Human sCD138 (syndecan-1) ELISA Kit

Instructions for use

Catalogue numbers:	1x96 tests:	950.640.096
	2x96 tests:	950.640.192

For research use only

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Human sCD138 (Syndecan-1) ELISA KIT

1. Intended use

The Diaclone Human CD138 ELISA kit is a solid phase sandwich ELISA for the *in-vitro* qualitative and quantitative determination of CD138 in supernatants, buffered solutions or serum and plasma samples. This assay will recognise both natural and recombinant human CD138.

This kit has been configured for research use only. Not suitable for use in therapeutic procedures.

2. Introduction

2.1. Summary

Syndecans are a transmembrane protein family within the heparin sulphate proteoglycan group that interact with many different molecules of the immune system through their heparin sulphate chains. The mammalian syndecan family consists of 4 proteins; syndecan 1 to 4 each encoded by very distinct genes. In adult tissues syndecan 1 (CD138) is predominantly expressed by epithelial cells and plasma cells (both normal and malignant) and currently considered the most reliable surface marker for plasma cells. In addition CD138 is also expressed on pre and immature B cells however this is regulated by IL-6 and LPS stimulation. Syndecan 1 has previously been shown to participate in cell to cell interactions, organ development, vessel formation and tissue regeneration following injury.
CD138 is regularly cleaved from the membrane and as a consequence high levels of soluble CD138 are found in the blood, which can be easily detected using a CD138 specific ELISA.
Via its heparin sulphate chains CD138 binds to and modulates the activity of a wide range of molecules involve in inflammation including chemokines, growth factors, selectins and other adhesion molecules. CD138 can also act as a receptor for collagen, fibronectin, thrombospondin and tenascin therefore involved in cell matrix adhesion. CD138 has been shown to mediate the binding of myeloma cells to type I collagen, and inhibits tumour cell invasion into collagen gels.

As CD138 has been shown to have important effects on tumour cell growth, survival, adhesion and invasion syndecan-1 may be an important regulator in cancer biology.

2.2. Principle of the method

A capture Antibody highly specific for CD138 has been coated to the wells of the microtiter strip plate provided during manufacture. Binding of CD138 samples and known standards to the capture antibodies and subsequent binding of the Biotinylated anti-CD138 secondary antibody to the analyte is completed during the same incubation period. Any excess unbound analyte and secondary antibody is removed.
The HRP conjugate solution is then added to every well including the zero wells, following incubation excess conjugate is removed by careful washing.
A chromogen substrate is added to the wells resulting in the progressive development of a blue coloured complex with the conjugate. The colour development is then stopped by the addition of acid turning the resultant final product yellow. The intensity of the produced coloured complex is directly proportional to the concentration of CD138 present in the samples and standards.
The absorbance of the colour complex is then measured and the generated OD values for each standard are plotted against expected concentration forming a standard curve. This standard curve can then be used to accurately determine the concentration of CD138 in any sample tested.

3. Reagents provided and reconstitution

Reagents (Store@2-8°C)	**Quantity 1x96-well kit** Cat no. 950.640.096	**Quantity 2x96-well kit** Cat no. 950.640.192	**Reconstitution**
Anti-CD138 Coated Plate	1	2	Ready to use (96-well strip pre-coated plate)
Plastic plate covers	2	4	n/a
CD138 Standard: 256 ng/ml	2	4	Reconstitute as directed on the vial (see Assay preparation, section 8)
Standard Diluent	1 (15ml)	1 (25ml)	10X concentrate, dilute in distilled water (see Assay preparation, section 8)
CD138 Control	2	4	Reconstitute as directed on the vial (see Assay preparation, section 8)
Biotinylated Anti-CD138	1 (0.4ml)	2 (0.4ml)	Dilute in Biotinylated Antibody Diluent (see Assay preparation, section 8)
Biotinylated Antibody Diluent	1 (7ml)	1 (13ml)	Ready to use
Streptavidin-HRP	2 (5µl)	4 (5µl)	Add 0.5ml of Streptavidin-HRP Diluent prior to use (see Assay preparation, section 8)
Streptavidin-HRP Diluent	1 (12ml)	1 (23ml)	Ready to use
Wash Buffer	1 (10ml)	2 (10ml)	200X concentrate dilute in distilled water (see Assay preparation, section 8)
TMB Substrate	1 (11ml)	1 (24ml)	Ready to use
H_2SO_4 Stop Reagent	1 (11ml)	2 (11ml)	Ready to use

4. Materials required but not provided

- Microtiter plate reader fitted with appropriate filters (450 nm required with optional 620 nm reference filter)
- Microtiter plate washer or wash bottle
- 10, 50, 100, 200 and 1,000µl adjustable single channel micropipettes with disposable tips
- 50-300µl multi-channel micropipette with disposable tips
- Multichannel micropipette reagent reservoirs
- Distilled water
- Vortex mixer
- Miscellaneous laboratory plastic and/or glass, if possible sterile

5. Storage Instructions

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

Wash Buffer 1X: Once prepared, store at 2-8°C for up to 1 week.

Standard Diluent Buffer 1X: Once prepared, store at 2-8°C for up to 1 week.

Reconstituted Standard/Control: Once prepared use immediately and do not store.

Diluted Biotinylated Anti-CD138: Once prepared use immediately and do not store.

Diluted Streptavidin-HRP: Once prepared use immediately and do not store.

6. Specimen collection, processing & storage

Cell culture supernatants, human serum, plasma or other biological samples will be suitable for use in the assay. Remove serum from the clot or red cells, respectively, as soon as possible after clotting and separation.

Cell culture supernatants: Remove particulates and aggregates by spinning at approximately 1000 x g for 10 min.

Serum: Use pyrogen/endotoxin free collecting tubes. Serum should be removed rapidly and carefully from the red cells after clotting. Following clotting, centrifuge at approximately 1000 x g for 10 min and remove serum.

Plasma: EDTA, citrate and heparin plasma can be assayed. Spin samples at 1000 x g for 30 min to remove particulates. Harvest plasma.

Storage: If not analysed shortly after collection, samples should be aliquoted (250-500µl) to avoid repeated freeze-thaw cycles and stored frozen at –70°C. Avoid multiple freeze-thaw cycles of frozen specimens.

Recommendation: Do not thaw by heating at 37°C or 56°C. Thaw at room temperature and make sure that sample is completely thawed and homogeneous before use. When possible avoid use of badly haemolysed or lipemic sera. If large amounts of particles are present these should be removed prior to use by centrifugation or filtration.

7. Safety & precautions for use

- Handling of reagents, serum or plasma specimens should be in accordance with local safety procedures, e.g. CDC/NIH Health manual : "Biosafety in Microbiological and Biomedical Laboratories" 1984.
- Laboratory gloves should be worn at all times.
- Avoid any skin contact with H_2SO_4 and TMB. In case of contact, wash thoroughly with water.
- Do not eat, drink, smoke or apply cosmetics where kit reagents are used.
- Do not pipette by mouth.
- When not in use, kit components should be stored refrigerated as indicated on vials or bottles labels.
- All reagents should be warmed to room temperature before use. Lyophilized standards should be discarded after use.
- Once the desired number of strips has been removed, immediately reseal the bag to protect the remaining strips from deterioration.
- Cover or cap all reagents when not in use.
- Do not mix or interchange reagents between different lots.
- Do not use reagents beyond the expiration date of the kit.
- Use a clean disposable plastic pipette tip for each reagent, standard, or specimen addition in order to avoid cross contamination, for the dispensing of H_2SO_4 and TMB Substrate solutions, avoid pipettes with metal parts.
- Use a clean plastic container to prepare the washing solution.
- Thoroughly mix the reagents and samples before use by agitation or swirling.
- All residual washing liquid must be drained from the wells by efficient aspiration or by decantation followed by tapping the plate forcefully on absorbent paper. Never insert absorbent paper directly into the wells.
- The TMB Substrate solution is light sensitive. Avoid prolonged exposure to light. Also, avoid contact of the TMB Substrate solution with metal to prevent colour development. Warning TMB Substrate is toxic avoid direct contact with hands. Dispose off properly.
- If a dark blue colour develops within a few minutes after preparation, this indicates that the TMB solution has been contaminated and must be discarded. Read absorbances within 1 hour after completion of the assay.
- When pipetting reagents, maintain a consistent order of addition from well-to-well. This will ensure equal incubation times for all wells.
- Follow incubation times described in the assay procedure.
- Dispense the TMB Substrate within 15 min of the washing of the microtiter plate.

8. Assay Preparation

Bring all reagents to room temperature before use

8.1. Assay Design

Determine the number of microwell strips required to test the desired number of samples plus appropriate number of wells needed for running zeros and standards. Each sample, standard, zero and control should be tested **in duplicate**. Remove sufficient microwell strips for testing from the pouch immediately prior to use. Return any wells not required for this assay with desiccant to the pouch. Seal tightly and return to 2-8°C storage.

Example plate layout (example shown for a 6 point standard curve)

	Standards / Controls		Sample Wells									
	1	2	3	4	5	6	7	8	9	10	11	12
A	256	256										
B	128	128										
C	64	64										
D	32	32										
E	16	16										
F	8	8										
G	0	0										
H	Ctrl	Ctrl										

All remaining empty wells can be used to test samples in duplicate

8.2. Preparation of Wash Buffer

If crystals have formed in the concentrate Wash Buffer, warm it gently until complete dissolution.

Dilute the (200X) concentrate Wash Buffer 200 fold with distilled water to give a 1X working solution. Pour entire contents (10 ml) of the concentrate Wash Buffer into a clean 2,000 ml graduated cylinder. Bring final volume to 2,000 ml with glass-distilled or deionized water. Mix gently to avoid foaming. Transfer to a clean wash bottle and store at 2˚-25˚C.

8.3. Preparation of Standard Diluent Buffer 1X

If crystals have formed in the concentrate Standard Diluent, warm it gently until complete dissolution.

Dilute the (10X) concentrate Standard Diluent 10 fold with distilled water to give a 1X working solution. Pour entire contents of the concentrate Standard Diluent into a clean appropriate graduated cylinder. Bring to final volume with glass-distilled or deionized water. Transfer to a clean wash bottle and store at 2˚-25˚C. Please see example volumes below:

Standard Diluent concentrate (ml)	Distilled water (ml)
15	135
25	225

8.4. Preparation of Standard

Standard vials must be reconstituted with the volume of Standard Diluent Buffer 1X shown on the vial immediately prior to use. This reconstitution gives a stock solution of 256 ng/ml of CD138. Mix the reconstituted standard gently by inversion only. Serial dilutions of the standard are made directly in the assay plate to provide the concentration range from 256 to 8 ng/ml. A fresh standard curve should be produced for each new assay.

- Immediately after reconstitution add 200µl of the reconstituted standard to wells A1 and A2, which provides the highest concentration standard at 256 ng/ml.
- Add 100µl of Standard Diluent Buffer 1X to the remaining standard wells B1 and B2 to F1 and F2.
- Transfer 100µl from wells A1 and A2 to B1 and B2. Mix the well contents by repeated aspirations and ejections taking care not to scratch the inner surface of the wells.
- Continue this 1:1 dilution using 100µl from wells B1 and B2 through to wells F1 and F2 providing a serial diluted standard curve ranging from 256 ng/ml to 8 ng/ml.
- Discard 100µl from the final wells of the standard curve (F1 and F2).

Alternatively these dilutions can be performed in separate clean tubes and immediately transferred into the relevant wells.

8.5. Preparation of Control

The supplied Control must be reconstituted with the volume of Standard Diluent Buffer 1X indicated on the vial. Reconstitution of the freeze-dried material with the indicated volume, will give a solution at the concentration stated on the vial. Do not store after use.

8.6. Preparation of Biotinylated Anti-CD138

It is recommended this reagent is prepared immediately before use. Dilute the Biotinylated Anti-CD138 with the Biotinylated Antibody Diluent in an appropriate clean glass vial using volumes appropriate to the number of required wells. Please see example volumes below:

Number of wells required	Biotinylated Antibody (µl)	Biotinylated Antibody Diluent (µl)
16	40	1060
24	60	1590
32	80	2120
48	120	3180
96	240	6360

8.7. Preparation of Streptavidin-HRP

It is recommended to centrifuge vial for a few seconds in a microcentrifuge to collect all the volume at the bottom.

Dilute the 5µl vial with 0.5ml of Streptavidin-HRP Diluent **immediately before use.** Do not keep this diluted vial for future experiments. Further dilute the HRP solution to volumes appropriate for the number of required wells in a clean glass vial. Please see example volumes below:

Number of wells required	Streptavidin-HRP (µl)	Streptavidin-HRP Diluent (ml)
16	30	2
24	45	3
32	60	4
48	75	5
96	150	10

9. Method

We strongly recommend that every vial is mixed thoroughly without foaming prior to use.

Prepare all reagents as shown in section 8.
Note: final preparation of Biotinylated Antibody (section 8.6) and Streptavidin-HRP (section 8.7) should occur immediately before use.

Assay Step		Details
1.	Addition	**Prepare standard curve** as shown in section 8.4 above and add in duplicate to appropriate wells
2.	Addition	Add 100µl of each **Sample, Control and zero (Standard Diluent Buffer 1X)** in duplicate to appropriate number of wells
3.	Addition	Add 50µl of diluted **Biotinylated Anti-CD138** to all wells
4.	Incubation	Cover with a plastic plate cover and incubate at room temperature (18 to 25°C) for **1 hour**
5.	Wash	Remove the cover and wash the plate as follows: a) Aspirate the liquid from each well b) Dispense 0.3 ml of **1x Wash Buffer** into each well c) Aspirate the contents of each well d) Repeat step b and c another two times
6.	Addition	Add 100µl of diluted **Streptavidin-HRP** solution into all wells
7.	Incubation	Cover with a plastic plate cover and incubate at room temperature (18 to 25°C) for **30 min**
8.	Wash	Repeat wash step 5.
9.	Addition	Add 100µl of ready-to-use **TMB Substrate** into all wells
10.	Incubation	Incubate in the dark for **12-15 minutes*** at room temperature. Avoid direct exposure to light by wrapping the plate in aluminium foil.
11.	Addition	Add 100µl of **H_2SO_4 Stop Reagent** into all wells
Read the absorbance value of each well (immediately after step 11.) on a spectrophotometer using 450 nm as the primary wavelength and optionally 620 nm as the reference wave length (610 nm to 650 nm is acceptable).		

** Incubation time of the TMB substrate is usually determined by the ELISA reader performance. Many ELISA readers only record absorbance up to 2.0 O.D. Therefore the colour development within individual microwells must be observed by the analyst, and the substrate reaction stopped before positive wells are no longer within recordable range.*

10. Data Analysis

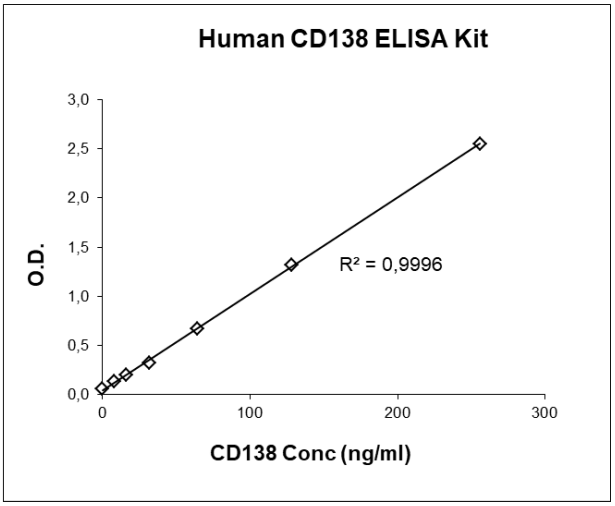
Calculate the average absorbance values for each set of duplicate standards, control and samples. Ideally duplicates should be within 20% of the mean.

Generate a linear standard curve by plotting the average absorbance of each standard on the vertical axis versus the corresponding CD138 standard concentration on the horizontal axis.

The amount of CD138 in each sample is determined by extrapolating OD values against CD138 standard concentrations using the standard curve**.**

Example CD138 Standard curve

Standard	CD138 Conc (ng/ml)	OD (450nm) mean	CV (%)
1	256	2.554	7.4
2	128	1.317	10.8
3	64	0.667	2.0
4	32	0.320	8.8
5	16	0.199	1.4
6	8	0.132	9.1
zero	0	0.053	24.0



Note: curve shown above should not be used to determine results. Every laboratory must produce a standard curve for each set of microwell strips assayed.

11. Assay limitations

Do not extrapolate the standard curve beyond the maximum standard curve point. The dose-response is non-linear in this region and good accuracy is difficult to obtain. Concentrated samples above the maximum standard concentration must be diluted with Standard Diluent Buffer or with your own sample buffer to produce an OD value within the range of the standard curve. Following analysis of such samples always multiply results by the appropriate dilution factor to produce actual final concentration.

The influence of various drugs on end results has not been investigated. Bacterial or fungal contamination and laboratory cross-contamination may also cause irregular results.

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.

Disposable pipette tips, flasks or glassware are preferred, reusable glassware must be washed and thoroughly rinsed of all detergents before use.

As with most biological assays conditions may vary from assay to assay therefore **a fresh standard curve must be prepared and run for every assay.**

12. Performance Characteristics

12.1. Sensitivity

The sensitivity or minimum detectable dose of CD138 using this Diaclone Human CD138 ELISA kit was found to be **4.94ng/ml**. This was determined by adding 2 standard deviations to the mean OD obtained when the zero standard was assayed in 6 independent experiments.

12.2. Specificity

The assay recognizes both natural and recombinant human CD138. To define the specificity of this ELISA several proteins were tested for cross reactivity. There was no cross reactivity observed for any protein tested: IL-1β, IL-2 IL-4, IFNγ, IL-6, IL-6R, TRAIL, IL-7, IL-12 and IL-21.

12.3. Precision

Intra-assay
Reproducibility within the assay was evaluated in three independent experiments. Each assay was carried out with 6 replicates (3 duplicates) of samples containing different concentrations of CD138: 2 in human pooled Serum, 2 in Culture Media and 2 in Standard Diluent Buffer. Data below show the mean CD138 concentration and the coefficient of variation for each sample.
The calculated overall coefficient of variation was 6.2%.

Session	***Sample***	**Mean** CD138 ng/ml	**SD**	**CV%**
Session 1	***Sample 1***	194.01	17.20	**8.9**
	Sample 2	86.13	7.09	**8.2**
	Sample 3	195.00	16.10	**8.3**
	Sample 4	86.75	7.04	**8.1**
	Sample 5	294.13	31.93	**10.9**
	Sample 6	174.58	15.30	**8.8**
Session 2	***Sample 1***	171.65	3.94	**2.3**
	Sample 2	79.97	5.85	**7.3**
	Sample 3	173.60	5.80	**3.3**
	Sample 4	76.61	2.42	**3.2**
	Sample 5	242.90	15.80	**6.5**
	Sample 6	169.50	7.72	**4.6**
Session 3	***Sample 1***	183.07	11.48	**6.3**
	Sample 2	90.91	4.18	**4.6**
	Sample 3	191.82	10.77	**5.6**
	Sample 4	93.35	3.92	**4.2**
	Sample 5	264.00	14.66	**5.6**
	Sample 6	158.20	8.64	**5.5**

Inter-assay
Assay to assay reproducibility within one laboratory was evaluated in three independent experiments by two technicians. Each assay was carried out with 6 replicates (3 duplicates) of samples containing different concentrations of CD138: 2 in human pooled Serum, 2 in Culture Media and 2 in Standard Diluent Buffer. Data below show the mean CD138 concentration and the coefficient of variation for each sample.
The calculated overall coefficient of variation was 10.2%.

	Sample 1	***Sample 2***	***Sample 3***	***Sample 4***	***Sample 5***	***Sample 6***
Mean CD138 ng/ml	197	88	199	88	274	162
SD	21	8	19	9	27	19
CV%	**10.5**	**9.5**	**9.4**	**10.0**	**9.9**	**12.0**

12.4. Dilution Parallelism

In two independent experiments two spiked human serum samples with different levels of CD138 were analysed at different serial two fold dilutions (1:2 to 1:8) with two replicates each.
Recoveries ranged from 59 to 122% with an overall **mean recovery of 85%.**

12.5. Spike Recovery

The spike recovery was evaluated by spiking 2 concentrations of CD138 in human serum and culture medium in 3 separate experiments.
Recoveries ranged from 87 to 113% with an overall **mean recovery of 101%.**

12.6. Stability

Storage Stability
Aliquots of spiked serum and spiked medium were stored at –20°C, +2-8°C, room temperature (RT) and at 37°C and the CD138 level determined after 24h. There was no significant loss of CD138 reactivity during storage at +2-8°C, RT and 37°C.

Freeze-thaw Stability
Aliquots of spiked serum and spiked medium were stored frozen at –20°C and thawed up to 5 times and the CD138 level was determined. There was no significant loss of CD138 reactivity after 5 cycles of freezing and thawing.

12.7. Expected serum values

A panel of 40 human sera and 40 Plasma samples were tested for CD138. See results below:

Sample Matrix	Number of samples evaluated	Range (ng/ml)	Mean (ng/ml)	Standard deviation (ng/ml)
Serum	40	16.17-205.16	48.15	36.5
Plasma	40	15.7-68.9	31.62	15.3

13. Bibliography

1. Bartlett A. and al, Mol Cells. 2007 Oct 31;24(2):153-66.
2. Götte M and al, ScientificWorldJournal. 2003 Dec 11;3:1327-31.
3. Götte M, FASEB J. 2003 Apr;17(6):575-91.
4. Masouleh B. and al, J Immunol. 2009 Apr 15;182(8):4985-93.
5. Sun W. and al, Cell Mol Immunol. 2007 Jun;4(3):209-14.
6. Wijdenes J. and al, J Biol Regul Homeost Agents. Apr-Jun 2002;16(2):152-5.

14. Diaclone Human CD138 ELISA references

1. Aachmann-Andersen,N.J. et al.,Physiol Rep. 2018 Mar;6(5):e13573
2. Adepu, S. et al., Am J Physiol Renal Physiol.,2015; 309(2): F137-145
3. Andersen N.F. et al.,Br J Haematol.,2005;128:210-217
4. Annecke, T. et al., Br. J. Anaesth.,2010;104(4): 414-421
5. Benad-Mehner, P. et al., J Bone Oncol,,2014; 3(1): 18-24
6. Berthelsen, RE. Et al., Crit Care. 2019 Sep 5;23(1): 301
7. Bøe,O.W. et al.,Am J Case Rep.,2018 Feb 16;19:176-182.
8. Bogner-Flatz, V. et al., Mediators Inflamm. 2019; 2019: 8071619.
9. Bruegger D. et al., Am J Physiol Heart Circ Physiol, 2005; 289(5):H1993-9
10. Cekic, C. et al., Gastroenterol Res Pract.,2015: 850351
11. Celie, J. W. A. M. et al., Am J Physiol Renal Physiol.,2008; 294(1): F253-263.
12. Chappell, D. et al.,Crit Care,2014; 18(5): 538
13. Chappell, D.et al., Cardiovasc Res.,2009; 83(2): 388-396.
14. Cigliana, G. et al.,J Exp Clin Cancer Res., 2015;34(1):37
15. Connolly-Andersen, A.-M. et al.,Open Forum Infect Dis.,2014; 1(1): ofu027-
16. Dogne, S. et al., Diabetes,2016 ; 65(9): 2742-2753
17. Donati, A. et al., Crit Care,2014; 18(1): R33
18. Fisher, J. et al.,Intensive Care Med Exp. 2019 Jan 7;7(1):2.
19. Gandley, R. E. et al., PLoS One,2016; 11(6): e0157608
20. Gonzalez Rodriguez, E. et al.,Scand J Trauma Resusc Emerg Med. 2018 Nov 21;26(1):102.
21. Hahn, R. G. et al., PLoS One,2016; 11(10): e0164152
22. Haywood-Watson, R. J. et al.,PLoS One,2011;6(8): e23530
23. Hofmann-Kiefer, K. F. et al., Reproductive Sciences, 2013; 20:318-325
24. Iwata, H. et al., Haematologica,2004; 89(3): 368-370.
25. Janosi, J. et al., Haematologica,2004; 89(3): 370-371.
26. Jilani I. et al.,Int J Lab Hematol.,2009; 31:97-105
27. Joensuu H. et al., Cancer Res., 2002; 62(18): 5210-7
28. Johansson, L. et al., J Immunol.,2005; 175(1): 433-40
29. Johansson, P. I. et al., Ann Surg.,2016; 265(3): 597-603.
30. Johansson, P. I. et al., Front Physiol.2014; 5: 459
31. Johansson, P. I. et al., J Emerg Trauma Shock,2013;6(3):171-5
32. Johansson, P. I. et al., PLoS One,2015; 10(3): e0120914
33. Johansson, P. I. et al.,Crit Care,2011; 15(6): R272
34. Kamat, P. et al., J Inflamm.(Lond),2012; 9(1): 18.
35. Kim, J. M. et al.,Korean J Hematol.,2010; 45(2): 115-9
36. Kliment, C. R. et al., J. Biol. Chem.,2009; 284(6): 3537-3545.
37. Kristensen, I.B. et al., Blood (ASH Annual Meeting Abstracts),2012;120:3977
38. Kyrtsonis M-C. et al., Blood, 2004; 104(11): 4882
39. Kyrtsonis, M.-C. et al., Blood (ASH Annual Meeting Abstracts),2005;106(11): 3404.
40. le Poole, C. Y. et al.,Perit Dial Int.,2012; 32(3): 305-15
41. Liu, X.Y. et al.,Front Physiol., 2018 Feb 22;9:102.
42. Long, D. S. et al., BMJ Open,2016; 6(12): e011244.
43. Lovell R. et al.,Br J Haematol.,2005; 130:542-548
44. Mahtouk, K. et al., Blood,2007;109: 4914 – 4923
45. Maisnar V. et al., Neoplasma.2006;53:26-29
46. Meuwese, M. C. et al., J. Lipid Res.,2008; P800025-JLR200.

47. Molica, S. et al., Adv Hematol.,2009: 287974
48. Molica, S. et al., Leuk Lymphoma, 2006; 47(6): 1034-40.3
49. Mundt, F. et al., Biomed Res Int.,2014:419853
50. Mundt, F. et al.,PLoS One,2013; 8(8): e72030
51. Nault, J.-C. et al., Cancer Epidemiol. Biomarkers Prev.,2013; 22(8): 1343-1352.
52. Nemme, J. et al.,BMC Anesthesiol. 2017 Aug 22;17(1):107
53. Oda, K. et al., J Clin Med. 2019 Aug 27;8(9). pii: E1320.
54. Ostrowski, S. R. et al., Crit Care,2013; 17(1): R32
55. Ostrowski, S. R. et al., Crit Care,2015; 19:191
56. Ostrowski, S. R. et al., Scand J Trauma Resusc Emerg Med.,2012; 20: 27.
57. Passov, A. et al.,PLoS One. 2019 Aug 15;14(8): e0221010.
58. Peterfia, B. et al.,PLoS One,2012; 7(6): e39474
59. Qing, Q. et al., J Cell Mol Med.,2015;19(6): 1366-74
60. Rehm, M. et al., Circulation,2007; 116(17): 1896-1906.
61. Ronsholt, F. F. et al., BMC Infect Dis,,2015; 15: 388.
62. Rossi, J. F. et al., Br J Cancer,2009; 101(7): 1051-8.
63. Rovas, A. et al.,Crit Care. 2019 Jul 24;23(1):260.
64. Schaar, C. G. et al., Haematologica,2005; 90(10): 1437-1438.
65. Schierke, F. et al.,Sci Rep. 2017 Apr 13;7:46476.
66. Seidel C. et al., Blood, 2000; 95(2): 388 – 392
67. Sharma, M. et al., Blood Res., 2018; Sep 53(3): 205-209
68. Snoeijs, M. G. et al., Am J Physiol Renal Physiol.,2010; 299(5): F1134-1140.
69. Statkevicius, S. et al.,Crit Care. 2019 May 28; 23(1) :191.
70. Stensballe, J. et al., Anesth Analg. 2018 Oct;127(4): 920-927
71. Suwarto, S. et al.,J Infect Dis. 2017 Mar 15;215(6):992-999.
72. Szarvas T. et al.,Hum Pathol.,2014;45:674-682
73. Theocharis, A. D. et al., J Biol Chem.,2006; 281(46): 35116-28.
74. Thiara, A. S. et al, Perfusion,2010; 25(1): 9-16
75. Thiara, A. S. et al., Perfusion,2011; 26(2): 107-114
76. Vassilakopoulos T.P.et al.,Anticancer Res.,2005; 25:4743-4746
77. Vlahu, C. A. et al.,J. Am. Soc. Nephrol., 2012; 23: 1900-1908
78. Wang X. et al., Br J Cancer.,2014;111:1965-1976
79. Wolowiec, D. et al.,Mediators Inflamm., 2006(3): 42394.
80. Yamaguchi, M. et al.,Virulence. 2017 Nov 17;8(8):1516-1524.
81. Zausig, Y. A. et al.,Crit Care,2013; 17(5): R203
82. Zhu, J. et al., J Cereb Blood Flow Metab. 2018 Nov;38(11):1979-1992.
83. Zvibel, I. et al., Liver Int.,2009;29(2):208-12

15. Assay Summary

Total procedure length: 1h45min

Add 100µl of Samples, Control and diluted Standards and 50µl diluted Biotinylated Antibody

↓

Incubate 1 hour at room temperature

↓

Wash three times

↓

Add 100µl of diluted Streptavidin-HRP

↓

Incubate 30 min at room temperature

↓

Wash three times

↓

Add 100µl of TMB Substrate
Protect from light. Let the color develop for 12-15 min.

↓

Add 100µl of Stop Reagent

↓

Read Absorbance at 450 nm

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