FT-BU7721

# β-Galactosidase substrates regulating cell growth

## Products Description

### β-Galactosidase substrates regulating cell growth

| Substrate name<br>cat.number | MW<br>(g·mol$^{-1}$) | $\lambda_{exc}$\$\lambda_{em}$. max.<br>(nm) [a] | mol. abs.<br>($M^{-1}cm^{-1}$) [a] | mol. abs.<br>($M^{-1}cm^{-1}$) | |
|---|---|---|---|---|---|
| **Inhibitors** | | | | | |
| **Fluorouridine-Gal**<br>(M) FP-BU7751, 2mg | 424.33 | [218 / - nm] | . | $H_2O$, DMSO | 5-Fluorouridine 5-O-ß-D-Galactopyranoside |
| **Tetracycline-Gal**<br>(M) FP-BU7761, 5mg | 604.6 | [268 : - nm]<br>[355 / - nm] | 18 000<br>[13 000] | $H_2O$, DMSO | Tetracycline 10-O-ß-D-Galactopyranoside |
| **Chloramphenicol-Gal**<br>(M) FP-BU7721, 5mg | 485.27 | [278 / - nm] | . | $H_2O$, DMSO | Chloramphenicol ß-D-Galactoside |
| **Stimulators** | MW | | | | Comment |
| BU7771, 5mg | 506.64 | | 1-Oleoyl-2-acetyl-3-β-D-Galactopyranosyl rac-glycerol | | Synthetic diglyceride analog that activates protein kinase C. Soluble : H2O, DMSO |
| BU7781, 5mg | 560.71 | | 1-Oleoyl-2-acetyl-3-β-D-Galactopyranosyl sn-glycerol | | Synthetic diglyceride analog that activates protein kinase C. Soluble : H2O, DMSO |
| BU7791, 10mg | 331.33 | | Pyridoxine Galactoside | | Vitamin B6 analog (pyridoxine). Soluble : DMSO, H2O |
| BU7801, 2mg | 315.28 | | Pyridoxal Galactoside | | Vitamin B6 analog (pyridoxine), useful media compenent for lacZ positive cell selection; Soluble : DMSO, abs. EtOH |
| BU7811, 5mg | 342.30 | | Myo-inositol Galactoside | | Derivative of myo-inositol, a component of membrane phospholipidsSoluble : H2O, DMSO |
| BU7831, 2mg | 538.50 | | Riboflavin Galactoside | | Vitamin B2 analog (riboflavin), for transfected lacZ cell selection; Soluble : H2O, DMSO, DMF |
| BU7841, 10mg | 543.53 | | Pantothenic acid 2,4-di-O-β-D-Galactopyranoside | | Vitamin B5 analog (pantothenic acid), for transfected lacZ cell selection. Soluble : DMSO, H2O |
| BU7861, 2mg | 786.50 | | Thiamine Galactoside | | Vitamin B1 analog (thiamine), for transfected lacZ cell selection. Soluble: DMSO, H2O |
| BU7921, 5mg | 477.5 | | 7-N-Benzoyl-Cephalosphoranic acid L-glutamate ester | | Cephalosporin C conjugate, released upon ampicillinase activity, Abs: 280nm |

[a] in brackets: values upon β-galactosidase cleavage.

### β-Glucuronidase substrates regulating cell growth

| Others / Stimulators | MW | | | | Comment |
|---|---|---|---|---|---|
| **Bromoxynil-Glc**<br>(M) FP-BU7891, 2mg | 467.06 | | | DMF, DMSO, EtOH, $H_2O$ | Bromoxynil glucuronic acid methyl ester |
| **Bromoxynil-Glc TAM**<br>(M) FP-BU7871, 2mg | 593.17 | | | DMF, DMSO, EtOH | Bromoxynil glucuronic acid triacetate methyl ester |
| **PET GLU**<br>(M) FP-BM8770, 50mg | | | The hydrophobic thio-glycoside can be used as a inhibitor of β-Glucuronidase activity | | Phenethyl 1-thio-β-D-Glucopyranosiduronic acid ( |

**Storage:** –20°C >1 year. (M) Protect from light and moisture

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# Introduction

One of the most common reporter genes used in molecular biology is the E.coli lac Z gene that coded for an active subunit of β-galactosidase in vivo, due to several features: The E. coli ß-galactosidase enzyme(EC 3.2.1.23) is generally absent in normal mammalian, yeast, some bacteria and even plant cells. Also, the enzyme has a wide substrate specificity (hydrolyzing D-galactose from various labeled ß-galactosides), and it has a high turnover rate. As a result, monitoring lacz expression has become routine to the point of detection of a few as 5 copies of β-galactosidase per cell by FACS analysis. This reporter system is commonly used for monitoring transfection efficiency in mammalian, yeast, and bacterial cells and identifying expression of recombinant fusion genes, as well as co-expressed genes or promoter efficiency.

This technical sheet presents our high quality ß-galactosidase substrates that can be used to regulate cell growth, inhibitors, and stimulators.

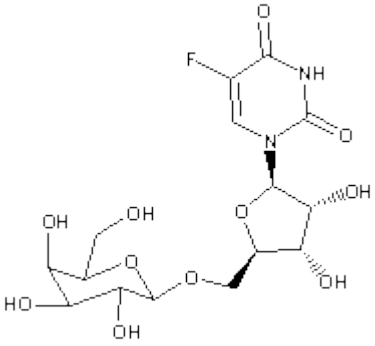


## #BU775 technical & scientific information

5-**Fluorouridine** 5-O-ß-D-Galactopyranoside

This analog of 5-fluorouridine (5-FUR) is useful for lacZ specific release of 5-FUR in recombinant cells or tissues. 5-FUR is a potent anti-metabolite, with mode of action by inhibition of thymidylate synthetase or by incorporation into RNA in vivo.

NOTE: For research purposes only. Not for human or drug use!!




### references – BU775/BU776

Watanabe KA, Matsuda A, Halat MJ, Hollenberg DH, Nisselbaum JS, Fox JJ. (1981)"Nucleosides. 114. 5-O-glucuronides of 5-fluorouridine and 5-fluorocytidine. Masked precursors of anticancer nucleosides."J Med. Chem. 24: 893-897.

Kanzawa F., Hoshi A., Kuretani K., (1980), "Differences between 5-fluoro-2'-deoxyuridine and 5-fluorouridine in their cytotoxic effect on growth of murine lymphoma L5178Y cells in in vivo and in vitro systems." European Journal of Cancer 16(8):1087-92.

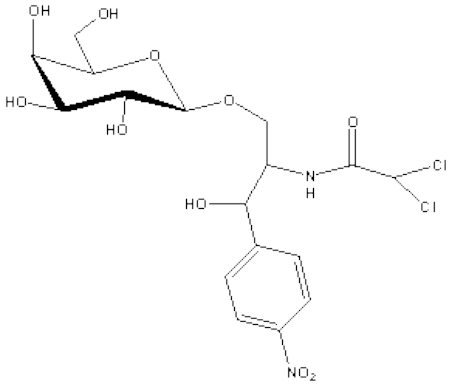
Iapalucci-Espinoza S., Franze-Fernandez M.T., (1982), "Regulation of rRNA synthesis and processing in animal cells. Effect of nucleoside analogues." The Biochemical Journal 202(2):325-32.

Abraham, R., Aman, N., von Borstel, R., Darsley, M., Kamireddy, B., Kenten, J., Morris, G., Titmas, R., (1994), "Conjugates of COL-1 monoclonal antibody and b-d-galactosidase can specifically kill tumor cells by generation of 5-fluorouridine from the prodrug b-d-galactosyl-5-fluorouridine." Cell Biophysics 24/25:127-33.

FT-BU7721

## #BU772 technical & scientific information

**Chloramphenicol** ß-D-Galactoside

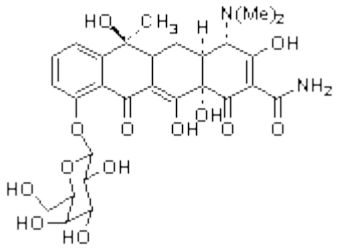


Upon enzymatic or chemical hydrolysis of the galactoside group, chloramphenicol, an antibiotic (bacteriostatic), is produced.

NOTE: For research purposes only. Not for human or drug use!!

## #BU776 technical & scientific information

**Tetracycline** 10-O-ß-D-Galactopyranoside



Tetracycline analog useful as an antibiotic for specific release in lacZ transfected cells and tissues.

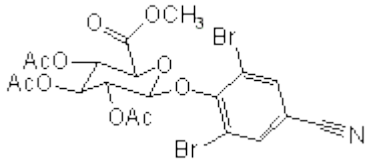
NOTE: Extinction = 268nm(e=18K), 355nm(13K) ; Absorption = 268nm(e=18K), 355nm(13K)

NOTE: For research purposes only. Not for human or drug use!!

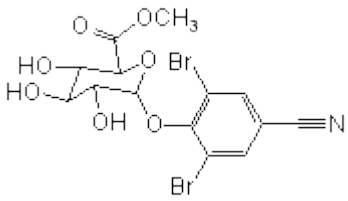
## #BM787/BM789 technical & scientific information

Bromoxynil [1689-84-5] is a nitrile herbicide that is used for post-emergent control of annual broadleaf weeds. It is especially effective in the control of weeds in cereal, corn, sorghum, onions, flax and mint. This bromoxynil derivative can be used for selective release in GUS-positive plant systems, in a tissue specific manner. The compound works by inhibiting photosynthesis in the target plants.

Bromoxynil glucuronic acid triacetate methyl ester



The #BM787 beta-glucuronide derivative lacks activity until acted upon by intracellular beta-glucuronidase (cloned with the GUS marker gene). Additional ester groups help with cell permeation of this herbicide derivative.



The #BM789 beta-glucuronide derivative lacks activity until acted upon by intracellular beta-glucuronidase (cloned with the GUS marker gene). The methyl ester helps with cell permeation in vivo. Hence, the compound can selectively ablate GUS-positive cells and tissues in plant systems.

NOTE: For research purposes only. Not for human or drug use!!

### references – BM787/BM789

Schafer, D.E., Chilcote, D. O., "Translocation and degradation of bromoxynil in a resistant and a susceptible species." Weed Science (1970) 18(6):729-32.

Davis, William H. "Production of genetically-controlled herbicide resistance in cotton plants in the absence of genetic engineering." U.S. Pat. Appl. Publ.(2003) US 20030024015.

FT-BU7721

Heim, Ute; Hillerbrand, Helke; Kunze, Irene; Herbers, Karin; Sonnewald, Uwe; Glickmann, Eric; Lein, Wolfgang; Hell, Ruediger; Jost, Ricarda., "Constitutive promoters of Arabidopsis and their use in expression of foreign genes in transgenic plants." PCT Int. Appl.(2003): WO 0306660.

Cessna, A. J., (1980) "Simultaneous extraction and detection of residues of (2,4-dichlorophenoxy)acetic acid and bromoxynil from wheat." J. Agricultural and Food Chemistry 28(6):1229-32.

## Related / associated products and documents

See BioSciences Innovations catalogue and e-search tool.

- IPTG Lac z inducer (84853C)
- X-Gal (40534M), Blue lacZ β -Galactosidase Detection Kit (X-Gal based), FP-BM8410)
- substrates for β-Glucuronidase (MUGlcU FP-37744) and –Glucosidase (X-GLU 193325)
- Fluorescent Galactoside derivatives (MUGal/CUGal/FDGal/FMGal/TFMU-Gal/Res-Gal: FP-BM8400)

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Please inquire for higher quantities (availability, shipment conditions).

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