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DATASHEET

Hoechst 33342

Product overview

Name	Hoechst 33342
Cat No	HB0787
Description	Blue fluorescent DNA stain. Cell permeable. Nuclear stain.
Alternative names	H33342, Bisbenzimidazole H 33342
Biological action	Dyes & stains

Images

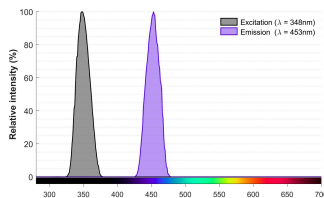


Fig 1. Peak emission spectrum of Hoechst 33342 when excited at 355nm and excitation spectrum when recording at 452nm. Hoechst 33342 is a DNA binding dye with strong affinity for nucleic acids used to label cell nuclei in fluorescence experiments. Hoechst 33342 from Hello Bio has an excitation peak at 348nm and an emission peak at 453nm. For protocol see #Protocol 1 in application notes below.



Biological Data

Biological description

Overview

Blue fluorescent DNA stain that is commonly used in fluorescent microscopy. It is frequently used as a nuclear stain to stain nuclei. It is excited by UV light.

Hoechst 33342 is cell permeable and has greater cell permeability than [Hoechst 33258](#). The stain can be used on both live and fixed cells and is often used as an alternative to [DAPI](#).

Hoechst 33342 binds to the AT-rich regions of the minor groove in DNA which renders it specific for nuclear chromatin. Its fluorescent intensity depends on the DNA content, chromatin structure and the position of the cell within the cell cycle.

Uses and applications

There is little fluorescent overlap with other commonly used small-molecule fluorophores / fluorescent proteins that emit in the green / red range. This makes it suitable for a wide range of applications.

Counterstain

Hoechst 33342 is commonly used as a counterstain in fluorescent imaging.

Hoechst 33342 can stain the condensed nuclei of apoptotic cells to allow the identification of chromatin condensation and fragmentation. It is commonly used with **propidium iodide** to distinguish normal/live apoptotic and dead cell populations [5]. It can additionally be used in conjunction with **arcidine orange** (AO) to distinguish apoptotic cells.

Incorporation of **BrdU** into DNA has a quenching effect on Hoechst fluorescence. Hoechst 33342 is also used in combination with BrdU to monitor cell cycle progression.

Stem cells

Combination of the Hoechst 33342 stain with surface-marker phenotyping allows the characterisation of a sub-population of stem cells termed the 'side population' (SP).

Application notes

#Protocol 1: Measurement of excitation and emission spectra of Hoechst 33342

- Hoechst 33342 was prepared at 100pg/ml in PBS.
- Excitation and emission spectra were measured between 280nm and 850nm using a Tecan Infinite M200 PRO ELISA plate reader.

Solubility & Handling

Storage instructions Solubility overview Important

-20 °C

Soluble in water, and in DMSO

This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use.

Chemical Data

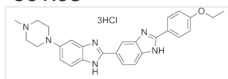
Chemical name

2-(4-ethoxyphenyl)-6-[6-(4-methylpiperazin-1-yl)-1H-benzimidazol-2-yl]-1H-benzimidazole

Molecular Weight

561.93

Chemical structure



Molecular Formula

C₂₇H₂₈N₆O₃·3HCl

CAS Number

875756-97-1

PubChem identifier

1464

SMILES

CCOC1=CC=C(C=C1)C2=NC3=C(N2)C=C(C=C3)C4=NC5=C(N4)C=C(C=C5)N6CCN(CC6)C

InChi

InChI=1S/C27H28N6O/c1-3-34-21-8-4-18(5-9-21)26-28-22-10-6-19(16-24(22)30-26)27-29-23-11-7-20(17-25(23)31-27)33-14-12-32(2)13-15-33/h4-11,16-17H,3,12-15H2,1-2H3,(H,28,30)(H,29,31)

InChiKey

PRDFBSVERLRRMY-UHFFFAOYSA-N

MDL number

MFCD00012678

References

Labeling nuclear DNA with hoechst 33342.

Chazotte B (2011) Cold Spring Harb Protoc 2011(1)

PubMedID

[21205857](#)

Hoechst 33342 stain and u.v. laser exposure do not induce genotoxic effects in flow-sorted boar spermatozoa.

Parrilla I *et al* (2004) Reproduction 128(5)

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[15509707](#)

Phototoxicity of Hoechst 33342 in time-lapse fluorescence microscopy.

Purschke M *et al* (2010) Photochem Photobiol Sci 9(12)

PubMedID

[20931137](#)
