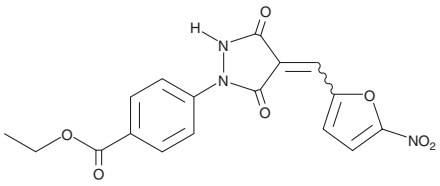
PRODUCT INFORMATION

PYR41

Item No. 15226

CAS Registry No.:	418805-02-4
Formal Name:	4-[4-[(5-nitro-2-furanyl)methylene]-3,5-dioxo-1-pyrazolidinyl]-benzoic acid, ethyl ester
MF:	$C_{17}H_{13}N_3O_7$
FW:	371.3
Purity:	≥95% (mixture of *cis* and *trans* isomers)
UV/Vis.:	λ_{max}: 284, 364 nm
Supplied as:	A crystalline solid
Storage:	-20°C
Stability:	≥4 years



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

Laboratory Procedures

PYR41 is supplied as a crystalline solid. A stock solution may be made by dissolving the PYR41 in the solvent of choice, which should be purged with an inert gas. PYR41 is soluble in organic solvents such as DMSO and dimethyl formamide. The solubility of PYR41 in these solvents is approximately 20 mg/ml.

PYR41 is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, PYR41 should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. PYR41 has a solubility of approximately 0.5 mg/ml in a 1:1 solution of DMSO:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

Description

PYR41 is an irreversible inhibitor of ubiquitin-activating enzyme (E1) with an IC_{50} value of less than 10 µM.[1] PYR41 specifically inhibits ubiquitin-thioester bond formation (IC_{50} = 6.4 µM) and not adenylation.[2] It is selective for E1 over ubiquitin-conjugating enzyme (E2) but does inhibit autoubiquitination of the HECT domain ubiquitin protein ligase (E3) Nedd4 at a concentration of 50 µM in an autoubiquitination assay.[1] It inhibits proteasome-dependent and -independent ubiquitination and protein degradation when used at a concentration of 50 µM. PYR41 prevents activation of NF-κB, ubiquitination of TNF receptor-associated factor 6 (TRAF6), and proteasomal degradation of IκBα. It prevents degradation and induces transcriptional activity of the tumor suppressor p53 and preferentially induces apoptosis of E1A-transformed RPE cells expressing wild-type p53 over non-transformed RPE cells when used at concentrations ranging from 1 to 20 µM. PYR41 also increases net cellular sumoylation and irreversibly cross-links proteins such as JAK2 and Bcr-Abl.[1,3]

References

1. Yang, Y., Kitagaki, J., Dai, R.M., *et al.* Inhibitors of ubiquitin-activating enzyme (E1), a new class of potential cancer therapeutics. *Cancer Res.* **67(19)**, 9472-9481 (2007).
2. Ungermannova, D., Parker, P.J., Nasveschuk, C.G., *et al.* Identification and mechanistic studies of a novel ubiquitin E1 inhibitor. *J. Biomol. Screen.* **17(4)**, 421-434 (2012).
3. Kapuria, V., Peterson, L.F., Showalter, H.D., *et al.* Protein cross-linking as a novel mechanism of action of a ubiquitin-activating enzyme inhibitor with anti-tumor activity. *Biochem. Pharmacol.* **83(4)**, 341-349 (2011).

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