

## Hoechst 33342, blue fluorescent nucleic acid stain

<http://www.lumiprobe.com/p/hoechst-33342>

Hoechst 33342 (bisbenzimidazole, HOE 33342) is a cell-permeant blue-emitting fluorescent dye that binds strongly to adenine-thymine-rich regions in the minor groove of double-stranded DNA. Although Hoechst 33342 can bind to all nucleic acids, AT-rich dsDNA strands enhance its fluorescence considerably.

Hoechst 33342 bound with DNA has excitation/emission maxima at 351/461 nm, respectively. The fluorescence intensity of Hoechst 33342 increases with the pH of the solvent. The unbound dye fluoresces in the 510–540 nm range. The green fluorescence of unbound dye may be observed when an excessive dye concentration is used or the sample is insufficiently washed out. The dye has a considerable Stokes shift between the excitation and emission spectrum, making it worthwhile in multicolor labeling experiments.

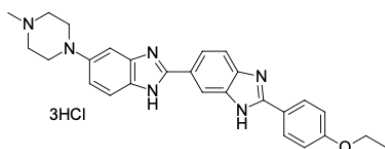
The additional ethyl group in Hoechst 33342 renders it more cell-permeant than [DAPI](#) and other Hoechst dyes. Hoechst 33342 exhibits a 10-fold greater cell permeability than Hoechst 33258. Hoechst 33342 is also less toxic than DAPI, which ensures a higher viability of stained cells.

Hoechst 33342 is used extensively in fluorescence microscopy and flow cytometry for staining chromosomes and nuclei in live and fixed cells. The dye is often used to distinguish condensed pycnotic nuclei in apoptotic cells and cell sorting.

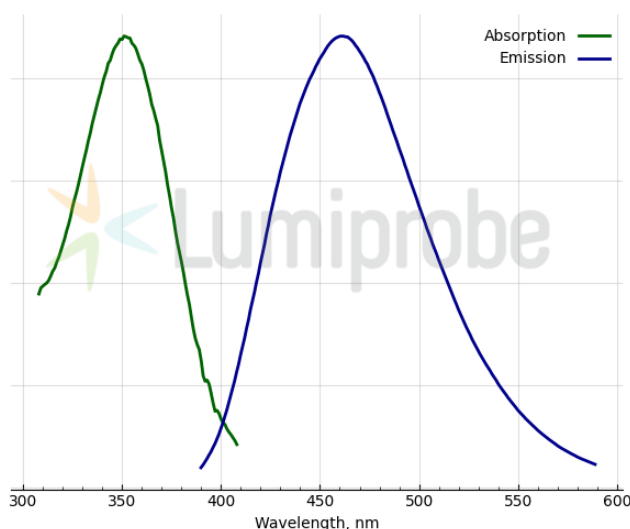
Hoechst 33342 is quenched by [bromodeoxyuridine \(BrdU\)](#), commonly used to detect dividing cells. When BrdU is integrated into DNA, the bromine is supposed to deform the minor groove so that Hoechst dyes cannot reach their optimal binding site. This property of Hoechst 33342 is used to study cell-cycle progression.

The commonly used dye concentration to stain bacteria or eukaryote cells is 0.1–10 µg/mL.

We offer Hoechst 33342 as a powder (1H010), a concentrated 10 mg/mL (2G010), and a ready-to-use ([1B410](#)) aqueous solutions.



**Structure of Hoechst 33342**



**Absorption and emission spectra of Hoechst 33342 (DNA-dye complex)**

### General properties

Appearance:	yellow to brown-green solid, yellow to brown-green solution
Molecular weight:	561.95
CAS number:	23491-52-3
Molecular formula:	C <sub>27</sub> H <sub>31</sub> Cl <sub>3</sub> N <sub>6</sub> O
IUPAC name:	2'-(4-Ethoxyphenyl)-5-(4-methyl-1-piperazinyl)-2,5'-bi-1H-benzimidazole trihydrochloride
Solubility:	water, DMSO, DMF

Quality control: NMR <sup>1</sup>H and HPLC-MS (95+%)

Storage conditions: 24 months after receipt at -20°C in the dark. Transportation: at room temperature for up to 3 weeks. Desiccate.

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**Spectral properties**

Excitation/absorption maximum, nm: 351 (complex)

Emission maximum, nm: 461 (complex)