

## HUMAN SOLUBLE ACVRL1/ALK-1 ELISA KIT

FOR THE QUANTITATIVE DETERMINATION  
OF HUMAN SOLUBLE ACVRL1  
CONCENTRATIONS IN SERUM



ALWAYS REFER TO LOT SPECIFIC PROTOCOL  
PROVIDED WITH EACH KIT FOR  
INSTRUCTIONS. PROTOCOL MUST BE  
READ BEFORE USING THIS PRODUCT.

FOR RESEARCH USE ONLY. NOT FOR USE IN  
DIAGNOSTIC PROCEDURES.

### PRODUCT INFORMATION:

ELISA NAME	HUMAN SOLUBLE ACVRL1 ELISA KIT
Catalog No.	SK00131-01
Lot No.	
Formulation	96 T
Standard Range	31-2000 pg/mL
Sensitivity	10 pg/mL
Sample Volume	100 µL
Sample Type	Serum
Dilution Factor	<b>Optimal dilutions should be determined by each laboratory for each application</b>
Specificity	Human ACVRL1
Calibration	Human sACVRL1 recombinant
Intra-assay Precision	4 - 6%
Inter-assay Precision	8 - 12%
Storage	2 - 8° C
<b>This kit contains sufficient materials to run 35 samples duplicated provided that assay is run according to protocol.</b>	

Order Contact:  
**AVISCERA BIOSCIENCE, INC.**  
 2348 Walsh Ave., Suite C  
 Santa Clara, CA 95051  
 USA  
 Tel: (408) 982 0300  
 Fax: (408) 982 0301  
 Email: [Sales@AvisceraBioscience.com](mailto:Sales@AvisceraBioscience.com)  
[Info@AvisceraBioscience.com](mailto:Info@AvisceraBioscience.com)  
[www.AvisceraBioscience.com](http://www.AvisceraBioscience.com)

## DESCRIPTION

This Human Soluble ACVRL1 (Activin A receptor, type II - like 1) ELISA Kit contains the necessary components required for the quantitative measurement of recombinant and/or natural human soluble ACVRL1 from serum in a sandwich ELISA format.

This immunoassay contains recombinant human soluble ACVRL1 and antibodies raised against this protein. Results from this immunoassay have shown to accurately quantify recombinant and natural soluble ACVRL1 samples.

## ASSAY OVERVIEW

This assay employs the quantitative sandwich ELISA format. The plate is pre-coated with an antibody specific for human soluble ACVRL1. The capture antibody can bind to the human soluble ACVRL1 in the standard and samples. After washing the plate of any unbound substances, an antibody-HRP conjugate against human soluble ACVRL1 is added to the wells. After the last wash to remove any unbound enzyme, a substrate solution is added to the wells and color develops in direct proportion to the amount of human soluble ACVRL1 bound in the standard solutions or samples. A standard curve can be established and sample values can be read off the standard curve.

## PROCEDURAL LIMITATIONS

\_FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.

\_This ELISA kit should not be used beyond the expiration date on the kit label.

\_Do not mix reagents with those from other lots or sources.

\_It is important that the Dilution Buffer selected for the standard curve be consistent with the samples being assayed.

\_Each laboratory must determine the optimal dilution factors for the samples being assayed with a pretest. If samples generate values that are not within the dynamic range of the standard curve, further concentrate or dilute the samples as required with Dilution Buffer and repeat the assay.

\_Any modifications in buffers, pipetting technique, washing technique, incubation time or temperature, as well as kit age can cause a change in signal.

\_Not all interfering factors have been tested in the immunoassay, therefore the possibility of interference cannot be excluded.

## COMPONENTS PROVIDED

Description	Code	Quantity
<b>sACVRL1 Microplate</b> - 96 well polystyrene microplate coated with an anti-human soluble ACVRL1 antibody.	<b>131-01-01</b>	<b>1 plate</b>
<b>sACVRL1 Standard</b> – 2000 pg/vial of recombinant human soluble ACVRL1 in a buffered protein base with preservative; lyophilized.	<b>131-01-02</b>	<b>1 vial</b>
<b>Detection Antibody-HRP Conjugate</b> – 105 µL/vial of 100-fold concentrated solution of antibody conjugated to HRP against soluble ACVRL1.	<b>131-01-03</b>	<b>1 vial</b>
<b>Positive Control</b> – one vial of recombinant human soluble CD; lyophilized (optional).	<b>431-01-04</b>	<b>1 vial</b>
<b>Dilution Buffer</b> – 60 mL of buffered protein based solution with preservative.	<b>DB10</b>	<b>1 bottle</b>
<b>Wash Buffer</b> - 50 mL of 10-fold concentrated buffered surfactant, with preservative.	<b>WB01</b>	<b>1 bottle</b>
<b>Substrate Solution</b> - 11 mL of TMB substrate solution.	<b>TMB01</b>	<b>1 bottle</b>
<b>Stop Solution</b> - 11 mL of 0.5M HCl.	<b>S-STOP</b>	<b>1 bottle</b>
<b>Plate Sealer</b>	<b>EAPS</b>	<b>1</b>
<b>Plastic Pouch</b>	<b>P01</b>	<b>1</b>

## STORAGE

**Unopened Kit:** Store at 2 – 8° C for up to 8 months. For longer storage, unopened Standard, Positive Control and Detection Antibody-HRP Conjugate 100-fold concentrated solution should be stored at -20° C or -70° C. Substrate Solution can be stored at 2 – 8° C for up to 8 months (**DO NOT FREEZE and PROTECT FROM LIGHT**). All other components can be stored at 2 – 8° C for up to 8 months. Do not use kit past expiration date.

**Microplate Wells:** Return unused microplate strips to the plastic pouch with the desiccant pack. Microplate may be stored for up to 6 months at 2 – 8° C after opening.

**ADDITIONAL MATERIALS REQUIRED**

- Microplate reader capable of absorbance measurement at 450 nm.
- Microplate shaker (300 – 400 rpm).
- Microplate washer or manifold dispenser.
- 100 mL and 500 mL graduated cylinders.
- Multi-channel Pipette, Pipettes and pipette tips.
- Deionized or distilled water.

**PRECAUTION**

This kit should be handled by those persons who have been trained in and can follow the principles of good laboratory practice. Wear protective clothing such as laboratory overalls, safety glasses and gloves. Care should be taken while handling solutions in this kit to avoid contact with skin or eyes, especially with the stop solution because it contains diluted hydrochloric acid. Wash immediately with water in case of contact on skin or eyes.

**SAMPLE COLLECTION AND STORAGE**

**Serum** - Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g. Remove serum and assay immediately or aliquot and store samples at  $\leq -20^{\circ}$  C. Avoid repeated freeze-thaw cycles.

**Plasma** - Collect plasma using EDTA, heparin, or citrate as an anticoagulant. Centrifuge for 15 minutes at 1000 x g within 30 minutes of collection. Assay immediately or aliquot and store samples at  $\leq -20^{\circ}$  C. Avoid repeated freeze-thaw cycles.

**SAMPLE PREPARATION**

Optimal dilutions should be determined by each laboratory for each application.

Use polypropylene test tubes.

**\*In-house testing of pooled research human serum of normal people were 500PG/ML using this ELISA kit.**

**REAGENT PREPARATION**

Bring all reagents to room temperature before use.

**Wash Buffer** - If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Dilute 50 mL of Wash Buffer Concentrate into

deionized or distilled water (450 mL) to prepare 500 mL of 1x Wash Buffer.

**sACVRL1 Standard** - Reconstitute the sACVRL1 standard with 1.0 mL of Dilution Buffer. This reconstitution produces a stock solution of 2000 pg/mL. Allow the stock standard to sit for at least 15 minutes with gentle agitation until completely dissolved prior to making standard dilutions (see below). Mix each tube thoroughly before the next transfer. The **2000 pg/mL** standard serves as the high standard. The Dilution Buffer serves as the zero standard (0 pg/mL).

Tube	Standard	Dilution Buffer	Concentration
Stock	Powder	1000 $\mu$ l	2000 pg/ml
# 1	250 $\mu$ l of stock	250 $\mu$ l	1000 pg/ml
# 2	250 $\mu$ l of 1	250 $\mu$ l	500 pg/ml
# 3	250 $\mu$ l of 2	250 $\mu$ l	250 pg/ml
# 4	250 $\mu$ l of 3	250 $\mu$ l	125 pg/ml
# 5	250 $\mu$ l of 4	250 $\mu$ l	62.5 pg/ml
# 6	250 $\mu$ l of 5	250 $\mu$ l	31.25 pg/ml

**Positive Control** - Reconstitute the Positive Control with 1.0 mL of Dilution Buffer.

**Detection Antibody-HRP Conjugate** - Pipette 10.395 mL of Dilution Buffer into a 15 mL centrifuge tube and transfer 105  $\mu$ L of 100-fold concentrated stock solution to prepare working solution. **Note:** 1x working solution of Detection Antibody-HRP conjugate should be used within a few days (**protect from light**). **DO NOT FREEZE.**

**ELISA PROTOCOL**

Bring all reagents and samples to room temperature before the start of the assay. Blank, standard dilutions, positive control and samples should be assayed in duplicate. ELISA Protocol may need further optimization.

1. Prepare all reagents and working standards as directed in the previous sections.
2. Remove excess microplate strips from the plate frame, return them to the plastic pouch with the desiccant pack.
3. Add 100  $\mu$ L of Dilution Buffer to Blank wells.
4. Add 100  $\mu$ L of Standard dilutions, samples, or positive control per well. Cover with plate sealer. Incubate for 2 hours on microplate shaker at room temperature.

5. Aspirate each well and wash, repeating the process three times for a total of four washes. Wash by filling each well with 1x Wash Buffer (300 µL) using a squirt bottle, manifold dispenser, or autowasher. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
6. Add 100 µL of 1x Detection Antibody-HRP conjugate working solution to each well. Cover with plate sealer. Incubate for 1 hour on microplate shaker at room temperature. **Protect from light.**
7. Repeat the aspiration/wash as in step 5.
8. Add 100 µL of Substrate Solution to each well. Incubate for 20-30 minutes on microplate shaker at room temperature. **Protect from light.**
9. Add 100 µL of Stop Solution to each well. The color in the wells should change from blue to yellow. If the color in the wells is green, or if the color change does not appear uniform, gently tap the plate to ensure thorough mixing.
10. Determine the optical density of each well within 15 minutes, using a microplate reader set to 450 nm.

**CALCULATION OF RESULTS**

Create a standard curve by plotting the log of the known concentrations of the standard dilutions (x-axis) versus the log of its corresponding O.D. (y-axis) and draw the best fit line through the points. It is recommended to use computer software capable of generating a log-log curve fit to more accurately quantify the standard dilutions.

If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

**TYPICAL DATA**

This standard curve is provided for demonstration only. A new standard curve should be generated for each set of samples assayed.

Standard (pg/mL)	Average OD450 (Corrected)
Blank	0 (0.099)
31.25	0.41
62.5	0.091
125	0.172
250	0.345
500	0.683
1000	1.237
2000	2.698

**SPECIFICITY**

PROTEINS	CROSS-REACTIVITY
Human soluble ACVRL1	100
Human soluble ACVR2A	0
Human soluble ACVR2B	0

**SUMMARY OF ASSAY PROCEDURE**

PREPARE REAGENTS, SAMPLES AND STANDARDS
↓
Add 100 µl of standard dilutions, samples, or positive control to each well. Incubate 2 hours on the plate shaker at RT.
↓
Aspirate and wash 4 times.
↓
Add 100 µl per well 1x Detection Antibody-HRP working solution to each well. Incubate 1 hour on the plate shaker at RT. <b>Protect from light.</b>
↓
Aspirate and wash 4 times.
↓
Add 100 µl Substrate Solution to each well. Incubate 20-30 min on the plate shaker at RT. <b>Protect from light.</b>
↓
Add 100 µl Stop Solution to each well. Read 450nm within 15 min.