

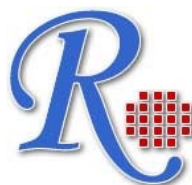
# **RayBio® Cell-Based EGFR (Tyr1068) ELISA kit**

## **User Manual**

### **RayBio® Cell-Based EGFR (Tyr1068) ELISA Kit Protocol**

Cat#: CBEL-EGFR1068-1 (96 assays)

Cat#: CBEL-EGFR1068-2 (192 assays)



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**RayBio® Cell-Based EGFR (Tyr1068)**

**ELISA Kit Protocol**

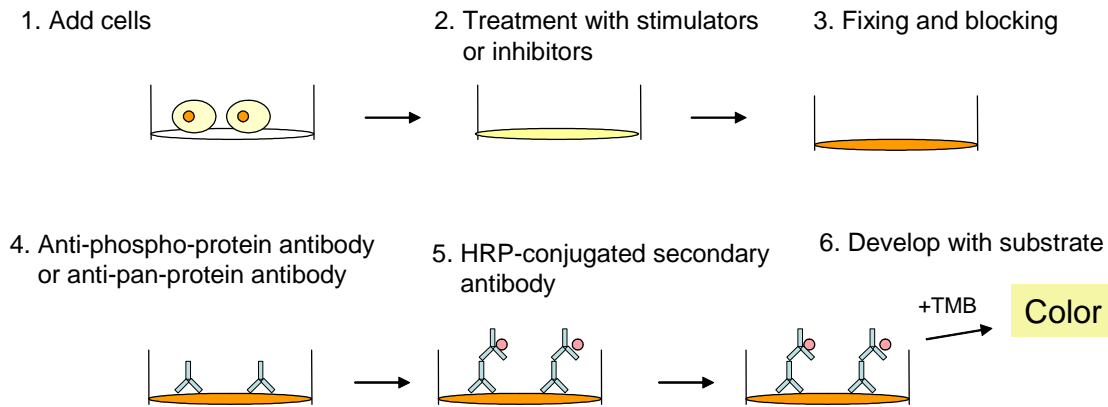
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## I. INTRODUCTION

Protein phosphorylation is instrumental in the regulation of protein activity within a cell. It plays important roles in the living cells including proliferation, differentiation and metabolism. A large number of protein kinases and phosphatases have been extensively investigated, and have been shown to be involved in signal transduction pathways.

The RayBio® Cell-Based EGFR (Tyr1068) ELISA kit is a very rapid, convenient and sensitive assay kit that can monitor the activation or function of important biological pathways in cells. It can be used for measuring the relative amount of EGFR (Tyr1068) phosphorylation and screening the effects of various treatments, inhibitors (such as siRNA or chemicals), or activators **in cultured human, mouse and rat cell lines**. By determining EGFR protein phosphorylation in your experimental model system, you can verify pathway activation in your cell lines without spending excess time and effort in preparing cell lysate and performing an analysis of Western Blot. In the Cell-Based EGFR (Tyr1068) ELISA kit, cells are seeded into a 96 well tissue culture plate. The cells are fixed after various treatments, inhibitors or activators. After blocking, Anti-Phospho-EGFR (Tyr1068) or Anti-EGFR (primary antibody) is pipetted into the wells and incubated. The wells are washed, and HRP-conjugated anti-rabbit IgG (secondary antibody) is added to the wells. The wells are washed again, a TMB substrate solution is added to the wells and color develops in proportion to the amount of protein. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.



**Fig.1. Cell-Based protein phosphorylation procedure**

## II. REAGENTS (96/192 assays per kit )

1. Microplate (Item A): one (96 assays)/two (192 assays) of 96 well tissue culture plate(s) (12 x 8 wells) for cell culture.
2. Wash Buffer Concentrate A (20x) (Item B): 30 ml of 20x concentrated buffer.
3. Wash Buffer Concentrate B (20x) (Item C): 30 ml of 20x concentrated buffer.
4. Fixing Solution (Item D): 30 ml of fixing solution.
5. Quenching Buffer Concentrate (Item E): 2 ml of 30x concentrated solution.
6. Blocking Solution (5x) (Item F): 20 ml of 5x concentrated solution.
7. Rabbit Anti-Phospho-EGFR (Tyr1068) Concentrate (Item G): one (96 assays)/two (192 assays) tube(s) of 6  $\mu$ l of 1000x concentrated anti-phospho-EGFR (Tyr1068).
8. Rabbit Anti-EGFR Concentrate (Item H): one (96 assays)/two (192 assays) tube(s) 6  $\mu$ l of 1000x concentrated anti-EGFR.
9. Anti-Rabbit IgG Concentrate (Item I): one (96 assays)/two (192 assays) tube(s) of 10  $\mu$ l of 2000x concentrated HRP-conjugated anti-rabbit IgG.
10. TMB One-Step Substrate Reagent (Item J): one (96 assays)/two (192

assays) bottle(s) of 12 ml of 3,3',5,5'-tetramethylbenzidine (TMB) in buffered solution.

11. Stop Solution (Item K): 14 ml of sulfuric acid.

### **III. STORAGE**

Upon receipt, the kit should be stored at -20 °C. Please use within 6 months from the date of shipment. Item B, D, E, F, J and I should be stored at 4 °C to avoid repeated freeze-thaw cycles after initial use. Item G and H should be stored at -20 °C after use. Item I store at 2-8 °C for up to one month (store at -20 °C for up to 6 months, avoid repeated freeze-thaw cycles).

### **IV. ADDITIONAL MATERIALS REQUIRED**

- 1 A model cell line, Protein tyrosine kinase inhibitors, growth factor or cytokine.
- 2 Microplate reader capable of measuring absorbance at 450 nm.
- 3 37 °C incubator.
- 4 Precision pipettes to deliver 2 µl to 1 ml volumes.
- 5 Adjustable 1-25 ml pipettes for reagent preparation.
- 6 100 ml and 1 liter graduated cylinders.
- 7 Absorbent paper.
- 8 Distilled or deionized water.

### **V. REAGENT PREPARATION**

1. Wash Buffer A (20x) (Item B) or B (20x) (Item C) should be diluted 20-folds with deionized or distilled water. If the Wash Buffer A (20x) or B (20x) contains visible crystals, warm to room temperature and mix gently until dissolved. Dilute 25 ml of Wash Buffer Concentrate into deionized or distilled water to yield 500 ml of 1x Wash Buffer.

2. Quenching Buffer Concentrate (Item E): should be diluted 30-folds with 1x Wash Buffer A before use.
3. Blocking Solution (5x) (Item F): should be diluted 5-folds with deionized or distilled water.
4. Rabbit Anti-Phospho-EGFR (Tyr1068) Concentrate (Item G): should be diluted 1000-folds with 1x Blocking Solution (Briefly spin the tube, Item G before use).
5. Rabbit Anti-EGFR Concentrate (Item H): should be diluted 1000-folds with 1x Blocking Solution (Briefly spin the tube, Item H before use).
6. Anti-Rabbit IgG Concentrate (Item I): should be diluted 2000-folds with 1x Blocking Solution (Briefly spin the tube, Item I before use).

## VI. ASSAY PROCEDURE:

1. Design your experiment. For example, see Fig2 and 3.
2. Seed 100  $\mu$ l of 20,000 cells into each well in a 96 well plate and incubate for overnight at 37°C, 5% CO<sub>2</sub>.

*Notice: 1). The cell number used is dependent on cell lines and the relative amount of protein phosphorylation . More or less cells may be used.*

*2). Pre-coat the 96 well microplate (Item A) by adding 100  $\mu$ l poly-L-Lysine (sigma, Cat#: P4832) into each well and then follow manufacturer's instructions if seeding HUVECs, HMEC-1 or other loosely attached cells. Or use CellBind or poly-lysine treated tissue culture plates from other brand.*

*3). The cells can be starved 4~24 hours dependent on cell lines prior to treatment (inhibitor or activator).*

3. Apply various treatments, inhibitors (such as siRNA or chemicals) or activators according to manufacturer's instructions. Discard the cell culture medium and wash 3 times with 1x Wash Buffer A (200  $\mu$ l

each). Discard Wash Buffer and then tap the plate upside down to remove all of excess wash buffer.

- 1). Dissolve your inhibitors or activators into serum free cell culture medium and then treat the cells or according to manufacturer's instructions.*
- 2). Please don't directly face the cells with tips when adding any reagents or wash buffers, because the cells may drop off the wells.*

4. Add 100  $\mu$ l of Fixing Solution (Item D) into each well and incubate for 20 minutes at room temperature with shaking.
5. Wash the plate 3 times with 1x Wash Buffer A, then tap the plate upside down to remove all of wash buffer.
6. Add 200  $\mu$ l of prepared 1x Quenching Buffer (Item E) and incubate 20 min at room temperature.
7. Wash the plate 4 times with 1x Wash Buffer A, then tap the plate upside down to remove all of wash buffer.
8. Add 200  $\mu$ l of prepared 1x Blocking Solution (Item F) and incubate for 1 hour at 37°C.
9. Wash 3 times with 1x Wash Buffer B (200  $\mu$ l each), then tap the plate upside down to remove all of excess wash buffer.
10. Add 50  $\mu$ l of 1x Anti-Phospho-EGFR (Tyr1068) (Item G) or 1x Anti-EGFR (Item H) to corresponding well and incubate for 2 hours at room temperature with shaking.
11. Wash 4 times with 1x Wash Buffer B (200  $\mu$ l each), then tap the plate upside down to remove all of excess wash buffer.

12. Add 50  $\mu$ l of 1x Anti-Rabbit IgG (Item I) and incubate for 1 hour at room temperature.
13. Wash 4 times with 1x Wash Buffer B (200  $\mu$ l each), then tap the plate upside down to remove all of excess wash buffer.
14. Add 100  $\mu$ l of TMB to each well and incubate for 30 minutes with shaking at room temperature in the dark.
15. Add 50  $\mu$ l of stop solution to each well and read at 450 nm, measure OD immediately.

## **VII. ASSAY PROCEDURE SUMMARY**

1. Seed 20,000 cells into each well and incubate overnight.



2. Apply various treatment, inhibitors or activators according to manufacturer's instructions.



3. Add 100  $\mu$ l of Fixing Solution into each well and incubate for 20 minutes at room temperature with shaking.



4. Add 200  $\mu$ l of prepared 1x Quenching Buffer and incubate 20 minutes at room temperature.



5. Add 200  $\mu$ l of Blocking Solution and incubate for 1 hour at 37°C.



6. Add 50  $\mu$ l of prepared 1x Anti-Phospho-EGFR (Tyr1068) or

1x Anti-EGFR to each well and incubate for 2 hours at room temperature.



7. Add 50 µl of prepared 1x HRP-Anti-Rabbit IgG and incubate for 1 hour.



8. Add 100 µl TMB One-Step Substrate Reagent to each well.  
Incubate 30 minutes at room temperature.



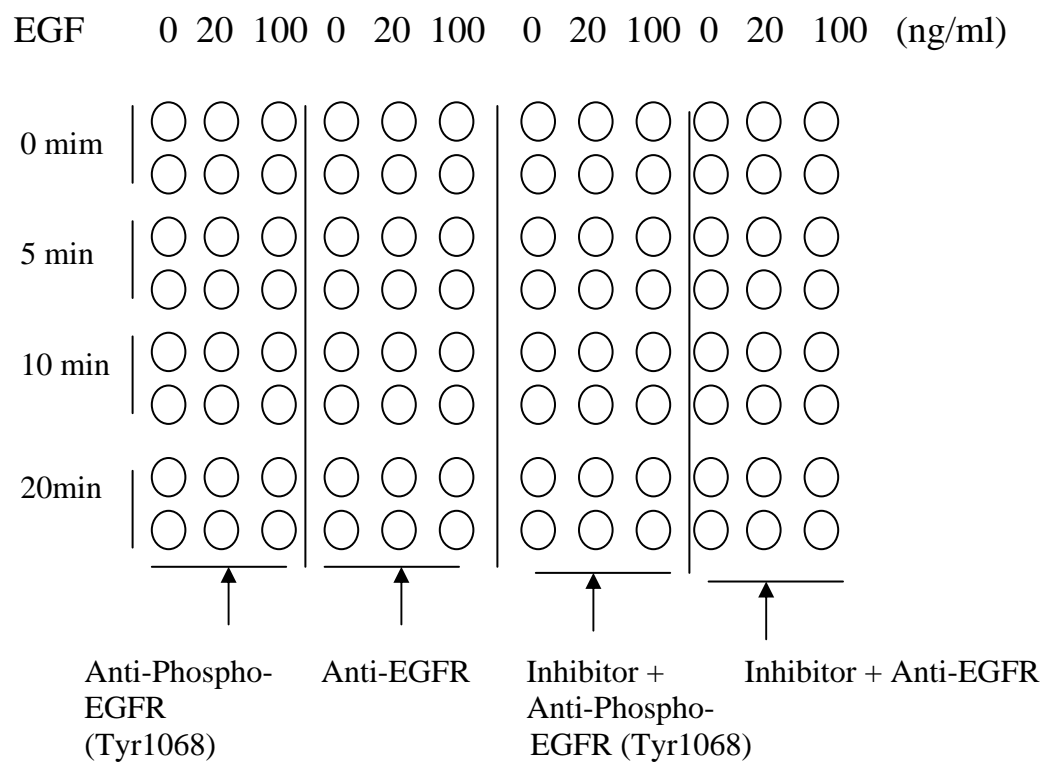
9. Add 50 µl Stop Solution to each well. Read at 450 nm immediately.

## **VIII. QUALITY CONTROL DATA**

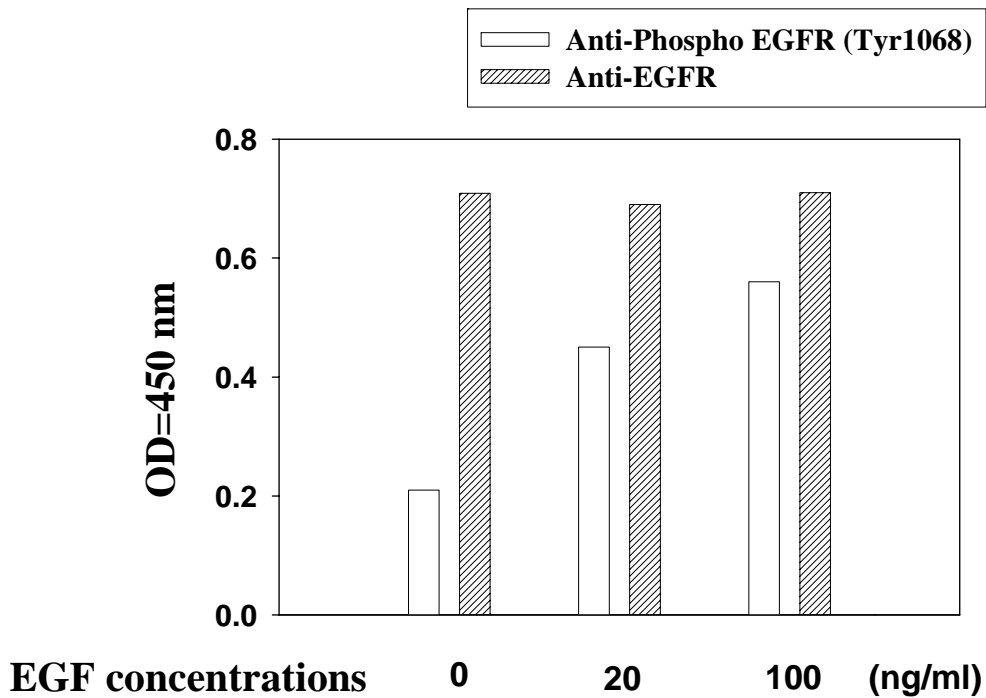
Representative results of Cell-Based EGFR (Tyr1068) are shown below:

Note:

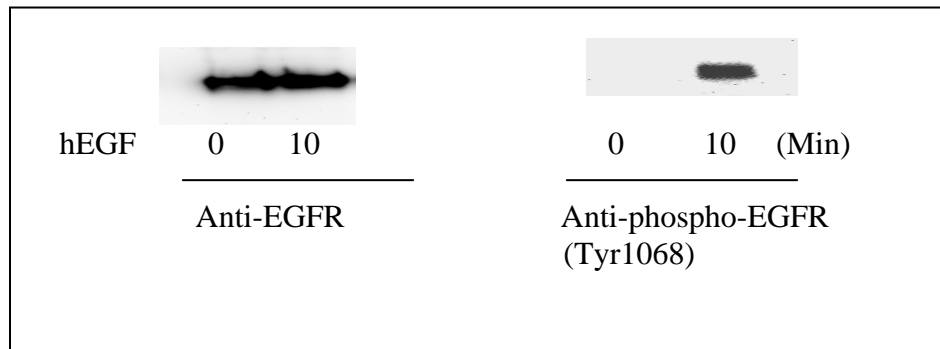
1. Seeded 20,000 A431 cells into appropriate well in microplate. Cells were incubated at 37°C in 5% CO<sub>2</sub> over night.
2. Added 50 µl different concentrations of stimulators (rhEGF concentration for A431 cells: 0, 20 or 100 ng/ml in serum free DMEM ) to appropriate wells (shown below). Then incubated for 10 min at 37°C.
3. Discarded the solution and wash 3 times with 1x Wash Buffer A (200 µl each) immediately. Then tap the plate upside down to remove all of excess wash buffer. And then followed on step 3 to 14 in part VI Assay Procedure.



**Fig. 2. Example of how to seed cells for RayBio® cell-based assay**



**Fig. 3. A431 cells were stimulated by different concentrations of EGF for 10 min at 37°C**



**Fig. 4. Western blot analysis of extracts from 100 ng/ml hEGF treated A431 cells. Phospho-EGFR (Tyr1068) and EGFR antibodies were used in both detection assays.**

## **IX. REFERENCES:**

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- (3) Levkowitz, G. et al. (1999) *Mol. Cell* 4, 1029–1040.
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## X: TROUBLESHOOTING GUIDE

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
1. Low signal	1. Improper storage of the ELISA kit	1. Store the kit according to manual instructions. Keep substrate solution in dark.
	2. Improper dilution	2. Ensure correct preparation of antibody and reagents.
	3. Cells drop off from the wells	3. Some of treatments may make cells drop off the wells. Reduce inhibitor or activator concentration.
2. High background	1. Inadequate washing	1. Be sure to remove all of washing solution and follow the recommendation for washing.
	2. Too much cells	2. Reduce the cell number.
3. Large CV	1. Inaccurate pipetting	1. Check pipette.
	2. Remaining wash buffer in the well	2. Remove all of wash buffer.
	3. Cells drop off from the wells	3. Please don't directly face the cells with tips when adding reagents or wash buffer.

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