

EGFR (d746-750 T790M) Kinase Assay

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Scientific Background:

EGFR is the receptor for members of the EGF family and is a transmembrane glycoprotein that has tyrosine kinase activity. Binding of epidermal growth factor to EGFR induces receptor dimerization and tyrosine autophosphorylation and leads to cell proliferation, differentiation, motility, and cell survival (1). Activation of EGFR triggers mitogenic signaling in gastrointestinal mucosa, and its expression is upregulated in colon cancers and most neoplasms (2). Activation of EGFR triggers activation of the ERK-signaling pathway in normal gastric epithelial and colon cancer cell lines. Inactivation of EGFR with selective inhibitors significantly reduces ERK2 activation, c-fos mRNA expression and cell proliferation.

1. Wang K, et al: Epidermal growth factor receptor-deficient mice have delayed primary endochondral ossification because of defective osteoclast recruitment. *J. Biol. Chem.* 279: 53848-53856, 2004.
2. Kobayashi S, et al: EGFR mutation and resistance of non-small-cell lung cancer to gefitinib. *New Eng. J. Med.* 352: 786-792, 2005.

ADP-Glo™ Kinase Assay

Description

ADP-Glo™ Kinase Assay is a luminescent kinase assay that measures ADP formed from a kinase reaction; ADP is converted into ATP, which is converted into light by Ultra-Glo™ Luciferase (Fig. 1). The luminescent signal positively correlates with ADP amount (Fig. 2) and kinase activity (Fig. 3A). The assay is well suited for measuring the effects chemical compounds have on the activity of a broad range of purified kinases—making it ideal for both primary screening as well as kinase selectivity profiling (Fig. 3B). The ADP-Glo™ Kinase Assay can be used to monitor the activity of virtually any ADP-generating enzyme (e.g., kinase or ATPase) using up to 1mM ATP.

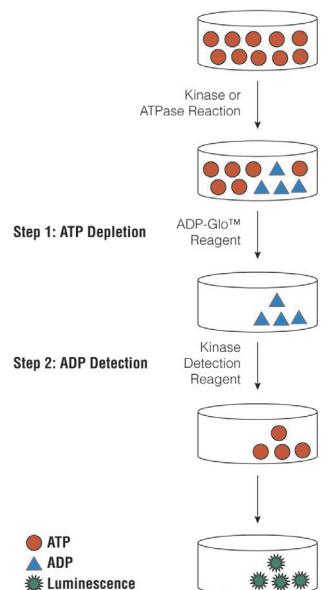


Figure 1. Principle of the ADP-Glo™ Kinase Assay. The ATP remaining after completion of the kinase reaction is depleted prior to an ADP to ATP conversion step and quantitation of the newly synthesized ATP using luciferase/luciferin reaction.

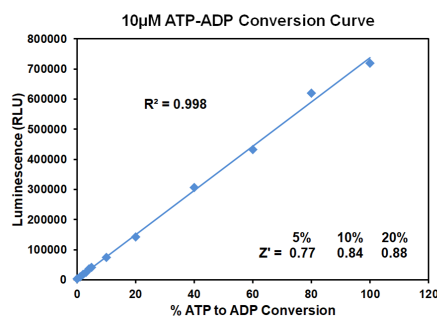


Figure 2. Linearity of the ADP-Glo Kinase Assay. ATP-to-ADP conversion curve was prepared at 10µM ATP+ADP concentration range. This standard curve is used to calculate the amount of ADP formed in the kinase reaction. Z' factors were determined using 200 replicates of each of the % conversions shown.

The following is only a short protocol. For detailed protocols on conversion curves, kinase assays and inhibitor screening, see Kinase Enzyme Systems Protocol at: <http://www.promega.com/KESProtocol>

Short Protocol

- Dilute enzyme, substrate, ATP and inhibitors in 1x kinase reaction buffer.
- Add to the wells of 384 low volume plate:
 - ✓ 1 μ l of inhibitor or (5% DMSO)
 - ✓ 2 μ l of enzyme (defined from table 1)
 - ✓ 2 μ l of substrate/ATP mix
- Incubate at room temperature for indicated time (See Figure 3).
- Add 5 μ l of ADP-Glo™ Reagent.
- Incubate at room temperature for 40 minutes.
- Add 10 μ l of Kinase Detection Reagent.
- Incubate at room temperature for 30 minutes.
- Record luminescence (Integration time 0.5-1 second).

Table 1. Enzyme Titration. Data are shown as relative light units (RLU) that directly correlate to the amount of ADP produced. The correlation between the % of ATP converted to ADP and corresponding signal to background ratio is indicated for each kinase amount.

Enzyme, ng	100	50	25	12.50	6.25	3.13	1.56	0.39	0
Luminescence	249,022	171,954	98,111	50,103	29,236	13,813	6,862	2,241	957
S/B	260	180	103	52	31	14	7	2	1
% Conversion	78	53	30	15	8	3	1	0	0

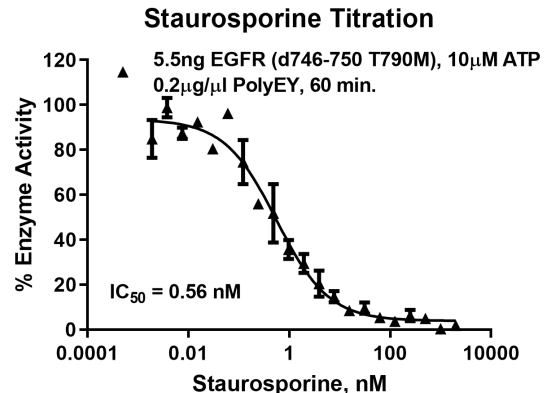
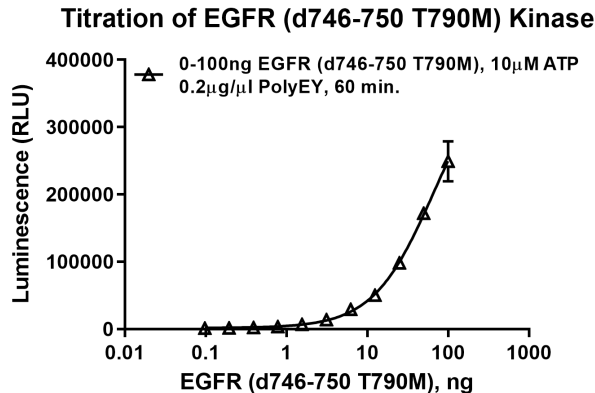


Figure 3. EGFR (d746-750 T790M) Kinase Assay Development. (A) EGFR (d746-750 T790M) enzyme was titrated using 10 μ M ATP and the luminescence signal generated from each of the amounts of the enzyme is shown. (B) Inhibitor dose response was created using 5.5ng of EGFR (d746-750 T790M) to determine the potency of the inhibitor (IC₅₀).



Ordering Information:

Products	Size	Cat. #
EGFR (d746-750 T790M) Kinase Enzyme System	10 μ g	VA7114
	1mg	VA7115
ADP-Glo™ + EGFR (d746-750 T790M) Kinase Enzyme System	1 Each	VA7116