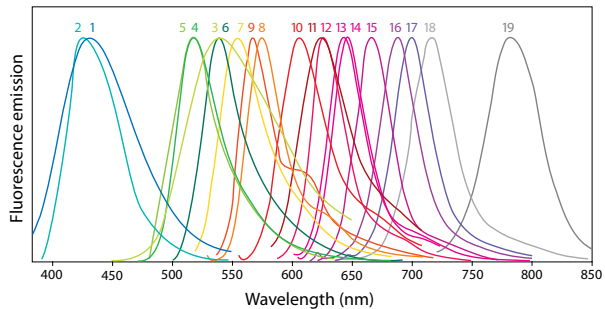
The guide is organized by dye emission “color,” with color-coded thumb slots providing quick access to the dye you need. Keep it handy, use it often, and be assured that no matter which Alexa Fluor® dyes you select, you’re using the finest, brightest, and most photostable fluorescent reagents available.

General notes about this guide

- Absorption (Abs), fluorescence excitation (Ex), and fluorescence emission (Em) maxima, in nm, are given for the indicated dye conjugated to an IgG antibody.
- Extinction coefficients (ϵ) are in units of $\text{cm}^{-1} \text{M}^{-1}$.
- Human vision is insensitive to light beyond ~ 650 nm; it is therefore not possible to view the far-red-fluorescent dyes by looking through the eyepiece of a conventional fluorescence microscope.

Emission spectra for the Alexa Fluor® dye series

The Alexa Fluor® dyes series spans the near-UV, visible, and near-IR spectra, offering unbeaten brightness, photostability, and instrument compatibility.



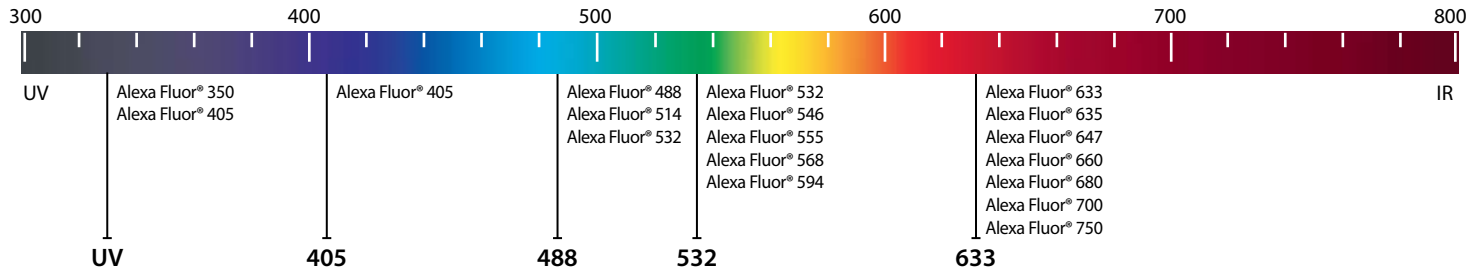
- | | |
|----------------------|----------------------|
| 1. Alexa Fluor® 350 | 11. Alexa Fluor® 594 |
| 2. Alexa Fluor® 405 | 12. Alexa Fluor® 610 |
| 3. Alexa Fluor® 430 | 13. Alexa Fluor® 633 |
| 4. Alexa Fluor® 488 | 14. Alexa Fluor® 635 |
| 5. Alexa Fluor® 500 | 15. Alexa Fluor® 647 |
| 6. Alexa Fluor® 514 | 16. Alexa Fluor® 660 |
| 7. Alexa Fluor® 532 | 17. Alexa Fluor® 680 |
| 8. Alexa Fluor® 546 | 18. Alexa Fluor® 700 |
| 9. Alexa Fluor® 555 | 19. Alexa Fluor® 750 |
| 10. Alexa Fluor® 568 | |

Notes about our reactive dyes

- **Succinimidyl esters** react with aliphatic amines to form stable amide bonds, and react with thiols in organic solvents to form thioesters. Succinimidyl esters show very low reactivity with aromatic amines, alcohols, phenols (including tyrosine), and histidine.
- **2,4,5,6-Tetrafluorophenyl (TFP) esters** are more resistant to nonspecific hydrolysis than either succinimidyl esters or sulfosuccinimidyl esters, with equal or superior amine reactivity.
- Thiols react with **maleimides** to yield thioethers. Reaction of maleimides with amines usually requires a higher pH than reaction of maleimides with thiols.
- Carboxylic acid-reactive **hydrazides** are widely used as fixable cell tracers. These highly water-soluble reactive dyes are ideal for microinjection or for use with our Influx™ pinocytic cell-loading reagent.

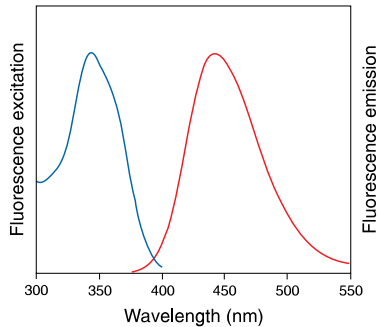
Flow cytometry laser lines

Spectral properties of the Alexa Fluor® dyes are optimally matched to common laser excitation sources.



Notes about our labeling kits

- Our **Protein Labeling Kits** provide a simple method for labeling proteins, especially IgG antibodies, with a fluorescent dye. The reactive dyes used in these kits are water soluble; no organic solvents are required. Purification is accomplished on a gravity-feed size-exclusion column, which is supplied with the kit. Labeling and purification can be completed in about two hours.
- Use our **Monoclonal Antibody Labeling Kits** to simply and efficiently label small amounts of IgG antibodies. These kits contain everything needed to perform five separate labeling reactions; no organic solvents are required, and purification is accomplished on a size-exclusion spin column optimized for use with IgG antibodies. Labeling and purification can be completed in less than two hours.
- The **Microscale Protein Labeling Kits** provide a convenient means for labeling small amounts (20–100 μg) of purified protein. These kits are optimized for labeling 12–150 kDa proteins, and contain everything needed to perform three labeling reactions and to separate the resulting conjugates from excess dye. Labeling and purification can be completed in as little as 30 minutes.



Alexa Fluor[®] 350 dye

Abs/Em maxima: 346/442 nm

Extinction coefficient: 19,000

Notes: more water soluble and typically more than 50% brighter than AMCA dyes;
compatible with ProLong[®] Gold and *Slowfade*[®] Gold antifade reagents

Spectrally similar dyes: AMCA, AMCA-X

Molecular weight: 410

Flow cytometer laser line: UV

Blue fluorescence

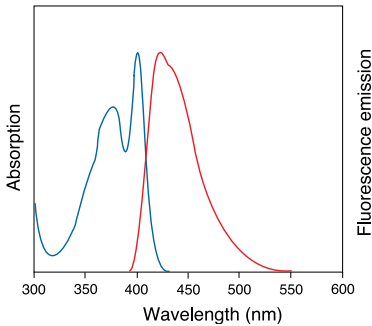
Alexa Fluor® 350 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A10168
C ₅ -maleimide	A30505
Hydrazide	A10439
C ₅ -aminooxyacetamide	A30627

Alexa Fluor® 350 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10170
Monoclonal Antibody Labeling Kit	A20180

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 405 dye

Abs/Em maxima: 401/421 nm

Extinction coefficient: 34,000

Notes: optimal spectral match to blue diode laser

Spectrally similar dyes: Pacific Blue[™] dye, Cascade Blue[®] dye

Molecular weight: 1028

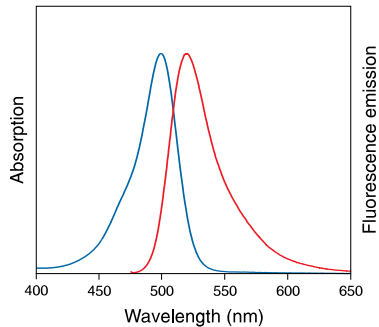
Flow cytometer laser line: 405

Blue fluorescence

Alexa Fluor[®] 405 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A30000, A30100

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 488 dye

Abs/Em maxima: 495/519 nm

Extinction coefficient: 71,000

Notes: greater photostability than fluorescein; pH insensitive spectra between pH 4 and 10; compatible with ProLong[®] Gold and *Slowfade*[®] Gold antifade reagents

Spectrally similar dyes: fluorescein (FITC), Cy2

Molecular weight: 643

Flow cytometer laser line: 488

Green fluorescence

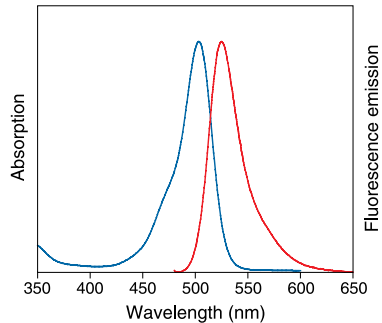
Alexa Fluor® 488 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20000, A20100
Hydrazide	A10436, A10440
C ₅ -maleimide	A10254
TFP ester	A30005

Alexa Fluor® 488 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10235
Monoclonal Antibody Labeling Kit	A20181
Microscale Protein Labeling Kit	A30006

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 500 dye

Abs/Em maxima: 502/525 nm

Extinction coefficient: 71,000

Notes: use with the Alexa Fluor[®] 514 dye for simultaneous detection via linear unmixing

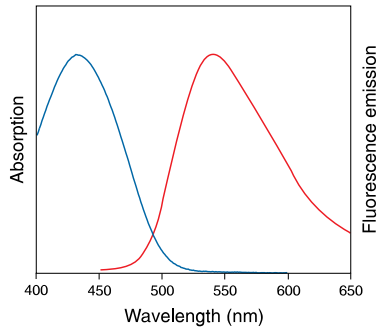
Molecular weight: 700

Flow cytometer laser line: 488

Green fluorescence

Alexa Fluor® 500 dye is currently available only as an IgG or streptavidin conjugate; reactive versions of this dye and labeling kits are under development.

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 430 dye

Abs/Em maxima: 434/541 nm

Extinction coefficient: 16,000

Notes: coumarin derivative, large Stokes shift

Molecular weight: 702

Flow cytometer laser line: 405

Yellow-green fluorescence

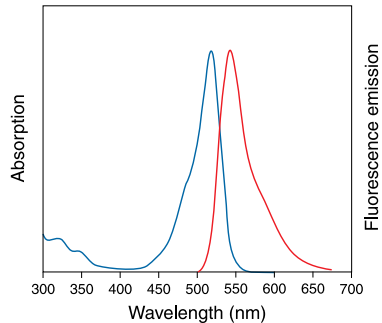
Alexa Fluor® 430 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A10169

Alexa Fluor® 430 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10171

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 514 dye

Abs/Em maxima: 517/542 nm

Extinction coefficient: 80,000

Notes: optimal match for 514 nm spectral line of argon-ion laser; use with the Alexa Fluor[®] 500 dye for simultaneous detection via linear unmixing

Molecular weight: 714

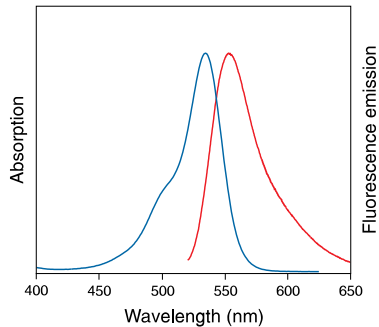
Flow cytometer laser line: 514

Yellow-green fluorescence

Alexa Fluor® 514 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A30002

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 532 dye

Abs/Em maxima: 532/554 nm

Extinction coefficient: 81,000

Notes: optimal match for Nd:YAG laser

Molecular weight: 721

Flow cytometer laser line: 532

Yellow fluorescence

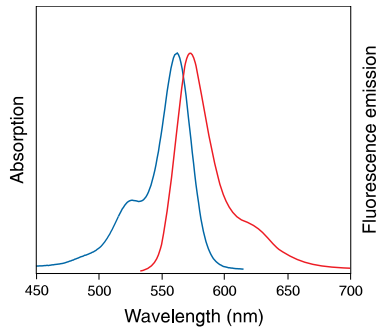
Alexa Fluor® 532 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20001, A20101MP
Hydrazide	A10436, A10440
C ₅ -maleimide	A10254
TFP ester	A30005

Alexa Fluor® 532 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10236
Monoclonal Antibody Labeling Kit	A20182

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 546 dye

Abs/Em maxima: 556/573 nm

Extinction coefficient: 104,000

Notes: strongly excited by 546 nm mercury-arc lamp emission; compatible with ProLong[®] Gold and Slowfade[®] Gold antifade reagents

Molecular weight: 1079

Flow cytometer laser line: 532

Orange fluorescence

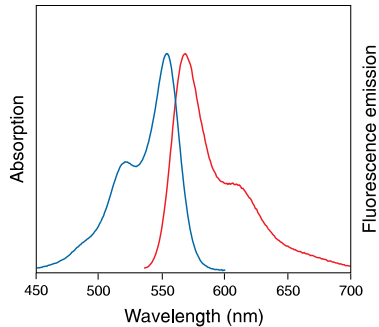
Alexa Fluor® 546 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20002, A20102
C ₅ -maleimide	A10258

Alexa Fluor® 546 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10237
Monoclonal Antibody Labeling Kit	A20183

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 555 dye

Abs/Em maxima: 555/565 nm

Extinction coefficient: 150,000

Notes: greater photostability than Cy3 dye; compatible with ProLong[®] Gold and SlowFade[®] Gold antifade reagents

Spectrally similar dyes: tetramethylrhodamine, Cy3 dye

Molecular weight: ~1250

Flow cytometer laser line: 532

Red-orange fluorescence

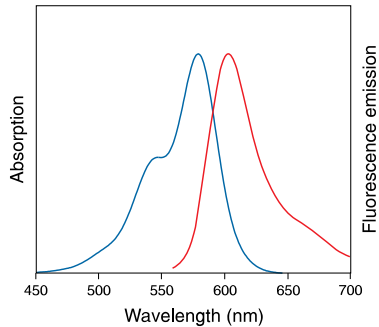
Alexa Fluor® 555 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20009, A20109
C ₂ -maleimide	A20346

Alexa Fluor® 555 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A20174
Monoclonal Antibody Labeling Kit	A20187

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 568 dye

Abs/Em maxima: 578/603 nm

Extinction coefficient: 91,300

Notes: optimal match to the 568 nm line of the Ar–Kr mixed-gas laser; compatible with ProLong[®] Gold and Slowfade[®] Gold antifade reagents

Spectrally similar dyes: Lissamine rhodamine B dye, Rhodamine Red[™] dye

Molecular weight: 792

Flow cytometer laser line: 532

Red-orange fluorescence

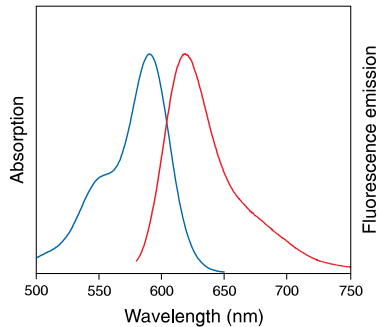
Alexa Fluor® 568 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20003, A20103
Hydrazide	A10437, A10441
C ₅ -maleimide	A20341

Alexa Fluor® 568 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10238
Monoclonal Antibody Labeling Kit	A20184

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 594 dye

Abs/Em maxima: 590/617 nm

Extinction coefficient: 90,000

Notes: compatible with ProLong[®] Gold and Slowfade[®] Gold antifade reagents

Spectrally similar dyes: Texas Red[®] dye, Cy3.5 dye

Molecular weight: 820

Flow cytometer laser line: 532

Red fluorescence

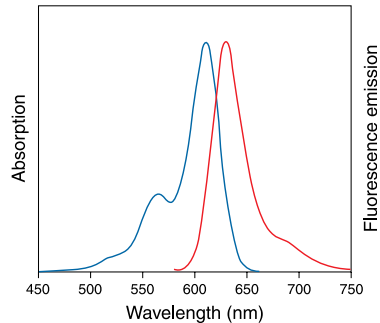
Alexa Fluor® 594 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20004, A20104
Hydrazide	A10438, A10442
C ₅ -maleimide	A10256

Alexa Fluor® 594 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A10239
Monoclonal Antibody Labeling Kit	A20185

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 610 dye

Abs/Em maxima: 612/628 nm

Extinction coefficient: 138,000

Notes: the longest-wavelength Alexa Fluor[®] dye with fluorescence that is visible to the human eye

Molecular weight: 1172

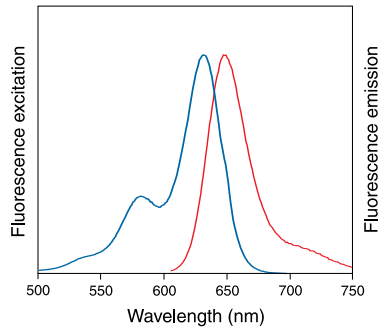
Flow cytometer laser line: 532

Red fluorescence

Alexa Fluor® 610 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A30003, A30103

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 633 dye

Abs/Em maxima: 632/647 nm

Extinction coefficient: 100,000

Notes: optimal match for He-Ne and red diode lasers; compatible with ProLong[®] Gold antifade reagent

Molecular weight: ~1200

Flow cytometer laser line: 633

Far-red fluorescence

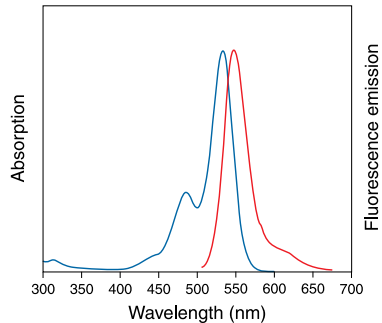
Alexa Fluor® 633 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20005, A20105
Hydrazide	A30634
C ₅ -maleimide	A20342

Alexa Fluor® 633 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A20170

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 635 dye

Abs/Em maxima: 612/628 nm

Extinction coefficient: 138,000

Notes: optimal match for He-Ne and red diode lasers; compatible with ProLong[®] Gold and Slowfade[®] Gold antifade reagents

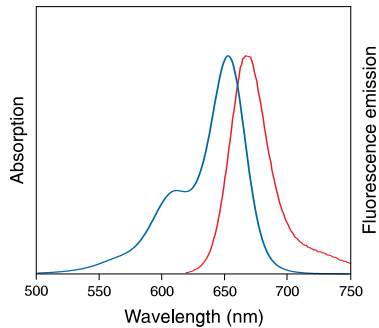
Molecular weight: 1172

Flow cytometer laser line: 633

Far-red fluorescence

Alexa Fluor® 635 dye is currently available only as an IgG, streptavidin, or phalloidin conjugate; reactive versions of this dye are currently under development.

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 647 dye

Abs/Em maxima: 650/665 nm

Extinction coefficient: 237,000

Notes: yields conjugates that are brighter than Cy5 dye conjugates; compatible with ProLong[®] Gold and *Slowfade*[®] Gold antifade reagents

Spectrally similar dyes: Cy5 dye, allophycocyanin (APC)

Molecular weight: ~1300

Flow cytometer laser line: 633

Far-red fluorescence

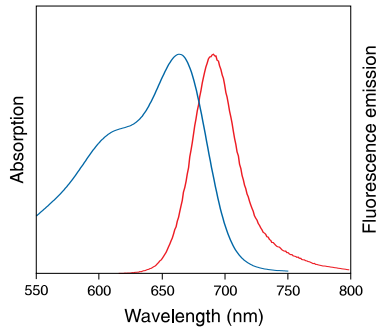
Alexa Fluor® 647 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20006, A20106
Hydrazide	A20502
C ₂ -maleimide	A20347
C ₅ -aminooxyacetamide	A30632

Alexa Fluor® 647 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A20173
Monoclonal Antibody Labeling Kit	A20186
Microscale Protein labeling Kit	A30009

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor® 660 dye

Abs/Em maxima: 663/690 nm

Extinction coefficient: 132,000

Notes: strongly excited by He-Ne laser; compatible with ProLong® Gold and Slowfade® Gold antifade reagents

Spectrally similar dyes: Cy5.5 dye, allophycocyanin (APC)

Molecular weight: ~1100

Flow cytometer laser line: 633

Near-infrared fluorescence

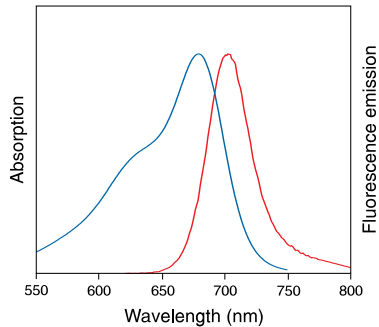
Alexa Fluor® 660 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20007, A20107
C ₂ -maleimide	A20343

Alexa Fluor® 660 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A20171

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 680 dye

Abs/Em maxima: 679/702 nm

Extinction coefficient: 184,000

Notes: compatible with ProLong[®] Gold and *Slowfade*[®] Gold antifade reagents

Spectrally similar dyes: Cy5.5 dye, allophycocyanin (APC)

Molecular weight: ~1150

Flow cytometer laser line: 633

Near-infrared fluorescence

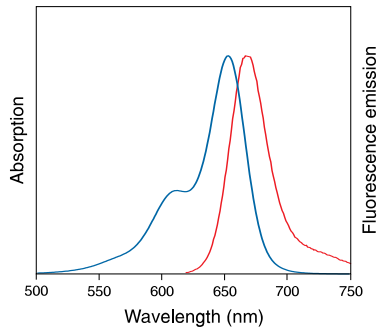
Alexa Fluor® 680 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20008, A20108
C ₂ -maleimide	A20344

Alexa Fluor® 680 Dye Labeling Kits

Labeling Kit	Cat. no.
Protein Labeling Kit	A20172

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 700 dye

Abs/Em maxima: 702/723 nm

Extinction coefficient: 192,000

Notes: strongly excited by far-red diode lasers

Molecular weight: ~1400

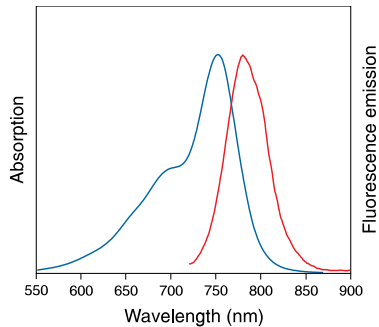
Flow cytometer laser line: 633

Near-infrared fluorescence

Alexa Fluor® 700 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20010, A20110

For current prices or to order online, please visit probes.invitrogen.com



Alexa Fluor[®] 750 dye

Abs/Em maxima: 749/775 nm

Extinction coefficient: 240,000

Notes: longest-wavelength Alexa Fluor[®] dye; matches xenon-arc lamp or dye-pumped laser excitation

Spectrally similar dyes: Cy7 dye

Molecular weight: ~1300

Flow cytometer laser line: 633

Near-infrared fluorescence

Alexa Fluor® 750 Reactive Dyes

Reactive Dye	Cat. no.
Succinimidyl ester	A20011, A20111

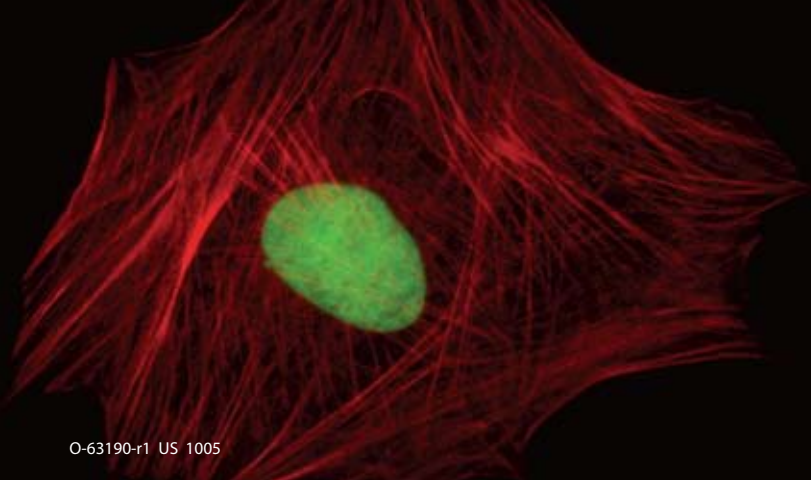
For current prices or to order online, please visit probes.invitrogen.com

Get further information about Alexa Fluor® dyes and their applications

- download the relevant Manuals and Product Inserts from our website: **probes.invitrogen.com/lit**
- consult *The Handbook—A Guide to Fluorescent Probes and Labeling Technologies*: **probes.invitrogen.com/handbook**
- contact our Technical Services department: **probetech@invitrogen.com**

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