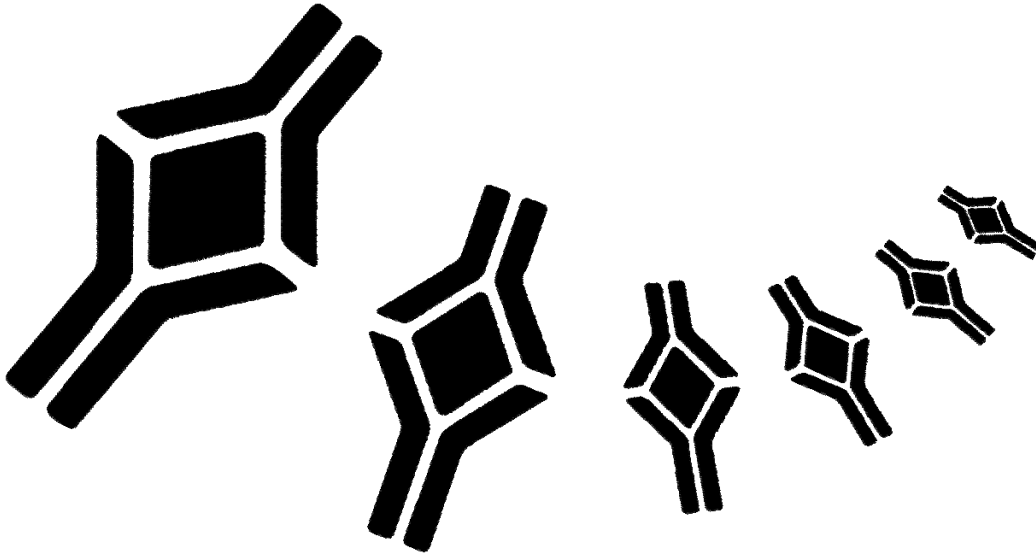


**BioVendor**

Research  
and Diagnostic Products



## **HUMAN SCD44VAR (v6) ELISA**

Product Data Sheet

Cat. No.: RBMS210R

For Research Use Only

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**»» This kit is manufactured by:  
BioVendor – Laboratorní medicína, a.s.**

**»» Use only the current version of Product Data Sheet enclosed with the kit!**

## 1. INTENDED USE

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The sCD44var(v6) ELISA is an enzyme-linked immunosorbent assay for the quantitative detection of soluble sCD44var(v6) levels in cell culture supernatants, human serum, plasma, urine, amniotic fluid, or other body fluids. **The sCD44var(v6) ELISA is for research use only. Not for use in diagnostic or therapeutic procedures.**

## 2. SUMMARY

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CD44 (Pgp-1; Ly-24; ECMR III; F10-44-2; H-CAM; HUTCH-I; In(Lu)-related p80; Hermes antigen; hyaluronan receptor) is a polymorphic glycoprotein which participates in a wide variety of cell-cell or cell-matrix interactions including lymphocyte homing, establishment of B and T cell immune responses, tumor metastasis formation and inflammation.

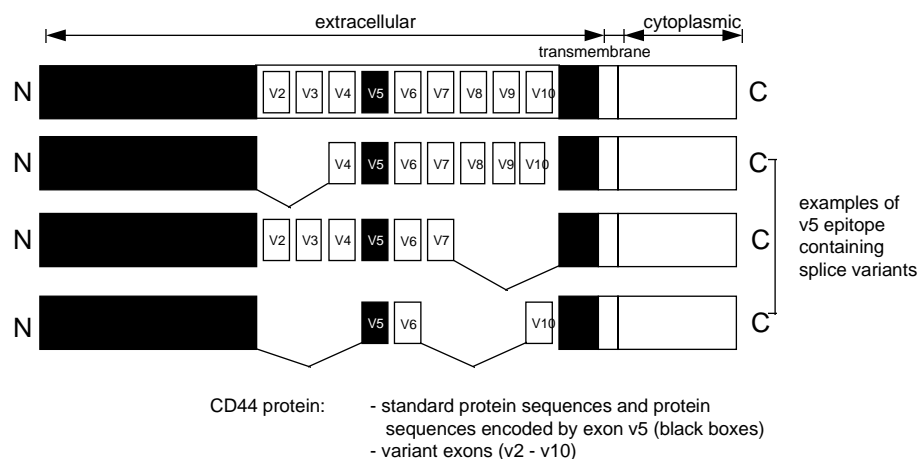
Three isoform categories of the CD44 molecule have been identified:

- 1) a predominant 80-90 kDa category, the so-called standard form named C44std,
- 2) an intermediate size category of 110-160 kDa and
- 3) a category which includes very large isoforms of 250 kDa covalently modified by the addition of chondroitin sulfate (15).

This CD44-family of transmembrane receptor molecules is derived from a single gene located on chromosome 11. Alternative splicing of the mRNA gives rise to the different isoforms, containing inserts of varying sizes in the extracellular domain of the molecule (exons v2-v10). All CD44 isoforms are variably glycosylated. In contrast to standard CD44 (CD44std) which is almost ubiquitously expressed (18), the variety of CD44 isoforms (CD44var) have a much more restricted distribution, e.g., on keratinocytes (exons v3-v10), epithelial cells (exons v8-v10), activated lymphocytes and macrophages (exon v6) (1,6,10,17).

A splice variant of CD44 (exons v4-v7) confers metastatic behaviour in a rat carcinoma model (3); aberrant expression of splice variants has been detected on a variety of human tumor cell lines (7) as well as primary and metastatic human tumors, including lymphomas, carcinomas (colon, thyroid, mamma, bladder), and gliomas (5,6,7,10). Detection of abnormal regulation of CD44 splicing thus could be helpful in cancer diagnosis and disease evaluation (13).

The sCD44var(v6) ELISA detects all circulating CD44 isoforms comprising the sCD44var(v6) sequences.



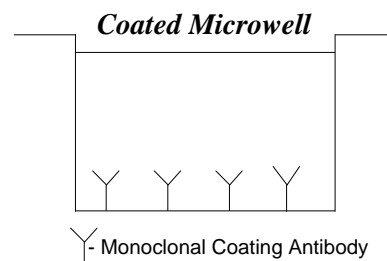
Determination of sCD44var(v6) will provide more detailed insight into different pathological modifications during cancer and other diseases.

- **brain tumors:** CD44 is strongly expressed in high-grade gliomas and weakly expressed in meningiomas, medulloblastomas and normal brain (8).
- **colorectal carcinomas:** in human colorectal neoplasia CD44 variant proteins are found on all invasive carcinomas and during carcinoma metastasis. Variants are already expressed at a relatively early stage of colorectal carcinogenesis and tumor progression (4).

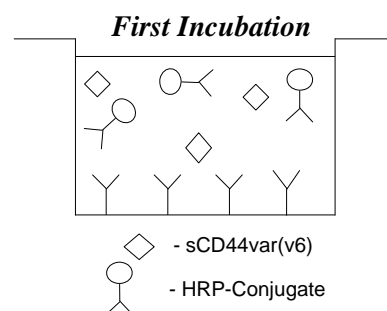
- **gastric cancer:** tumors from patients suffering from stomach adenocarcinomas express CD44 variants. Adenocarcinomas of the intestinal type are strongly positive for exon v5 and v6, whereas diffuse type adenocarcinomas predominantly express exon v5 (4).
- **lung, breast cancer:** in malignant tissues there is gross overproduction of alternatively-spliced large molecular variants in all samples, whereas in the control samples only the standard product was routinely detected with occasional minimal quantities of one or two small variants (13).
- **lymphoma:** in gastrointestinal lymphoma overexpression of CD44 has been correlated with poor survival and more disseminated disease (4,9).  
Overexpression of CD44 is also found in several aggressive, but not low-grade, non-Hodgkin's lymphomas (10) as well as in Hodgkin's and nodal diffuse lymphomas (2).
- **tonsil, skin cancer:** variant CD44 isoform expression can be demonstrated in the plasma membrane of squamous cells of skin and tonsil epithelial and is greatly diminished in malignant squamous epithelial tumors (14,16).
- **HIV:** CD44 is almost completely depleted from the surface of HIV-infected cells (12).
- **inflammatory joint diseases:** CD44 expression was decreased in synovial fluid neutrophils from most patients (8).

### 3. PRINCIPLES OF THE TEST

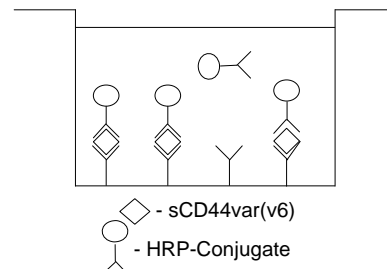
An anti-sCD44var(v6) mono-clonal coating antibody is adsorbed onto microwells.



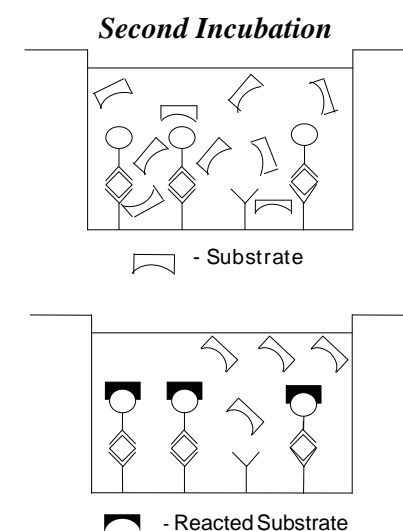
sCD44var(v6) present in the sample or standard binds to antibodies adsorbed to the microwells; a HRP-conjugated monoclonal anti-sCD44var(v6) antibody is added and binds to sCD44var(v6) captured by the first antibody.



Following incubation unbound enzyme conjugated anti-sCD44var(v6) is removed during a wash step and substrate solution reactive with HRP is added to the wells.



A coloured product is formed in proportion to the amount of sCD44var(v6) present in the sample. The reaction is terminated by addition of acid and absorbance is measured at 450nm. A standard curve is prepared from six sCD44var(v6) standard dilutions which allows determination of sCD44var(v6) concentration in samples.



#### 4. REAGENTS PROVIDED

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- 1 aluminium pouch with a **Antibody Coated Microtiter Strips with Monoclonal Antibody** (murine) to human sCD44var(v6)
- 2 vials (10 µl) **HRP-Conjugate** anti-sCD44var(v6) monoclonal (murine) antibody
- 2 vials lyophilized **sCD44var(v6) Standard**. contains 20 ng/ml sCD44var(v6) upon reconstitution
- 1 bottle (50 ml) **Wash Buffer Concentrate** 20x (phosphate-buffered saline with 1% Tween 20)
- 1 vial (5 ml) **Assay Buffer Concentrate** 20x (PBS with 1% Tween 20 and 10% BSA)
- 1 bottle (50 ml) **Sample Diluent** (buffered protein matrix)
- 1 vial (7 ml) **Substrate Solution I** (tetramethyl-benzidine)
- 1 vial (7 ml) **Substrate Solution II** (0.02 % buffered hydrogen peroxide)
- 1 vial (12 ml) **Stop Solution** (1M Phosphoric acid)
- 1 vial (0.4 ml each) **Blue-Dye** and **Green-Dye**
- 2 adhesive **Plate Covers**

#### **Reagent Labels**

## 5. STORAGE INSTRUCTIONS

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Store kit reagents between 2° and 8°C. Immediately after use reagents should be returned to cold storage (2° to 8°C). Expiry of the kit and reagents is stated on labels.

The expiry of the kit components can only be guaranteed if the components are stored properly, and if, in case of repeated use of one component, the reagent is not contaminated by the first handling.

## 6. SPECIMEN COLLECTION

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Cell culture supernatants, human serum, plasmas, urine, amniotic fluid, or other body fluids are suitable for use in the assay. For analysis of **plasma samples** please refer to section 13.H of this manual. Remove the serum or plasma from the clot or red cells, respectively, as soon as possible after clotting and separation.

Samples containing a visible precipitate must be clarified prior to use in the assay. Do not use grossly hemolyzed or lipemic specimens.

Samples must be stored frozen at -20°C to avoid loss of bioactive sCD44var(v6). If samples are to be run within 24 hours, they may be stored at 2° to 8°C. Avoid repeated freeze-thaw cycles. Prior to assay, frozen sera, plasma and urine samples should be brought to room temperature slowly and mixed gently and properly diluted with Sample Diluent according to Test Protocol (see 10.b. page 15).

For sample stability refer to 13. page 23.



## 7. MATERIALS REQUIRED BUT NOT PROVIDED

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- 5 ml and 10 ml graduated pipettes
- 5  $\mu$ l to 1000  $\mu$ l adjustable single channel micropipettes with disposable tips
- 50  $\mu$ l to 300  $\mu$ l adjustable multichannel micropipette with disposable tips
- Multichannel micropipette reservoir
- Beakers, flasks, cylinders necessary for preparation of reagents
- Device for delivery of wash solution (multichannel wash bottle or automatic wash system)
- Microwell strip reader capable of reading at 450 nm (620 nm as optional reference wave length)
- Glass-distilled or deionized water
- Statistical calculator with program to perform linear regression analysis.

## 8. PRECAUTIONS FOR USE

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- All chemicals should be considered as potentially hazardous. We therefore recommend that this product is handled only by those persons who have been trained in laboratory techniques and that it is used in accordance with the principles of good laboratory practice. Wear suitable protective clothing such as laboratory overalls, safety glasses and gloves. Care should be taken to avoid contact with skin or eyes. In the case of contact with skin or eyes wash immediately with water. See material safety data sheet(s) and/or safety statements(s) for specific advice.
- Reagents are intended for research use only and are not for use in diagnostic or therapeutic procedures.
- Do not mix or substitute reagents with those from other lots or other sources.
- Do not use kit reagents beyond expiration date on label.
- Do not expose kit reagents to strong light during storage or incubation.
- Do not pipette by mouth.
- Do not eat or smoke in areas where kit reagents or samples are handled.
- Avoid contact of skin or mucous membranes with kit reagents or specimens.
- Rubber or disposable latex gloves should be worn while handling kit reagents or specimens.
- Reagents containing thimerosal as preservative may be toxic if ingested.

- Avoid contact of substrate solutions with oxidizing agents and metal.
- Avoid splashing or generation of aerosols.
- In order to avoid microbial contamination or cross-contamination of reagents or specimens which may invalidate the test use disposable pipette tips and/or pipettes.
- Use clean, dedicated reagent trays for dispensing the conjugate and substrate reagents.
- Exposure to acids will inactivate the conjugate.
- Glass-distilled water or deionized water must be used for reagent preparation.
- Substrate solutions must be at room temperature prior to use.
- Decontaminate and dispose specimens and all potentially contaminated materials as if they could contain infectious agents. The preferred method of decontamination is autoclaving for a minimum of 1 hour at 121.5°C.
- Liquid wastes not containing acid and neutralized waste may be mixed with sodium hypochlorite in volumes such that the final mixture contains 1.0% sodium hypochlorite. Allow 30 minutes for effective decontamination. Liquid waste containing acid must be neutralized prior to the addition of sodium hypochlorite.

## 9. PREPARATION OF REAGENTS

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Note: reagents A and B (Wash Buffer and Assay Buffer) may be prepared in advance.

Reagents C, D and E (Standard, Conjugate and Substrate) should be prepared immediately before needed.

### A. Wash Buffer

If crystals have formed in the Wash Buffer Concentrate, warm it gently until they have completely dissolved.

Pour entire contents (50 ml) of the **Wash Buffer Concentrate** into a clean 1,000 ml graduated cylinder. Bring final volume to 1,000 ml with glass-distilled or deionized water. Mix gently to avoid foaming. The pH of the final solution should adjust to 7.4.

Transfer to a clean wash bottle and store at 2° to 25°C. Please note that Wash Buffer is stable for 30 days. Wash Buffer may be prepared as needed according to the following table:

Number of Strips	Wash Buffer Concentrate (ml)	Distilled Water (ml)
1 - 6	25	475
1 - 12	50	950

## B. Assay Buffer

Mix the contents of the bottle well. Add contents of **Assay Buffer Concentrate** (5.0 ml) to 95 ml distilled or deionized water and mix gently to avoid foaming. Store at 2° to 8°C. Please note that the Assay Buffer is stable for 30 days. Assay Buffer may be prepared as needed according to the following table:

Number of Strips	Assay Buffer Concentrate (ml)	Distilled Water (ml)
1 - 6	2.5	47.5
1 - 12	5.0	95.0

## C. Preparation of sCD44var(v6)-Standard

The lyophilized standard must be reconstituted with distilled water. Open vial carefully and add distilled water as indicated on vial label. Swirl vial thoroughly to ensure quantitative solubilization of contents.

## D. Preparation of HRP-Conjugate

Dilute the HRP-Conjugate 1:20 just prior to use by adding 190µl **Assay Buffer** (reagent B) to the tube containing the HRP-Conjugate concentrate. Mix the contents of the tube well.

Make a further 1:100 dilution with **Assay Buffer** in a clean plastic tube or reagent reservoir.

Please note that the HRP-Conjugate should be used within 30 minutes after dilution. The second dilution (1:100) of the HRP-Conjugate may be prepared as needed according to the following table:

Number of Strips	Prediluted (1:20) HRP-Conjugate (ml)	Assay Buffer (ml)
1 - 6	0.03	2.97
1 - 12	0.06	5.94

## E. TMB Substrate Solution

Using clean pipettes and containers known to be metal free, dispense an equal volume of **Substrate Solution I** into **Substrate Solution II** and swirl gently to mix. The TMB Substrate Solution may develop a yellow tinge over time. This does not seem to affect product performance. A blue colour present in the TMB Substrate Solution, however, indicates that it has been contaminated and must be discarded. The TMB Substrate Solution must be used within a few minutes after mixing. Warm to room temperature before use. Avoid direct exposure of TMB reagents to intense light and oxidizing agents during storage or incubation.

Substrate preparation by assay size:

Number of Strips	Substrate Solution I (ml)	Substrate Solution II (ml)
1 - 6	3.0	3.0
1 - 12	6.0	6.0

## F. Addition of colour-giving reagents: **Blue-Dye**, **Green-Dye**

This procedure is optional, does not in any way interfere with the test results, and is designed to help the customer with the performance of the test, but can also be omitted, just following the instruction booklet.

Alternatively, the dye solutions from the stocks provided (**Blue-Dye**, **Green-Dye**) can be added to the reagents according to the following guidelines:

- 1. Diluent:** Before sample dilution add the **Blue-Dye** at a dilution of 1:250 (see table below) to the appropriate diluent (1x) according to the test protocol. After addition of **Blue-Dye**, proceed according to the instruction booklet.

5 ml Diluent	20 µl <b>Blue-Dye</b>
12 ml Diluent	48 µl <b>Blue-Dye</b>
50 ml Diluent	200 µl <b>Blue-Dye</b>
60 ml Diluent	240 µl <b>Blue-Dye</b>

- 2. HRP-Conjugate:** Before dilution of the concentrated conjugate, add the **Green-Dye** at a dilution of 1:100 (see table below) to the Assay Buffer used for the final conjugate dilution. Proceed after addition of **Green-Dye** according to the instruction booklet, preparation of HRP-conjugate.

3 ml Assay Buffer	30 µl <b>Green-Dye</b>
6 ml Assay Buffer	60 µl <b>Green-Dye</b>
12 ml Assay Buffer	120 µl <b>Green-Dye</b>

## 10. TEST PROTOCOL

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- a. Mix all reagents thoroughly without foaming before use.
- b. Predilute samples 1:20 with **Sample Diluent** according to the following dilution scheme:
  - I. 10 µl **Sample** + 190 µl **Sample Diluent**
- c. Determine the number of microwell strips required to test the desired number of samples plus appropriate number of wells needed for running blanks and standards. Each sample, standard, blank, and optional control sample should be assayed in duplicate. Remove extra **Microwell Strips coated with Monoclonal Antibody** (murine) to human sCD44var(v6) from holder and store in foil bag with the desiccant provided at 2°-8°C sealed tightly.
- d. Wash the microwell strips twice with approximately 300 µl **Wash Buffer** per well with thorough aspiration of microwell contents between washes. Take care not to scratch the surface of the microwells.

After the last wash, tap microwell strips on absorbent pad or paper towel to remove excess Wash Buffer. Use the microwell strips immediately after washing or place upside down on a wet absorbent paper for not longer than 15 minutes. Do not allow wells to dry.
- e. Add 100 µl of **Sample Diluent**, in duplicate, to the standard wells. Prepare standard dilutions by pipetting 100 µl of **sCD44var(v6) Standard** (20 ng/ml, refer to preparation of reagents 9.C) in duplicate, into well A1 and A2 (see Figure 1 and 2). Mix the contents by repeated aspiration and ejection and transfer 100 µl to well B1 and B2, respectively. Take care not to scratch the inner surface of the microwells. Repeat this procedure four times, creating two parallel rows of sCD44var(v6) standard dilutions ranging from 10 to 0.32 ng/ml. Discard 100 µl of the contents from the last microwells (F1, F2) used.



Figure 1. Preparation of sCD44var(v6) standard dilutions:

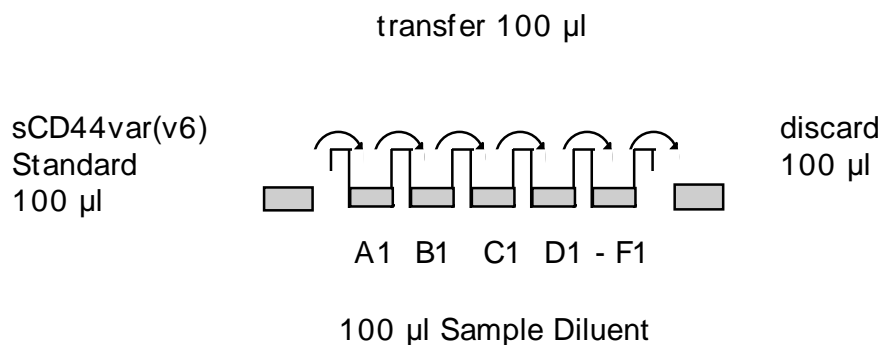


Figure 2. Diagram depicting an example of the arrangement of blanks, standards and samples in the microwell strips:

	1	2	3	4
<b>A</b>	Standard 1 (10 ng/ml)	Standard 1 (10 ng/ml)	Sample 2	Sample 2
<b>B</b>	Standard 2 (5 ng/ml)	Standard 2 (5 ng/ml)	Sample 3	Sample 3
<b>C</b>	Standard 3 (2.5 ng/ml)	Standard 3 (2.5 ng/ml)	Sample 4	Sample 4
<b>D</b>	Standard 4 (1.25 ng/ml)	Standard 4 (1.25ng/ml)	Sample 5	Sample 5
<b>E</b>	Standard 5 (0.63 ng/ml)	Standard 5 (0.63 ng/ml)	Sample 6	Sample 6
<b>F</b>	Standard 6 (0.32 ng/ml)	Standard 6 (0.32 ng/ml)	Sample 7	Sample 7
<b>G</b>	Blank	Blank	Sample 8	Sample 8
<b>H</b>	Sample 1	Sample 1	Sample 9	Sample 9

- f. Add 100 µl of **Sample Diluent**, in duplicate, to the blank wells.
- g. Add 80 µl of **Sample Diluent** to all sample wells.
- h. Add 20 µl of each 1:20 prediluted **Sample**, in duplicate, to the designated sample wells.
- i. Prepare **HRP-Conjugate** (Refer to preparation of reagents).
- j. Add 50 µl of diluted **HRP-Conjugate** to all wells.
- k. Cover with a **Plate Cover** and incubate at room temperature (18° to 25°C) for 3 hours on a rotator set at 100 rpm.
- l. Prepare **TMB Substrate Solution** a few minutes prior to use. (Refer to preparation of reagents).
- m. Remove Plate Cover and empty wells. Wash microwell strips 3 times according to point d. of the test protocol. Proceed immediately to the next step.
- n. Pipette 100 µl of mixed **TMB Substrate Solution** to all wells, including the blank wells.
- o. Incubate the microwell strips at room temperature (18° to 25°C) for about 10 minutes, if available on a rotator set at 100 rpm. Avoid direct exposure to intense light.

**The colour development on the plate should be monitored and the substrate reaction stopped (see point p. of this protocol) before positive wells are no longer properly recordable.**

It is recommended to add the stop solution when the highest standard has developed a dark blue colour.

Alternatively the colour development can be monitored by the ELISA reader at 620nm. The substrate reaction should be stopped as soon as an OD of 0.6 – 0.65 is reached.

- p. Stop the enzyme reaction by quickly pipetting 100 µl of **Stop Solution** into each well, including the blank wells. It is important that the Stop Solution is spread quickly and uniformly throughout the microwells to completely inactivate the enzyme. Results must be read immediately after the Stop Solution is added or within one hour if the microwell strips are stored at 2 - 8°C in the dark.
- q. Read absorbance of each microwell on a spectro-photometer using 450 nm as the primary wave length (optionally 620 nm as the reference wave length; 610 nm to 650 nm is acceptable). Blank the plate reader according to the manufacturer's instructions by using the blank wells. Determine the absorbance of both, the samples and the sCD44var(v6) standards.

**Note:** In case of incubation without shaking the obtained O.D. values may be lower than indicated below. Nevertheless the results are still valid.

## 11. CALCULATION OF RESULTS

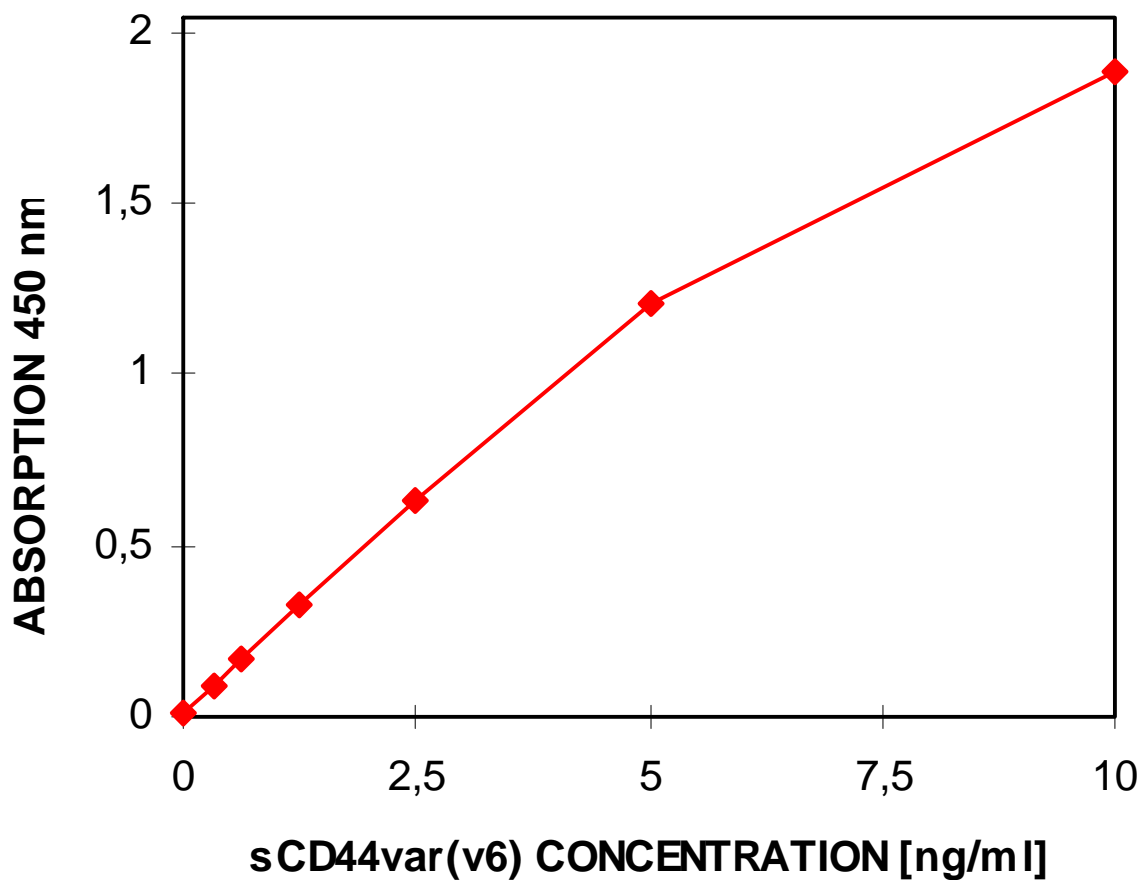
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- Calculate the average absorbance values for each set of duplicate standards and samples. Duplicates should be within 20 per cent of the mean.
- Create a standard curve by plotting the mean absorbance for each standard concentration on the ordinate against the sCD44var(v6) concentration on the abscissa. Draw a best fit curve through the points of the graph.
- To determine the concentration of circulating sCD44var(v6) for each sample, first find the mean absorbance value on the ordinate and extend a horizontal line to the standard curve. At the point of intersection, extend a vertical line to the abscissa and read the corresponding sCD44var(v6) concentration.
- **For samples which have been diluted according to the instructions given in this manual 1:100 the concentration read from the standard curve must be multiplied by the dilution factor (x 100).**

**Note: Calculation of samples with an O.D. exceeding 2.0 may result in incorrect low sCD44var(v6) levels. Such samples require further dilution of 1:200 - 1:400 with Sample Diluent in order to precisely quantitate their actual sCD44var(v6) levels.**

- It is suggested that each testing facility establishes a control sample of known sCD44var(v6) concentration and runs this additional control with each assay. If the values obtained are not within the expected range of the control, the assay results may be invalid.
- A representative standard curve is shown in Figure 3. This curve cannot be used to derive test results.

Figure 3. Representative standard curve for sCD44var(v6) ELISA. Recombinant sCD44var(v6) was diluted in serial two-fold steps in Sample Diluent; symbols represent the mean of three parallel titrations. Do not use this standard curve to derive test results. A new standard curve must be generated for each assay.



## Typical data using the sCD44var(v6) ELISA

Measuring wavelength: 450 nm

Reference wavelength: 620 nm

Standard	sCD44var(v6) Concentration (ng/ml)	O.D. (450 nm)	O.D. Mean	C.V. (%)
1	10	1.749	1.884	7.2
	10	2.019		
2	5	1.246	1.203	3.6
	5	1.159		
3	2.5	0.638	0.628	1.7
	2.5	0.617		
4	1.25	0.334	0.323	3.6
	1.25	0.311		
5	0.625	0.168	0.164	2.8
	0.625	0.159		
6	0.32	0.087	0.085	3.0
	0.32	0.082		
Blank	0	0.010	0.013	16.5
	0	0.015		
	0	0.011		
	0	0.018		

The OD values of the standard curve may vary according to the conditions of assay performance (e.g. temperature effects). Furthermore shelf life of the kit may effect enzymatic activity and thus colour intensity. Values measured are still valid.

## 12. LIMITATIONS

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- Since exact conditions may vary from assay to assay, a standard curve must be established for every run.
- Bacterial or fungal contamination of either screen samples or reagents or cross-contamination between reagents may cause erroneous results.
- Disposable pipette tips, flasks or glassware are preferred, reusable glassware must be washed and thoroughly rinsed of all detergent before use.
- Improper or insufficient washing at any stage of the procedure will result in either false positive or false negative results. Completely empty wells before dispensing fresh Wash Buffer, fill with Wash Buffer as indicated for each wash cycle and do not allow wells to sit uncovered or dry for extended periods.
- The use of radioimmunotherapy has significantly increased the number of patients with human anti-mouse IgG antibody (HAMA). HAMA may interfere with assays utilizing murine monoclonal antibodies leading to both false positive and false negative results. Serum samples containing antibodies to murine immunoglobulins can still be analyzed in such assays when murine immunoglobulins (serum, ascitic fluid, or monoclonal antibodies of irrelevant specificity) are added to the Sample Diluent.

## 13. PERFORMANCE CHARACTERISTICS

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### **A. Sensitivity**

The limit of detection for sCD44var(v6), defined as the analyte concentration resulting in an absorption significantly higher than the absorption of the dilution medium (mean plus two standard deviations) was determined to be 0.05 ng/ml (mean of 10 independent assays).

### **B. Reproducibility**

#### **a. Intra-assay**

Reproducibility within the assay was evaluated in three independent experiments. Each assay was carried out with 6 replicates of 8 serum samples containing different concentrations of sCD44var(v6). Two standard curves were run on each plate. Data below show the mean sCD44var(v6) concentration and the coefficient of variation for each sample. The overall intra-assay coefficient of variation has been calculated to be 3.0 %.



Positive Sample	Experiment	sCD44var(v6) Concentration (ng/ml)	Coefficient of Variation (%)
1	1	143	2.7
	2	157	5.0
	3	143	3.7
2	1	30	1.6
	2	37	4.7
	3	33	2.6
3	1	555	1.1
	2	564	4.3
	3	582	2.3
4	1	367	3.7
	2	391	1.9
	3	405	2.2
5	1	247	1.5
	2	268	2.3
	3	266	3.1
6	1	223	5.0
	2	238	3.4
	3	244	3.1
7	1	298	1.8
	2	309	2.7
	3	324	4.9
8	1	720	1.8
	2	714	3.0
	3	781	1.8

## **b. Inter-Assay**

Assay to assay reproducibility within one laboratory was evaluated in three independent experiments by three technicians. Each assay was carried out with 6 replicates of 8 serum samples containing different concentrations of sCD44var(v6).

Two standard curves were run on each plate. Data below show the mean sCD44var(v6) concentration and the coefficient of variation calculated on 18 determinations of each sample. The overall inter-assay coefficient of variation has been calculated to be 4.2 %.

Sample	sCD44var(v6) Concentration (ng/ml)	Coefficient of Variation (%)
1	148	4.3
2	33	8.8
3	567	2.0
4	388	4.0
5	260	3.6
6	235	3.6
7	310	3.5
8	739	4.1

## C. Recovery Studies

Spiked samples were prepared by adding four different levels of sCD44var(v6) to 2 human serum samples. As shown below, recoveries were determined in two independent experiments ranging from 89 % to 115 % with an overall mean recovery of 105 %.

### Experiment 1

sCD44var(v6) Base level (ng/ml)	Recovery (%) sCD44var(v6) Spike			
	400 ng	200 ng	100 ng	50 ng
217	114	101	92	89

### Experiment 2

sCD44var(v6) Base level (ng/ml)	Recovery (%) sCD44var(v6) Spike			
	400 ng	200 ng	100 ng	50 ng
53	115	112	109	105

## D. Dilution Linearity

Four serum samples with different levels of sCD44var(v6) were assayed at four serial two-fold dilutions (1:100 - 1:800 covering the working range of the standard curve). In the table below the percent recovery of expected values is listed. Recoveries ranged from 98 % to 106 % with an overall mean recovery of 102 %.

Sample	Dilution	sCD44var(v6) Concentration (ng/ml)		
		Expected Value	Observed Value	% Recovery of Exp. Value
1	1:100	--	603	--
	1:200	302	302	100
	1:400	151	153	101
	1:800	77	75	97
2	1:100	--	408	--
	1:200	204	211	103
	1:400	105	108	103
	1:800	54	57	105
3	1:100	--	265	--
	1:200	133	130	98
	1:400	65	66	101
	1:800	33	33	101
4	1:100	--	242	--
	1:200	121	120	99
	1:400	60	61	102
	1:800	30	32	106

## E. Expected Values

A panel of 22 sera from healthy blood donors (male and female) was tested for sCD44var(v6). The detected sCD44var(v6) levels ranged between 83 and 310 ng/ml with a mean level of 170 ng/ml and a standard deviation of 54 ng/ml. Normal sCD44var(v6) levels may vary depending on the serum collective used.

## **F. Sample Freeze-Thaw Stability**

Aliquots of serum samples were stored at -20°C and thawed several times, and the sCD44var(v6) level determined. There was no significant loss of sCD44var(v6) concentrations between 0 and 5 freeze-thaw cycles.

## **G. Sample Storage Stability**

Aliquots of a serum sample were stored at -20°C, 2-8°C, room temperature and at 37°C and the sCD44var(v6) level determined after 24 hours. There was no significant loss of sCD44var(v6) immunoreactivity caused by storage under above conditions.

## **H. Comparison of Serum and Plasma**

Sera, as well as EDTA, citrate and heparin plasmas from 22 individuals were obtained at the same time point. All these blood preparations were found suitable for sCD44var(v6) determinations, although sCD44var(v6) levels in citrate and EDTA plasmas were slightly lower than serum levels. It is, therefore, highly recommended to assure the uniformity of sample preparations!

## **I. Specificity**

This assay recognizes both natural and recombinant forms of the sCD44var(v6) molecule. To define the specificity of this ELISA several structurally related and non-related polypeptides were tested for cross reactivity. Notably, there was no detectable cross reactivity with CD44-polypeptides lacking the protein sequence encoded by exon 6.

## 14. REFERENCES

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- 1) Arch R., K. Wirth, M. Hofmann, H. Ponta, S. Matzku, P. Herrlich, and M. Zöller. (1992). Participation in normal immune responses of a metastasis-inducing splice variant of CD44. *Science* 257, 682-685.
- 2) Fujiwara K., T. Yoshino, K. Miyake, N. Ohara, and T. Akagi. (1993). Expression of a lymphocyte adhesion molecule (CD44) in malignant lymphomas: relevance to primary site, histological subtype and clinical stage. *Acta Med Okayama* 47, 215-222.
- 3) Günthert U., M. Hofmann, W. Rudy, S. Reber, M. Zöller, I. Haußmann, S. Matzku, A. Wenzel, H. Ponta, and P. Herrlich. (1991). A new variant of glycoprotein CD44 confers metastatic potential to rat carcinoma cells. *Cell* 65, 13-24.
- 4) Heider K.H., J. Dämmrich, P. Skroch-Angel, H.K. Müller-Hermelink, H.P. Vollmers, P. Herrlich, and H. Ponta. (1993). Differential expression of CD44 splice variants in intestinal and diffuse type human gastric carcinomas and normal gastric mucosa. *Cancer Res.* 53, 4197-4203.
- 5) Heider K.H., M. Hofmann, E. Hors, F. van den Berg, H. Ponta, P. Herrlich, and S.T. Pals. (1993). A human homologue of the rat metastasis-associated variant of CD44 is expressed in colorectal carcinomas and adenomatous polyps. *J. Cell Biol.* 120, 227-233.
- 6) Herrlich P., W. Rudy, M. Hofmann, R. Arch, M. Zöller, V. Zawadzki, C. Tölg, A. Hekele, S. Pals, K. Heider, J. Sleeman, and H. Ponta. (1993). CD44 and splice variants of CD44 in normal differentiation and tumor progression. In: "Cell adhesion molecules". Eds.: D.M. Livingston et al., Edigraf, Rome - in press -.
- 7) Hofmann M., W. Rudy, M. Zöller, C. Tölg, H. Ponta, P. Herrlich, and U. Günthert. (1991). CD44 splice variants confer metastatic behaviour in rats: Homologous sequences are expressed in human tumor cell lines. *Cancer Res.* 51, 5292-5297.
- 8) Humbria A., F. Diaz-Gonzalez, M.R. Campanero, A.G. Arroyo, A. Laffon, R. Gonzalez-Amaro, and F. Sanchez-Madrid. (1993). Expression of L-selectin, CD43 and CD44 in synovial fluid neutrophils from inflammatory joint diseases. *Arth. Rheumatism.* submitted

- 9) Joensuu H., R. Ristamäki, P.J. Klemi, and S. Jalkanen. (1993). Lymphocyte homing receptor (CD44) expression is associated with poor prognosis in gastrointestinal lymphoma. *Br. J. Cancer* 68, 428-432.
- 10) Koopman G., K.H. Heider, E. Horst, G.R. Adolf, F. van den Berg, H. Ponta, P. Herrlich, and S.T. Pals. (1993). Activated human lymphocytes and aggressive non-Hodgkin's lymphomas express a homologue of the rat metastasis-associated variant of CD44. *J. Exp. Med.* 177, 897-904.
- 11) Kuppner M.C., E. van Meir, T. Gauthier, M.F. Hamou, and N. de Tribolet. (1992) Differential expression of the CD44 molecule in human brain tumours. *Int. J. Cancer* 50, 572-577.
- 12) Lee Guo M.M., and J.E.K. Hildreth. (1993). HIV-induced loss of CD44 expression in monocytic cell lines. *The Journal of Immunology* 151, 2225-2236.
- 13) Matsumura Y., and D. Tarin. (1992). Significance of CD44 gene products for cancer diagnosis and disease evaluation. *The Lancet* 340, 1053-1058.
- 14) Möller P., A. Eichelmann, G. Mechtersheimer, and K. Koretz. (1991). Expression of  $\beta$ 1-Integrins, H-CAM (CD44) and LECAM 1 in primary gastro-intestinal B-cell lymphomas as compared to the adhesion receptor profile of the gut-associated lymphoid system, tonsil and peripheral lymph node. *Int. J. Cancer* 49, 846-855.
- 15) Omary M.B., I.S. Trowbridge, M. Letarte, M.F. Kagnoff, and C.M. Isacke. (1988). Structural heterogeneity of human Pgp-1 and its relationship with p85. *Immunogenetics* 27, 460-464.
- 16) Salmi M., K. Grön-Virta, P. Sointu, R. Grenman, H. Kalimo, and S. Jalkanen. (1993). Related expression of exon v6 containing isoforms of CD44 in man: downregulation during malignant transformation of tumors of squamocellular origin. *J. Cell Biol.* 122, 431-442.
- 17) Stamenkovic I., A. Aruffo, M. Amiot, and B. Seed. (1991). The hematopoietic and epithelial forms of CD44 are distinct polypeptides with different adhesion potentials for hyaluronate-bearing cells. *EMBO J.* 10, 343-348.
- 18) Underhill ICh. (1992). CD44: The hyaluronan receptor. *J. Cell Science* 103, 293-298.

## 15. REAGENT PREPARATION SUMMARY

**A. Wash Buffer** Add **Wash Buffer Concentrate** 20 x (50 ml) to 950 ml distilled water

<b>B. Assay Buffer</b>	Number of Strips	Assay Buffer Concentr. (ml)	Distilled Water (ml)
	1 - 6	2.5	47.5
	1 - 12	5.0	95.0

**C. Standard** Add distilled water as indicated on vial label to vial containing lyophilized standard

**D. HRP Conjugate** Add 190 $\mu$ l **Assay Buffer** to tube containing HRP-Conjugate concentrate. Mix. Make further dilution according to table.

Number of Strips	1:20 Prediluted HRP-Conjugate (ml)	Assay Buffer (ml)
1 - 6	0.03	2.97
1 - 12	0.06	5.94

<b>E. TMB Substrate Solution</b>	Number of Strips	Substrate Solution I (ml)	Substrate Solution II (ml)
	1 - 6	3.0	3.0
	1 - 12	6.0	6.0



## 16. TEST PROTOCOL SUMMARY

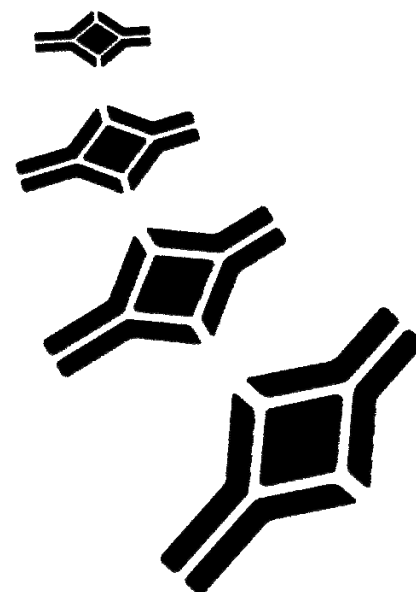
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- Predilute serum, plasma or urine samples with **Sample Diluent** 1:20 (10 µl serum + 190 µl Sample Diluent)
- Wash Microwell Strips twice with **Wash buffer**
- Reconstitue lyophilized **sCD44var(v6) Standard**
- Add 100 µl **Sample Diluent**, in duplicate, to standard wells
- Pipette 100 µl **sCD44var(v6) Standard** into the first standard wells and create standard dilutions ranging from 10 to 0.32 ng/ml by transferring 100 µl from well to well; Discard 100 µl from the last wells.
- Add 100 µl **Sample Diluent**, in duplicate, to the blank wells
- Add 80 µl **Sample Diluent** to all sample wells
- Add 20 µl prediluted **Sample**, in duplicate, to designated wells (=1:100 final dilution)
- Prepare **HRP-Conjugate**
- Add 50 µl diluted **HRP-Conjugate** to all wells
- Cover microwell strips and incubate 3 hours at room temperature (18° to 25°C) on a rotator platform
- Prepare **TMB Substrate Solution** few minutes before use
- Empty and wash microwell strips 3 times with **Wash Buffer**
- Add 100 µl of mixed **TMB Substrate Solution** to all wells including blank wells
- Incubate the microwell strips for about 15 minutes at room temperature (18° to 25°C)
- Add 100 µl **Stop Solution** to all wells including blank wells
- Blank microwell reader and measure colour intensity at 450 nm

**Note:** For samples which have been diluted according to the instructions given in this manual 1:100 the concentration read from the standard curve must be multiplied by the dilution factor (x 100). Calculation of samples with an O.D. exceeding 2.0 may result in incorrect low sCD44var(v6) levels. Such samples require further dilution of 1:200 - 1:400 with Sample Diluent in order to precisely quantitate the actual sCD44var(v6) level.

**NOTES**

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