Paclitaxel and Fluorescent Paclitaxel Conjugates

Quick Facts

Storage upon receipt:

- ≤–20ºC
- Desiccate
- Protect from light

Ex/Em: See Table 1

Solvent for stock: Methanol, ethanol, DMSO

Introduction

Molecular Probes offers research-grade paclitaxel (P3456), BODIPY® FL paclitaxel (P7500), Oregon Green® 488 paclitaxel (P22310, also known as Flutax-2) and a red-orange fluorescent BODIPY® 564/570 paclitaxel (P7501) (Table 1). Paclitaxel, formerly referred to as taxol in some scientific literature, is the approved generic name for TAXOL®, a registered trademark of Bristol-Myers Squibb Co. for an anticancer pharmaceutical.

The diterpenoid paclitaxel is a potent anti-neoplastic agent [1,2] originally isolated from the bark, and more recently from the needles, of the western yew tree, *Taxus brevifolia*.[3,4] The anti-mitotic and cytotoxic action of paclitaxel is related to its ability to promote tubulin assembly into stable aggregated structures that cannot be depolymerized by dilution, calcium ions, cold or a number of microtubule disrupting drugs.[5,6] Paclitaxel also decreases the critical concentration of tubulin required for microtubule assembly. Cultured cells treated with paclitaxel are blocked in the G2 (the "gap" between DNA synthesis and mitosis) and M (mitosis) phases of the cell cycle.[7]

Table 1. Molecular Probes' paclitaxel and fluorescent paclitaxel conjugates.

Cat #	Label	Ex *	Em *	MW
P3456	Unlabeled	NA	NA	854
P7500	BODIPY FL	505	515	1024
P7501	BODIPY 564/570	565	571	1099
P22310	Oregon Green 488	496	524	1319

* Approximate fluorescence excitation (Ex) and emission (Em) maxima, in nm. NA, not applicable.

The green-fluorescent BODIPY FL and Oregon Green 488 paclitaxels and the red-orange–fluorescent BODIPY 564/570 paclitaxel are demonstrated tools for studying microtubules in solution.[8-10]

For the BODIPY® FL (Figure 1A) and BODIPY® 564/570 (Figure 1B) paclitaxels the *N*-benzoyl substituent of the 3-phenyl-isoserine portion of native paclitaxel is replaced by a BODIPY® propionyl substituent.

The fluorescent label on Oregon Green® 488 paclitaxel is attached by derivatization of the 7-β-hydroxy group of native paclitaxel (Figure 1C), a strategy that permits selective binding of the probe to microtubules.[11]

Though Oregon Green® 488 paclitaxel has been successfully used in the past for live-cell tubulin labeling, Molecular Probes now offers TubulinTracker™ Green, an acetylated version of Oregon Green® 488 paclitaxel which is more soluble and cell-permeant, allowing more uniform and consistent cell labeling, superior selectivity for polymerized tubulin in live cells, and increased ease of use.

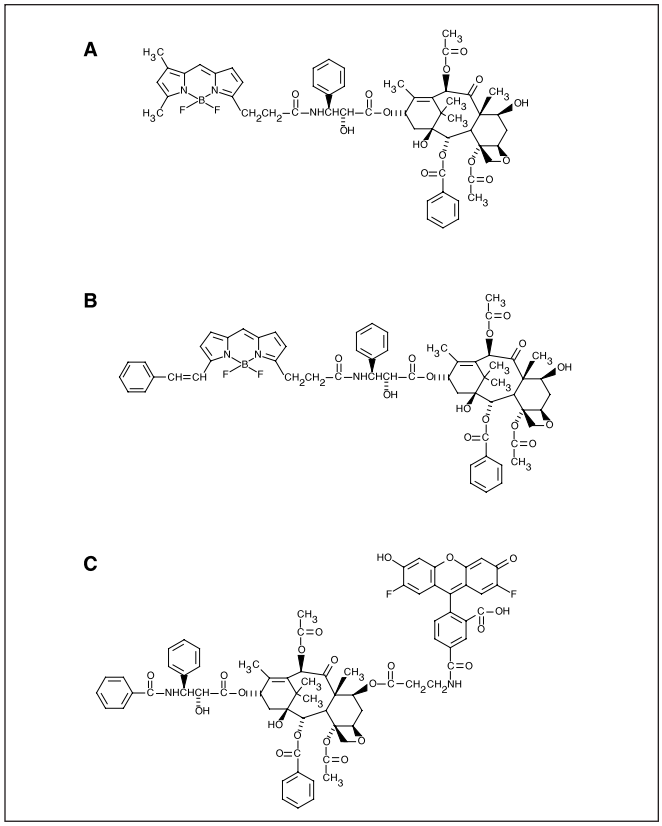

Figure 1. Structures of A) BODIPY FL, B) BODIPY 564/570 paclitaxel analogs, and C) Oregon Green 488.

Storage and Handling

Unlabeled paclitaxel is supplied as a powder in a unit size of 5 mg. BODIPY® FL and BODIPY® 564/570 paclitaxel are supplied lyophilized in a unit size of 10 µg, and the Oregon Green® 488 paclitaxel, in a unit size of 100 µg. These products should be stored frozen at ≤–20°C, desiccated, and protected from light. Concentrated stock solutions can be prepared in methanol, ethanol, or dimethylsulfoxide (DMSO), aliquoted and stored for up to one month frozen at ≤–20°C, protected from light. Aqueous working solutions should be prepared immediately before use. A typical working concentration for experimentation with unlabeled paclitaxel is 0.1 µM and with labeled paclitaxel is 1 µM.

Warning: Paclitaxel is potentially harmful if inhaled, ingested or allowed to contact skin or eyes. Avoid prolonged or repeated exposure. Do not get on skin, in eyes, or on clothing. Wear gloves when using these products and wash thoroughly after handling.

References

1. Invest New Drugs 9, 59 (1991); **2.** J Am Chem Soc 93, 2325 (1971); **3.** J Am Chem Soc 110, 5917 (1988); **4.** Tetrahedron 42, 4451 (1986); **5.** J Cell Biol 112, 1177 (1991); **6.** Pharmacol Ther 25, 83 (1984); **7.** Cancer Treat Rep 62, 1219 (1978); **8.** BioTechniques 25, 188 (1998); **9.** Biochemistry 40, 11975 (2001); **10.** Biochemistry 41, 12436 (2002); **11.** Int J Mol Med 2, 161 (1998).

Product List *Current prices may be obtained from our Web site or from our Customer Service Department.*

Cat #	Product Name	Unit Size
P3456	paclitaxel (Taxol equivalent) *for use in research only*	5 mg
P7501	paclitaxel, BODIPY® 564/570 conjugate (BODIPY® 564/570 Taxol)	10 µg
P7500	paclitaxel, BODIPY® FL conjugate (BODIPY® FL Taxol)	10 µg
P22310	paclitaxel, Oregon Green® 488 conjugate (Oregon Green® 488 Taxol)	100 µg
T34075	TubulinTracker™ Green (Oregon Green® 488 Taxol, bis-acetate) *for live-cell imaging*	1 set

Contact Information

Further information on Molecular Probes products, including product bibliographies, is available from your local distributor or directly from Molecular Probes. Customers in Europe, Africa and the Middle East should contact our office in Paisley, United Kingdom. All others should contact our Technical Service Department in Eugene, Oregon.

Please visit our website — **probes.invitrogen.com** — for the most up-to-date information.

Molecular Probes, Inc.
29851 Willow Creek Road, Eugene, OR 97402
Phone: (541) 465-8300 • Fax: (541) 335-0504

Customer Service: 6:00 am to 4:30 pm (Pacific Time)
Phone: (541) 335-0338 • Fax: (541) 335-0305 • probesorder@invitrogen.com

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Fax: (541) 335-0238 • probestech@invitrogen.com

Invitrogen European Headquarters
Invitrogen, Ltd.
3 Fountain Drive
Inchinnan Business Park
Paisley PA4 9RF, UK
Phone: +44 (0) 141 814 6100 • Fax: +44 (0) 141 814 6260
Email: euroinfo@invitrogen.com
Technical Services: eurotech@invitrogen.com

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