# Dyes and Stains

**CFDA-SE**

Cell proliferation and tracking dye

Catalog # 75003

10 mg

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## Product Description

CFDA-SE (5(6)-carboxyfluorescein diacetate succinimidyl ester) is a stable, cell-permeable diacetate precursor to CFSE. Upon diffusion into the cell, intracellular esterases cleave the acetate group to generate CFSE, which interacts with cellular amines via its succinimidyl groups to generate a highly fluorescent green dye that is impermeant to the cell membrane. CFDA-SE is frequently used in cell proliferation assays, as it is partitioned approximately equally between the progeny so that cell division can be followed as a successive halving of the fluorescence intensity through multiple generational divisions. CFDA-SE is also used for motility assays and in vivo cell tracking experiments. CFDA-SE-labeled cells can be detected with any instrument/filter set compatible with fluorescein detection.

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| Chemical Name: | 3',6'-bis(acetyloxy)-3-oxo-2,5-dioxo-1-pyrrolidinyl ester-spiro[isobenzofuran-1(3H),9'-[9H]xanthene]-ar-carboxylic acid |
| Alternative Names: | 5(6)-Carboxyfluorescein succinimidyl ester; 6-{[(2,5-Dioxo-1-pyrrolidinyl)oxy]carbonyl}-3-oxo-3H-spiro[2-benzofuran-1,9'-xanthene]-3',6'-diyl diacetate; carboxyfluorescein diacetate succinimidyl ester; CFSE |
| CAS Number: | 150347-59-4 |
| Chemical Formula: | $C_{29}H_{19}NO_{11}$ |
| Molecular Weight: | 557.5 g/mol |
| Excitation Wavelength: | 492 nm (esterase-cleaved fluorescent derivative) |
| Emission Wavelength: | 517 nm (esterase-cleaved fluorescent derivative) |

## Properties

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| Storage: | Store at -20°C. |
| Shelf Life: | Product stable until expiry date (EXP) on label. Protect product from prolonged exposure to light. |
| Format/Formulation: | A crystalline solid |

Please refer to the Safety Data Sheet (SDS) for hazard information.

## Applications

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|---|---|
| Verified: | FA, FC, Fluorescence microscopy |
| Reported: | FA, FC, Fluorescence microscopy, Histochemistry, ICC, IF, In vivo cell tracking |
| Special Applications: | This product has been verified for analyzing cells isolated with EasySep™ kits, including EasySep™ Human T Cell Enrichment Kit (Catalog #19051) and EasySep™ Mouse CD11c Positive Selection Kit II (Catalog #18780), and for analyzing cultured cells, including T cells cultured in ImmunoCult™-XF T Cell Expansion Medium (Catalog #10981). |

Abbreviations: CellSep: Cell separation; ChIP: Chromatin immunoprecipitation; FA: Functional assay; FC: Flow cytometry; ICC: Immunocytochemistry; IF: Immunofluorescence microscopy; IHC: Immunohistochemistry; IP: Immunoprecipitation; RIA: Radioimmunoassay; WB: Western blotting

## Handling/Directions for Use

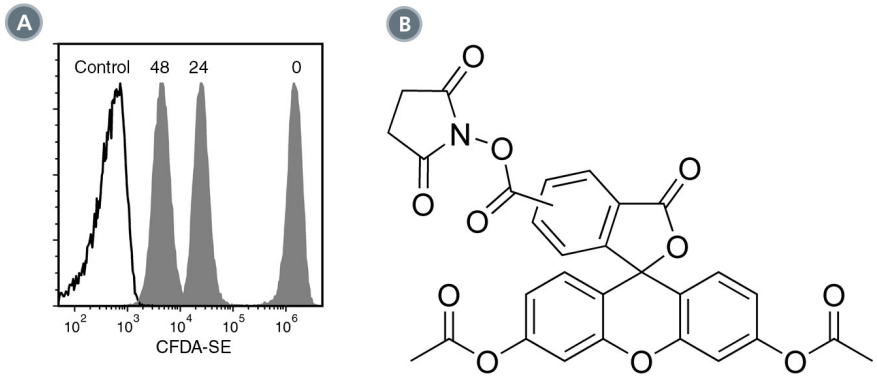
PREPARATION
A stock solution may be made by dissolving the CFDA-SE in the solvent of choice. CFDA-SE is soluble in organic solvents. Guidelines for the solubility of CFDA-SE are as follows:
· DMSO ≤ 20 mg/mL
· Dimethyl formamide ≤ 30 mg/mL
CFDA-SE is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, CFDA-SE should first be dissolved in an organic solvent and then diluted with the aqueous buffer of choice. If performing biological experiments, ensure the residual amount of organic solvent is insignificant, as organic solvents may have physiological effects at low concentrations.

Wherever possible, prepare and use the stock solutions on the same day. Protect stock solutions from prolonged exposure to light. If stock solutions must be made in advance, aliquot and store in tightly sealed vials at -20°C, protected from prolonged exposure to light. Generally these will be stable for up to 1 month.

FLOW CYTOMETRY (in vitro cell proliferation assay)
It is recommended to use CFDA-SE at a final concentration of 0.5 - 10 µM.
1. Resuspend the cells at 1 x 10^7 - 1 x 10^8 cells/mL in phosphate-buffered saline (PBS).
2. Add an equal volume of CFDA-SE as a 2X working stock to give a final concentration of 0.5 - 10 µM.
   NOTE: The dye should be titrated for optimal performance for each cell type and application.
3. Incubate cells with the dye for 5 - 10 minutes in the dark at 37°C or room temperature (15 - 25°C).
4. Add an equal volume of culture medium containing 10% fetal bovine serum (FBS) and incubate for 5 minutes to quench the staining.
5. Pellet the cells by centrifugation and wash once with an equal volume of culture medium.

Cells are now fluorescently labeled and ready to be cultured or analyzed.

## Data/Structure




(A) Flow cytometry analysis of Sp2/0 mouse myeloma cells labeled with CFDA-SE and analyzed by flow cytometry after being cultured for 0, 24, and 48 hours (filled histograms). Solid line histogram (control) shows unlabeled cells analyzed after 48 hours of cell culture.
(B) Chemical structure of CFDA-SE.

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