# PRODUCT INFORMATION

## Gemcitabine

*Item No. 11690*

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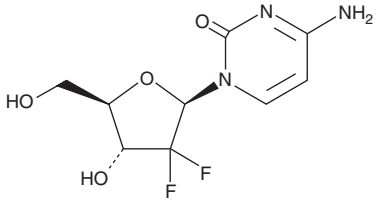
| **CAS Registry No.:** | 95058-81-4 |
| **Formal Name:** | 2'-deoxy-2',2'-difluoro-cytidine |
| **Synonyms:** | DDFC, LY 188011, NSC 613327 |
| **MF:** | $C_9H_{11}N_3O_4F_2$ |
| **FW:** | 263.2 |
| **Purity:** | ≥98% |
| **UV/Vis.:** | $\lambda_{max}$: 243, 269 nm |
| **Supplied as:** | A crystalline solid |
| **Storage:** | -20°C |
| **Stability:** | ≥2 years |




*Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.*

### Laboratory Procedures

Gemcitabine is supplied as a crystalline solid. A stock solution may be made by dissolving the gemcitabine in the solvent of choice. Gemcitabine is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide, which should be purged with an inert gas. The solubility of gemcitabine in these solvents is approximately 0.25, 5, and 0.1 mg/ml, respectively.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of gemcitabine can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of gemcitabine in PBS, pH 7.2, is approximately 2 mg/ml. We do not recommend storing the aqueous solution for more than one day.

### Description

Gemcitabine is an anticancer nucleoside analog that inhibits the growth of HL-60 promyelocytic leukemia cells with an $LC_{50}$ value of 40 nM.[1] It inhibits the growth of MX-1 mammary, CX-1, HC-1, GC3, and VRC5 colon, LX-1, Calu-6, and NCI-H460 lung, and HS766T, PaCa-2, PANC-1, and BxPC-3 pancreatic cancer tumors in mouse xenograft models (45-93% inhibition).[2] Gemcitabine is a prodrug that is metabolized to a diphosphate and triphosphate form in cells. The triphosphate form is incorporated into DNA which induces masked chain termination and cell death.[3] By specifically inhibiting growth arrest and DNA damage inducible protein 45 a (Gadd45a), a key mediator of active DNA demethylation, gemcitabine, at concentrations ranging from 34 to 134 nM, inhibits repair-mediated DNA demethylation in a methylation-sensitive reporter assay. Gemcitabine also has broad antiretroviral activity, decreasing MuLV cell infectivity, a murine AIDS model, in cell culture ($EC_{50}$ = ~1.5 nM) and inhibits the progression of murine AIDS *in vivo* at a dose of 1-2 mg/kg per day.[4]

### References


1. Ross, D.D. and Cuddy, D.P. *Biochem. Pharmacol.* **48(8)**, 1619-1630 (1994).
2. Merriman, R.L., Hertel, L.W., Schultz, R.M., *et al. Invest. New. Drugs* **14(3)**, 243-247 (1996).
3. Schäfer, A., Schomacher, L., Barreto, G., *et al. PLoS One* **5(11)**, 1-9 (2010).
4. Clouser, C.L., Holtz, C.M., Mullett, M., *et al. PLoS One* **6(1)**, 1-8 (2011).





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