

Human Angiopoietin-2 ELISA Kit

User Manual

Catalog # CEK1011

(Version 1.1B)

Sandwich Enzyme-Linked Immunosorbent Assay for Quantitative Detection of Human Angiopoietin-2 Concentrations in Cell Culture Supernatants, Serum, Plasma.

For research use only. Not for diagnostic or therapeutic procedures.



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I. INTRODUCTION

Angiopoietin-2, ANG-2, is a 496 amino acid secreted protein. After signal sequence processing and maturation, Angiopoietin-2 becomes 478 amino acids long (from 19 to 496). It contains the 1 fibrinogen C-terminal domain which mediates its interaction with TEK/TIE2 receptor. ANG-2 is found to induce tyrosine phosphorylation of TIE2 as well as bind to TIE2 receptor to counteract blood vessel maturation/stability that is mediated by angiopoietin-1. Its function may be context-dependent. In the absence of angiogenic inducers, such as VEGF, ANG2-mediated loosening of cell-matrix contacts may induce endothelial cell apoptosis with consequent vascular regression. In concert with VEGF, it may facilitate endothelial cell migration and proliferation, thus serving as a permissive angiogenic signal.



II. ASSAY PRINCIPLES

The Cohesion Bioscience Human Angiopoietin-2 ELISA (Enzyme-Linked Immunosorbent Assay) kit is an in vitro enzyme-linked immunosorbent assay for the quantitative measurement of Human Angiopoietin-2 in Cell Culture Supernatants, Serum, Plasma. This assay employs an antibody specific for Human Angiopoietin-2 coated on a 96-well plate. Standards and samples are pipetted into the wells and Angiopoietin-2 present in a sample is bound to the wells by the immobilized antibody. The wells are washed and biotinylated anti-Human Angiopoietin-2 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 Angiopoietin-2 bound. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.



III. KIT COMPONENTS

Component	Volume
96-well Plate Coated With Anti-Human Angiopoietin-2 Antibody	8 wells x 12 Strips
Human Angiopoietin-2 Standard	6 ng x 2
Biotin-Labeled Detection Antibody (100X)	120 μl
Streptavidin-HRP (100X)	120 μl
Standard/Sample Diluent	30 ml
Detection Antibody Diluent	12 ml
Streptavidin-HRP Diluent	12 ml
Wash Buffer (20X)	30 ml
TMB Substrate Solution	12 ml
Stop Solution	12 ml
Plate Adhesive Strips	3 Strips
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IV. STORAGE AND STABILITY

All kit components are stable at 2 to 8 °C. Standard (recombinant protein) should be stored at -20 °C or -80 °C (recommended at -80 °C) after reconstitution. Opened Microplate Wells or reagents may be store for up to 1 month at 2 to 8 °C. Return unused wells to the pouch containing desiccant pack, reseal along entire edge. Note: the kit can be used within one year if the whole kit is stored at -20 °C. Avoid repeated freeze-thaw cycles.



V. MATERIALS REQUIRED BUT NOT PROVIDED

- 1. Microplate reader capable of measuring absorbance at 450 nm.
- 2. Adjustable pipettes and pipette tips to deliver 2 μ l to 1 ml volumes.
- 3. Adjustable 1-25 ml pipettes for reagent preparation.
- 4. 100 ml and 1 liter graduated cylinders.
- 5. Absorbent paper.
- 6. Distilled or deionized water.
- 7. Computer and software for ELISA data analysis.
- 8. Tubes to prepare standard or sample dilutions.

VI. HEALTH AND SAFETY PRECAUTIONS

1. Reagents provided in this kit may be harmful if ingested, inhaled or absorbed through the skin. Please carefully review the MSDS for each reagent before conducting the experiment.

2. Stop Solution contains 2 N Sulfuric Acid (H_2SO_4) and is an extremely corrosive agent. Please wear proper eye, hand and face protection when handling this material. When the experiment is finished, be sure to rinse the plate with copious amounts of running water to dilute the Stop Solution prior to disposing the plate.



VII. REAGENT PREPARATION

1. Sample Preparation

Store samples to be assayed within 24 hours at 2-8°C. For long-term storage, aliquot and freeze samples at -20°C. Avoid repeated freeze-thaw cycles.

Cell culture supernates: Remove particulates by centrifugation, assay immediately or aliquot and store samples at -20°C.

Serum: Allow the serum to clot in a serum separator tube (about 4 hours) at room temperature. Centrifuge at approximately 1000 X g for 15 minutes. Analyze the serum immediately or aliquot and store samples at -20°C.

Plasma: Collect plasma using heparin or EDTA as an anticoagulant. Centrifuge for 15 minutes at 1500 X g within 30 minutes of collection. Assay immediately or aliquot and store samples at -20°C.

Cell Lysates: Collect cells and rinse cells with PBS. Homogenize and lyse cells throughly in lysate solution. Centrifuge cell lysates at approximately 10000 X g for 5 minutes to remove debris. Aliquots of the cell lysates were removed and assayed.
Bone Tissue: Extract demineralized bone samples in 4 M Guanidine-HCl and protease inhibitors. Dissolve the final sample in 2 M Guanidine-HCl.

Tissue Homogenates: The preparation of tissue homogenates will vary depending upon tissue type. Rinse tissue with 1X PBS to remove excess blood, homogenized in 20 mL of 1X PBS and stored overnight at \leq -20 °C. After two freeze-thaw cycles were performed to break the cell membranes, the homogenates were centrifuged for 5 minutes at 5000 x g. The supernate was removed immediately and assayed. Alternatively, aliquot and store samples at \leq -20 °C.

Note: Some lysis buffer, such as RIPA can not be used. Some components will affect the binding.

Urine: Urinary samples should be cleared by centrifugation and then can be used directly without dilution. Storage at -20°C.

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2. Human Angiopoietin-2 Standard Preparation

Reconstitute the lyophilized Human Angiopoietin-2 Standard by adding 1 ml of Standard/Sample Diluent to make the 6000 pg/ml standard stock solution. Allow solution to sit at room temperature for 5 minutes, then gently vortex to mix completely. Use within one hour of reconstituting. Two tubes of the standard (6 ng per tube) are included in each kit. Use one tube for each experiment. Perform 2-fold serial dilutions of the top standards to make the standard curve within the range of this assay (46.9 pg/ml - 3000 pg/ml) as below. Standard/Sample Dilution Buffer serves as the zero standard (0 pg/ml).

Standard	Add	Into
3000 pg/ml	500 μl of the Standard (6000 pg/ml)	500 μl of the Standard/Sample Diluent
1500 pg/ml	500 μl of the Standard (3000 pg/ml)	500 μl of the Standard/Sample Diluent
750 pg/ml	500 μl of the Standard (1500 pg/ml)	500 μl of the Standard/Sample Diluent
375 pg/ml	500 μl of the Standard (750 pg/ml)	500 μl of the Standard/Sample Diluent
187.5 pg/ml	500 μl of the Standard (375 pg/ml)	500 μl of the Standard/Sample Diluent
93.8 pg/ml	500 μl of the Standard (187.5 pg/ml)	500 μl of the Standard/Sample Diluent
46.9 pg/ml	500 μl of the Standard (93.8 pg/ml)	500 μl of the Standard/Sample Diluent
0 pg/ml	1 ml of the Standard/Sample Diluent	

Note: The standard solutions are best used within 2 hours. The 6000 pg/ml standard solution should be stored at 4°C for up to 12 hours, or at -20°C for up to 48 hours. Avoid repeated freeze-thaw cycles.

Biotin-Labeled Detection Antibody Working Solution Preparation
 The Biotin-Labeled Detection Antibody should be diluted in 1:100 with the Detection
 Antibody Diluent and mixed thoroughly. The solution should be prepared no more
 than 2 hours prior to the experiment.

4. Streptavidin-HRP Working Solution Preparation



The Streptavidin-HRP should be diluted in 1:100 with the Streptavidin-HRP Diluent and mixed thoroughly. The solution should be prepared no more than 1 hour prior to the experiment.

5. Wash Buffer Working Solution Preparation

Pour entire contents (30 ml) of the Wash Buffer Concentrate into a clean 1,000 ml graduated cylinder. Bring final volume to 600 ml with glass-distilled or deionized water (1:20).



VIII. ASSAY PROCEDURE

The Streptavidin-HRP Working Solution and TMB Substrate Solution must be kept warm at 37°C for 30 minutes before use. When diluting samples and reagents, they must be mixed completely and evenly. Standard detection curve should be prepared for each experiment. The user will decide sample dilution fold by crude estimation of protein amount in samples.

1. Add 100 μl of each standard and sample into appropriate wells.

2. Cover well and incubate for 90 minutes at room temperature or over night at 4°C with gentle shaking.

3. Remove the cover, discard the solution and wash plate 3 times with Wash Buffer Working Solution, and each time let Wash Buffer Working Solution stay in the wells for 1 - 2 minutes. Blot the plate onto paper towels or other absorbent material. Do NOT let the wells completely dry at any time.

4. Add 100 μ l of Biotin-Labeled Detection Antibody Working Solution into each well and incubate the plate at 37°C for 60 minutes.

 5. Wash plate 3 times with Wash Buffer Working Solution, and each time let Wash Buffer Working Solution stay in the wells for 1 - 2 minutes. Discard the Wash Buffer Working Solution and blot the plate onto paper towels or other absorbent material.
 6. Add 100 μl of Streptavidin-HRP Working Solution into each well and incubate the plate at 37°C for 45 minutes.

7. Wash plate 5 times with Wash Buffer Working Solution, and each time let wash buffer stay in the wells for 1 - 2 minutes. Discard the wash buffer and blot the plate onto paper towels or other absorbent material.

8. Add 100 μ l of TMB Substrate Solution into each well and incubate plate at 37°C in dark for 10-20 minutes.

9. Add 100 μl of Stop Solution into each well. The color changes into yellow immediately.

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10. Read the O.D. absorbance at 450nm in a microplate reader within 30 minutes after adding the Stop Solution.

For calculation, (the relative O.D.450) = (the O.D.450 of each well) - (the O.D.450 of Zero well). The standard curve can be plotted as the relative O.D.450 of each standard solution (Y) vs. the respective concentration of the standard solution (X). The concentration of the samples can be interpolated from the standard curve.

Note: If the samples measured were diluted, multiply the dilution factor to the concentrations from interpolation to obtain the concentration before dilution.



IX. ASSAY PROCEDURE SUMMARY

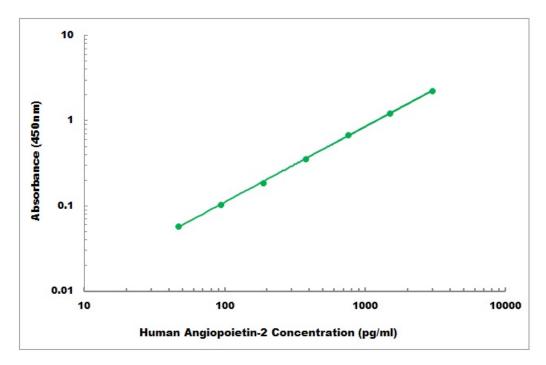


- Add 100 μl Standard or Sample
- Wash plate 3 times with Wash Buffer Working Solution
- Add 100 µl Biotin-Labeled Detection Antibody Working Solution
- Wash plate 3 times with Wash Buffer Working Solution
- Add 100 µl Streptavidin-HRP Working Solution
- Wash plate 5 times with Wash Buffer Working Solution
- Add 100 μl TMB Substrate Solution
- Add 100 µl Stop Solution
- Read the plate at 450nm



X. TYPICAL DATA

The standard curve is for demonstration only. A standard curve must be run with each assay.



XI. SENSITIVITY

The minimum detectable dose of Human Angiopoietin-2 is typically less than 20 pg/ml.

XII. SPECIFICITY

The Human Angiopoietin-2 ELISA Kit allows for the detection and quantification of endogenous levels of natural and/or recombinant Human Angiopoietin-2 proteins within the range of 46.9 pg/ml - 3000 pg/ml.



XIII. CROSS REACTIVITY

No detectable cross-reactivity with other relevant proteins.

XIV. REFERENCES

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XV. TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
High signal and background in	 Insufficient washing 	Increase number of washes
all wells		 Increase time of soaking
		between in wash
	 Too much Streptavidin-HRP 	Check dilution, titration
	 Incubation time too long 	 Reduce incubation time
	Development time too long	Decrease the incubation
		time before the stop solution
		is added
No signal	 Reagent added in incorrect 	Review protocol
	order, or incorrectly prepared	
	 Standard has gone bad (If 	Check the condition of
	there is a signal in the sample	stored standard
	wells)	
	 Assay was conducted from an 	 Reagents allows to come to
	incorrect starting point	20 - 30 °C before performing
		assay
Too much signal-whole plate	 Insufficient washing-unbound 	 Increase number of washes
turned uniformly blue	Streptavidin-HRP remaining	Carefully
	 Too much Streptavidin-HRP 	Check dilution
	Plate sealer or reservoir	 Use fresh plate sealer and
	reused, resulting in presence of	reagent reservoir for each
	residual Streptavidin-HRP	step
Standard curve achieved but	 Plate not developed long 	 Increase substrate solution
poor discrimination between	enough	incubation time
point	 Improper calculation of 	Check dilution, make new
	standard curve dilution	standard curve
No signal when a signal is	Sample matrix is masking	More diluted sample
expected, but standard curve	detection	Recommended
looks fine		
Samples are reading too high,	Samples contain protein levels	Dilute samples and run
but standard curve is fine	above assay range	Again
Edge effect	 Uneven temperature around 	 Avoid incubating plate in
	work surface	areas where environmental
		conditions vary
		 Use plate sealer



XVI. TECHNICAL SUPPORT

For troubleshooting, information or assistance, please go online to www.cohesionbio.com or contact us at techsupport@cohesionbio.com

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XVII. NOTES