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07/19

Carcinoembryonic Antigen (CEA) (Rat) ELISA Kit

(Catalog # E4742-100; 96 assays; Storage at 4ºC)

I. Introduction:

BioVision's Rat Carcinoembryonic Antigen (CEA) ELISA (Enzyme-Linked Immunosorbent Assay) kit is an in vitro enzyme-linked immunosorbent assay for the quantitative measurement of rat CEA. This assay employs an antibody specific for rat CEA coated on a 96-well plate. Standards and samples are pipetted into the wells and CEA present in a sample is bound to the wells by the immobilized antibody. The wells are washed and biotinylated anti-rat CEA antibody is added. After washing away unbound biotinylated antibody, HRP-conjugated streptavidin is pipetted to the wells. The wells are again washed, a TMB substrate solution is added to the wells and color develops in proportion to the amount of CEA bound. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.

II. Applications:

Sensitivity: 0.10 ng/mL
Detection Range: 0.16-10 ng/mL
Coefficient of variation is < 10%
Specificity: No Significant cross-reactivity or interference between Rat CEA and analogues was observed.

III. Sample Type:

- Plasma
- Serum
- Other biological fluids

IV. Kit Contents:

Components	E4742-100	Part Number	Storage Temp
Micro ELISA Plate	8 wells x12 strips	E4742-100-1	-20°C
Standard	2 vials	E4742-100-2	-20°C
Biotinylated Detection Antibody (100x)	120 µl	E4742-100-3	-20°C
HRP Conjugate (100x)	120 µl	E4742-100-4	-20°C (In dark)
Standard & Sample Diluent	20 ml	E4742-100-5	4°C
Biotinylated Detection Antibody Diluent	14 ml	E4742-100-6	4°C
HRP Conjugate Diluent	14 ml	E4742-100-7	4°C
Wash Buffer (25x)	30 ml	E4742-100-8	4°C
Substrate Reagent	10 ml	E4742-100-9	4°C (In dark)
Stop Solution	10 ml	E4742-100-10	4°C
Plate Sealer	4	E4742-100-11	RT

V. User Supplied Reagents and Equipment:

- Deionized or distilled water
- Microplate reader with 450 nm wavelength filter

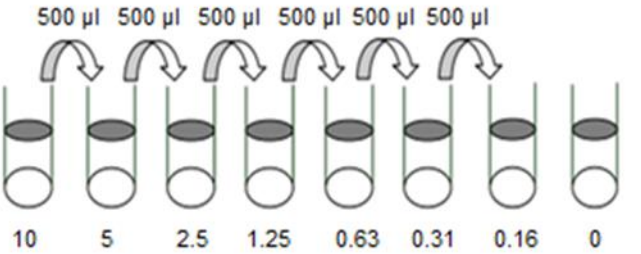
VI.

Storage Conditions and Reagent Preparation:

An unopened kit can be stored at 4°C for 1 month. **If the kit is not used within 1 month, store the items separately according to the following conditions once the kit is received.**

Biotinylated Detection Antibody: Calculate the required amount before the experiment (100 µl/well). Centrifuge the stock tube before use, dilute the 100× Concentrated Biotinylated Detection Ab to 1×working solution with Biotinylated Detection Ab Diluent Wash Buffer: Dilute 30 mL of Concentrated Wash Buffer with 720 mL of deionized or distilled water to prepare 750 mL of Wash Buffer. Note: if crystals have formed in the concentrate, warm it in a 40°C water bath and mix it gently until the crystals have completely dissolved.

HRP Conjugate: Calculate the required amount before the experiment (100µl/well). Dilute the 100x Concentrated HRP Conjugate to 1x working solution with Concentrated HRP Conjugate Diluent.



Wash Buffer: Dilute 30 mL of Concentrated Wash Buffer with 720 mL of deionized or distilled water to prepare 750 mL of Wash Buffer. Note: if crystals have formed in the concentrate, warm it in a 40ºC water bath and mix it gently until the crystals have completely dissolved.

Standard Preparation: Centrifuge the standard at 10,000×g for 1 min. Add 1.0 mL of Standard & Sample Diluent, let it stand for 10 min and invert it gently several times. After it dissolves fully, mix it thoroughly with a pipette. This reconstitution produces a working solution of 10 ng/ml. Then make serial dilutions as needed. The recommended dilution gradient is: 10, 5, 2.5, 1.25, 0.63, 0.32, 0.16 and 0 ng/ml. Prepare 7 tubes, add 500 µl of Standard & Sample Diluent to each tube. Pipette 500 µl of the 10 ng/ml stock solution to the first tube and mix up to produce a 5 ng/ml working solution. Transfer 500 µl of the solution into the other tube to form 2-fold serial dilutions of the highest standards to make the standard curve within the range of this assay.

Sample Preparation:

Note: Samples should be assayed within 7 days when stored at 4°C, otherwise aliquot and stored at -20°C (≤1 month) or -80°C (≤3 months). Avoid repeated freeze-thaw cycles

- **Serum:** Allow samples to clot for 2 hours at room temperature or overnight at 4°C before centrifugation for 20 min at 1000×g at 2~8°C. Collect the supernatant to carry out the assay. Blood collection tubes should be disposable and endotoxin free.
- **Plasma:** Collect plasma using EDTA-Na_2 as anticoagulant. Centrifuge samples for 15 min at 1000x g at 2~8°C within 30 min of collection. Collect the supernatant to carry out the assay. Hemolysed samples are not suitable for ELISA assay!
- **Cell lysates:** For adherent cells, gently wash the cells with moderate amount of pre-cooled PBS and dissociate the cells using trypsin. Collect the cell suspension into a centrifuge tube and centrifuge for 5 min at 1000×g. Discard the medium and wash the cells 3 times with pre-cooled PBS. For each 1×106 cells, add 150-250 µL of pre-cooled PBS to keep the cells suspended. Repeat the freeze-thaw process several times until the cells are fully lysed. Centrifuge for 10 min at 1500xg at 4°C. Remove the cell fragments, collect the supernatant for assay. Avoid repeated freeze-thaw cycles.
- **Tissue homogenates:** It is recommended to get detailed references from the literature before analyzing different tissue types. For general information, hemolysed blood may affect the results, so the tissues should be minced into small pieces and rinsed in ice-cold PBS (0.01M, pH=7.4) to remove excess blood thoroughly. Tissue pieces should be weighed and then homogenized in PBS (tissue weight (g): PBS (mL) volume=1:9) with a glass homogenizer on ice. To further break down the cells, you can sonicate the suspension with an ultrasonic cell disrupter or subject it to freeze-thaw cycles. The homogenates are then centrifuged for 5 min at 5000xg to get the supernatant.
- **Cell culture supernatant or other biological fluids:** Centrifuge samples for 20 min at 1000×g at 2- 8°C. Collect the supernatant for assay.

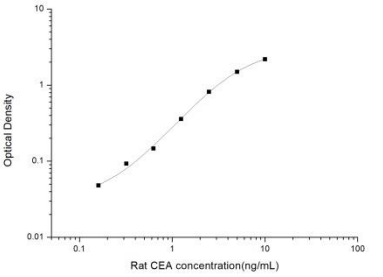
VII. Assay Protocol:

Note: Bring all reagents and samples to room temperature 30 minutes prior to the assay. It is recommended that all standards and samples be run at least in duplicate. A standard curve must be run with each assay.

1. Add 100 µl of each **standard or samples** into appropriate wells. Cover the plate with the plate sealer provided in the kit and incubate for 90 min at 37ºC. Note: solutions should be added to the bottom of the micro ELISA plate well, avoid touching the inside wall and bubble formation as much as possible.
2. Remove the liquid out of each well. Do not wash. Immediately add 100 µl of **Biotinylated Detection Antibody** working solution to each well. Cover the plate with the sealer provided in the kit. Gently mix and incubate for 1 hr. at 37°C.
3. Aspirate the solution from each well add 350 µl of **1x wash buffer** to each well. Soak for 1~2 min and aspirate or decant the solution from each well and pat it dry against clean absorbent paper. Repeat this wash step 3 times.
   Note: a microplate washer can be used in this step and other wash steps.
4. Add 100 µl of **HRP Conjugate working solution** to each well. Cover with the Plate sealer. Incubate for 30 min at 37°C.
5. Aspirate the solution from each well, repeat the wash process for five times as conducted in step 3.
6. Add 90 µl of **Substrate Reagent** to each well. Cover with a new plate sealer. Incubate for about 15 min at 37°C. Protect the plate from light. **Note:** the reaction time can be shortened or extended according to the actual color change, but not more than 30 min.
7. Add 50 µl of **Stop Solution** to each well. Note: adding the stop solution should be done in the same order as the substrate solution
8. Read the absorbance in micro plate reader set to 450 nm.

Calculation: Determine the average of the duplicate readings for each standard and samples then subtract the average zero standard optical density. Plot a four-parameter logistic with standard concentration on the x-axis and OD values on the y-axis. If the samples have been diluted, the concentration calculated from the standard curve must be multiplied by the dilution factor. If the OD of the sample is under the lowest limit of the standard curve, retest the samples with appropriate dilution. The actual concentration is the concentration obtained by calculated multiplied by the dilution factor.

Typical standard curve and data is provided below for reference only. A standard curve must be run with each assay.



Concentration(ng/mL)	10	5	2.5	1.25	0.63	0.32	0.16	0
OD	2.271	1.567	0.896	0.438	0.225	0.171	0.126	0.078
Corrected OD	2.193	1.489	0.818	0.36	0.147	0.093	0.048	-

Precision

Intra-assay Precision (Precision within an assay): 3 samples with low, mid-range and high level Human HB were tested 20 times on one plate, respectively.

Inter-assay Precision (Precision between assays): 3 samples with low, mid-range and high level Human HB were tested on 3 different plates, 20 replicates in each plate

	Intra-assay Precision			Inter-assay Precision		
Sample	1	2	3	1	2	3
n	20	20	20	20	20	20
Mean(ng/mL)	0.52	1.03	3.58	0.49	1.10	3.43
Standard deviation	0.03	0.06	0.12	0.03	0.05	0.14
C V (%)	5.77	5.83	3.35	6.12	4.55	4.08

Recovery

The recovery of Human HB spiked at three different levels in samples throughout the range of the assay was evaluated in various matrices.

Sample Type	Range (%)	Average Recovery (%)
Serum (n=5)	94-109	101
EDTA plasma (n=5)	90-104	98

Linearity

Samples were spiked with high concentrations of Human HB and diluted with Reference Standard & Sample Diluent to produce samples with values within the range of the assay.

		Serum (n=5)	EDTA plasma(n=5)
1:2	Range (%)	87-98	93-111
	Average (%)	93	101
1:4	Range (%)	92-106	83-95
	Average (%)	100	87
1:8	Range (%)	86-99	80-90
	Average (%)	92	86
1:16	Range (%)	89-106	87-100
	Average (%)	97	92

VIII. Related Products:

Carcinoembryonic Antigen (CEA) (Mouse) ELISA Kit (E4741)
Carcinoembryonic Antigen (CEA) (Human) ELISA Kit (E4740)

FOR RESEARCH USE ONLY! Not to be used on humans.