Manual

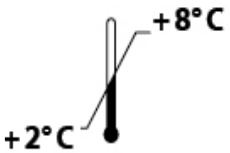
IDK® Kynurenine ELISA

For the determination of L-kynurenine in human EDTA plasma, serum and urine

For research use only

Valid from 2018-12-12

REF **KR7728**



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1. INTENDED USE

This Immundiagnostik AG assay is intended for the quantitative determination of L-kynurenine in human EDTA plasma, serum and urine. For research use only. Not for use in diagnostic procedures.

For rodent specimens (mouse, rat) and for cell culture supernatant and CSF we recommend our *IDK*® Kynurenine high sensitive ELISA KR3728.

2. MATERIAL SUPPLIED

Cat. No.	Label	Kit Components	Quantity
KR7728	PLATE	Microtiter plate, pre-coated	12 x 8 wells
KR7728	STD	Standards, ready-to-use (0, 0.1, 0.3, 1, 3, 10 µmol/l)	6 x 200 µl
KR7728	CTRL 1	Control, ready-to-use (see specification for range)	1 x 200 µl
KR7728	CTRL 2	Control, ready-to-use (see specification for range)	1 x 200 µl
KR0006.C.100	WASHBUF A	Wash buffer concentrate, 10x	2 x 100 ml
KR7728	AB	L-kynurenine antibody, lyophilised	1 x 1 vial
KR7728	CONJ	Conjugate concentrate, peroxidase-labelled	1 x 65 µl
KR0010.13	CONJBUF	Conjugate stabilizing buffer, ready-to-use	1 x 13 ml
KR7728	REABUF	Reaction buffer, ready-to-use	1 x 110 ml
KR7728	DER	Derivatisation reagent, lyophilised	4 x 25 mg
KR0008.07	DMSO	Dimethylsulfoxide (DMSO)	1 x 7 ml
KR0002.15	SUB	Substrate (tetramethylbenzidine), ready-to-use	1 x 15 ml
KR0003.15	STOP	Stop solution, ready-to-use	1 x 15 ml

For reorders of single components, use the catalogue number followed by the label as product number.

3. MATERIAL REQUIRED BUT NOT SUPPLIED

- Ultrapure water*
- Calibrated precision pipets and 10-1000 µl single use tips
- Foil to cover the microtiter plate
- Horizontal microtiter plate shaker
- Multi-channel pipets or repeater pipets
- Vortex
- Centrifuge, 3000 *g*
- Standard single use laboratory glass or plastic vials, cups, etc.
- Microtiter plate reader (required filters see chapter 6)

  * Immundiagnostik AG recommends the use of ultrapure water (water type 1; ISO 3696), which is free of undissolved and colloidal ions and organic molecules (free of particles > 0.2 µm) with an electrical conductivity of 0.055 µS/cm at 25 °C (≥18.2 MΩ cm).

4. STORAGE AND PREPARATION OF REAGENTS

- To run the assay more than once, ensure that reagents are stored at the conditions stated on the label. **Prepare only the appropriate amount necessary for each assay**. The kit can be used up to 4 times within the expiry date stated on the label.

- Reagents with a volume less than **100 µl** should be centrifuged before use to avoid loss of volume.

- **Preparation of the wash buffer**: The **wash buffer concentrate (WASHBUF A)** has to be diluted with ultrapure water **1:10** before use (100 ml WASHBUF A + 900 ml ultrapure water), mix well. Crystals could occur due to high salt concentration in the concentrate. Before dilution, the crystals have to be redissolved at room temperature or in a water bath at 37 °C. The **WASHBUF A** is stable at **2-8 °C** until the expiry date stated on the label. **Wash buffer** (1:10 diluted WASHBUF A) can be stored in a closed flask at **2-8 °C for 1 month**.

- **DMSO** crystallises at 2-8 °C. Before use, bring to room temperature to dissolve the crystals.

- Reconstitute the content of one vial of **derivatisation reagent (DER)** (25 mg) **with 1.5 ml DMSO.** Allow to dissolve for 10 minutes and mix thoroughly with a vortex-mixer. The derivatisation reagent must be **prepared immediately before use**. When more than one vial is to be used, combine the contents and mix prior to use. Discard any rest of the reagent after use. Please note: DMSO attacks all plastics but not polypropylene products and laboratory glass.

- The **lyophilised L-kynurenine antibody (AB)** is stable at **2-8 °C** until the expiry date stated on the label. Reconstitute the AB with **6 ml of wash buffer**. **L-kynurenine antibody** (reconstituted AB) **can be stored at 2-8 °C for 2 months.**
- **Preparation of the conjugate**: Before use, the conjugate concentrate has to be diluted **1:201** with **conjugate stabilizing buffer (CONJBUF)** (e.g. 60 µl CONJ + 12 ml CONJBUF, prepare only the required amount). The CONJ is stable at **2-8 °C** until the expiry date stated on the label. **Conjugate** (1:201 diluted CONJ) **can be stored at 2-8 °C for 1 month.**
- All other test reagents are ready-to-use. Test reagents are stable until the expiry date (see label) when stored at **2-8 °C.**

5. STORAGE AND PREPARATION OF SAMPLES

EDTA plasma, serum, urine

- In the samples L-kynurenine is stable for 72 h at 2-8 °C and at room temperature. For longer storage, store samples frozen at -20 °C.
- Samples are used **undiluted**.
- For sample preparation, a derivatisation reagent for derivatisation of L-kynurenine is added (see sample preparation procedure).

6. ASSAY PROCEDURE

Principle of the test

This ELISA is designed for the quantitative determination of L-kynurenine. The assay is based on the method of competitive enzyme linked immunoassays.

The sample preparation includes the addition of a derivatisation reagent for kynurenine derivatisation. Afterwards, the treated samples and a polyclonal L-kynurenine-antiserum are incubated in the wells of a microtiter plate coated with L-kynurenine-derivative (tracer). During the incubation period, the target L-kynurenine in the sample competes with the tracer, immobilised on the wall of the microtiter wells, for the binding of the polyclonal antibodies.

During the second incubation step, a peroxidase-conjugated antibody is added to each microtiter well to detect the anti-kynurenine antibodies. After washing away the unbound components, tetramethylbenzidine (TMB) is added as a peroxidase substrate. Finally, the enzymatic reaction is terminated by an acidic stop solution. The colour changes from blue to yellow, and the absorbance is measured in the photometer at 450 nm. The intensity of the yellow colour is

inverse proportional to the L-kynurenine concentration in the sample; this means, high L-kynurenine concentration in the sample reduces the concentration of tracer-bound antibodies and lowers the photometric signal. A dose response curve of absorbance unit (optical density, OD at 450 nm) vs. concentration is generated, using the values obtained from the standards. L-kynurenine, present in the samples, is determined directly from this curve.

Sample preparation procedure

Bring **all reagents and samples to room temperature** (15-30 °C) and mix well.

Derivatisation of standards, controls and samples is carried out in single analysis in vials (e.g. 1.5 ml polypropylene vials).

We recommend preparing one derivatisation per standard, control and sample and transferring it in duplicate determinations into the wells of the microtiter plate.

1.	Add **25 µl standard** (STD)/**control** (CTRL)/**sample** in the corresponding vials.
2.	Add **1 ml reaction buffer** (REABUF) into each vial (STD, CTRL, sample).
3.	Add **50 µl** of freshly prepared **derivatisation reagent** into each vial (STD, CTRL, sample) and **mix thoroughly** by repeated inversion or several seconds on a vortex mixer. Incubate for **45 min at room temperature** (15-30°C) on a **horizontal shaker**.

2 x 50 µl of the derivatised standards, controls and samples are used in the ELISA as duplicates.

Test procedure

Mark the positions of standards/controls/samples in duplicate on a protocol sheet.

Take as many microtiter strips (PLATE) as needed from the kit. Store unused strips covered with foil at 2-8 °C. Strips are stable until expiry date stated on the label.

4.	**Before use**, wash the wells **5 times** with **250 µl wash buffer**. After the final washing step, remove residual wash buffer by firmly tapping the plate on absorbent paper.

5.	For the analysis in duplicate take **2 x 50 µl** of the **derivatised standards/ controls/samples** out of the vials and add into the respective wells of the microtiter plate.
6.	Add **50 µl L-kynurenine antibody** into each well.
7.	Cover the strips tightly and incubate for **2 hours at room temperature** (15-30°C) on a **horizontal shaker.**
8.	Discard the content of each well and wash **5 times** with **250 µl wash buffer**. After the final washing step, remove residual wash buffer by firmly tapping the plate on absorbent paper.
9.	Add **100 µl conjugate** into each well.
10.	Cover the strips and incubate for **1 hour** at **room temperature** (15-30 °C) on a **horizontal shaker**.
11.	Discard the content of each well and wash **5 times** with **250 µl wash buffer**. After the final washing step, remove residual wash buffer by firmly tapping the plate on absorbent paper.
12.	Add **100 µl substrate** (SUB) into each well.
13.	Incubate for **10-15 min*** **at room temperature** (15-30 °C) in the **dark.**
14.	Add **100 µl stop solution** (STOP) into each well and mix well.
15.	Determine **absorption immediately** with an ELISA reader at **450 nm** against 620 nm (or 690 nm) as a reference. If no reference wavelength is available, read only at 450 nm. If the extinction of the highest standard exceeds the range of the photometer, absorption must be measured immediately at **405 nm** against 620 nm (690 nm) as a reference.

* The intensity of the colour change is temperature sensitive. We recommend observing the colour change and stopping the reaction upon good differentiation.

For automated ELISA processors, the given protocol may need to be adjusted according to the specific features of the respective automated platform. For further details please contact your supplier or Immundiagnostik AG.

7. RESULTS

The following algorithms can be used alternatively to calculate the results. We recommend using the 4 parameter algorithm.

1. **4 parameter algorithm**

   It is recommended to use a linear ordinate for optical density and a logarithmic abscissa for concentration. When using a logarithmic abscissa, the zero standard must be specified with a value less than 1 (e.g. 0.001).

2. **Point-to-point calculation**

   We recommend a linear ordinate for optical density and a linear abscissa for concentration.

3. **Spline algorithm**

   We recommend a linear ordinate for optical density and a linear abscissa for concentration.

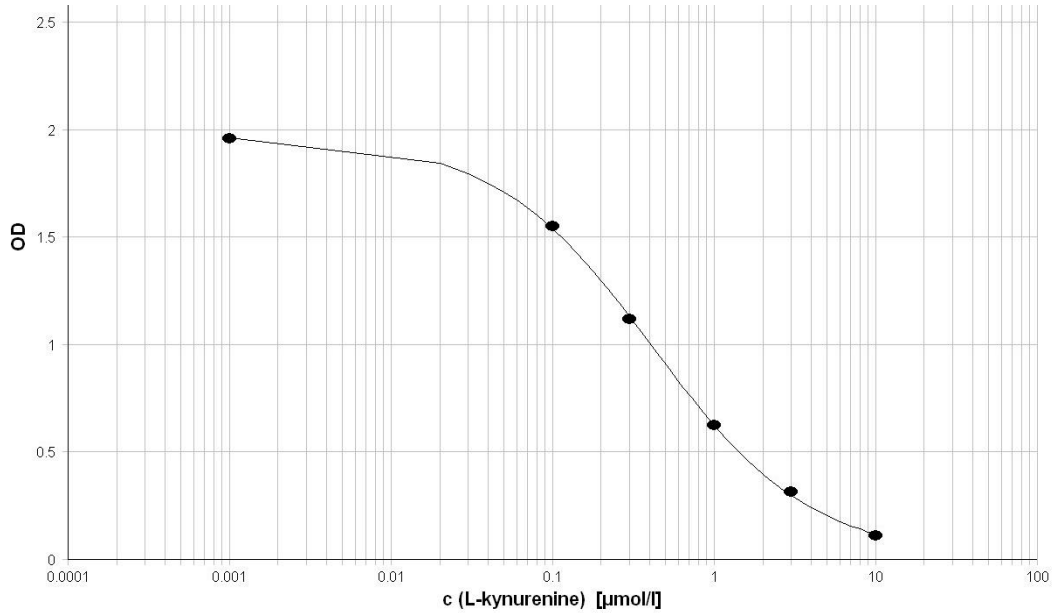
The plausibility of the duplicate values should be examined before the automatic evaluation of the results. If this option is not available with the program used, the duplicate values should be evaluated manually.

EDTA plasma, serum, urine

No factor is required.

In case another dilution factor has been used, multiply the obtained result by the dilution factor used.

In the following, an example of a calibration curve is given. Do not use it for the calculation of your results.



8. LIMITATIONS

Samples with concentrations above the measurement range must be diluted with reaction buffer and re-assayed. Please consider this dilution factor when calculating the results.

Samples with concentrations lower than the measurement range cannot be clearly quantified.

The upper limit of the measurement range can be calculated as:

highest concentration of the standard curve × *sample dilution factor to be used*

The lower limit of the measurement range can be calculated as:

LoB × *sample dilution factor to be used*

Limit of blank, LoB	0.076 µmol/l
Limit of detection, LoD	0.12 µmol/l
Limit of quantitation, LoQ	0.18 µmol/l

The evaluation was performed according to the CLSI guideline EP-17-A2. The specified accuracy goal for the LoQ was 15 % CV.

9. QUALITY CONTROL

Immundiagnostik AG recommends the use of external controls for internal quality control, if possible.

Control samples should be analysed with each run. Results, generated from the analysis of control samples, should be evaluated for acceptability using

appropriate statistical methods. The results for the samples may not be valid if within the same assay one or more values of the quality control samples are outside of the acceptable limits.

Reference Range

We recommend each laboratory to establish its own reference range.

10. PERFORMANCE CHARACTERISTICS

Precision and reproducibility

Intra-Assay (n = 14)

sample	L-kynurenine [µmol/l]	CV [%]
1	0.82	7.6
2	2.86	6.2

Inter-Assay (n = 8)

sample	L-kynurenine [µmol/l]	CV [%]
1	0.80	9.2
2	2.80	6.2

11. PRECAUTIONS

- All reagents in the kit package are for research use only.
- Human materials used in kit components were tested and found to be negative for HIV, Hepatitis B and Hepatitis C. However, for safety reasons, all kit components should be treated as potentially infectious.
- Kit reagents contain sodium azide or ProClin as bactericides. Sodium azide and ProClin are toxic. Substrates for the enzymatic color reactions are toxic and carcinogenic. Avoid contact with skin or mucous membranes
- The stop solution consists of sulfuric acid, which is a strong acid. Although diluted, it still must be handled with care. It can cause burns and should be handled with gloves, eye protection, and appropriate protective clothing. Any spill should be wiped up immediately with copious quantities of water. Do not breathe vapour and avoid inhalation.

12. TECHNICAL HINTS

- Do not interchange different lot numbers of any kit component within the same assay. Furthermore, we recommend not assembling wells of different microtiter plates for analysis, even if they are of the same batch.
- Control Samples should be analysed with each run.
- Reagents should not be used beyond the expiration date stated on the kit label.
- Substrate solution should remain colourless until use.
- To ensure accurate results proper adhesion of plate sealers during incubation steps is necessary.
- Avoid foaming when mixing reagents.
- Do not mix plugs and caps from different reagents.
- The assay should always be performed according to the enclosed manual.

13. GENERAL NOTES ON THE TEST AND TEST PROCEDURE

- The guidelines for laboratories should be followed.
- *IDK*® is a trademark of Immundiagnostik AG.
- Incubation time, incubation temperature, and pipetting volumes of the different components are defined by the producer. Any variation of the test procedure, which is not coordinated with the producer, may influence the results of the test. Immundiagnostik AG can therefore not be held responsible for any damage resulting from incorrect use.
- Warranty claims and complaints regarding deficiencies must be logged within 14 days after receipt of the product. The product should be sent to Immundiagnostik AG along with a written complaint.

14. REFERENCES

General Literature

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Publications using Immundiagnostik IDK® Kynurenine ELISA

Reichetzeder C, Heunisch F, Einem G von, et al. Pre-Interventional Kynurenine Predicts Medium-Term Outcome after Contrast Media Exposure Due to Coronary Angiography. *Kidney Blood Press Res.* 2017;42(2):244-256. doi:10.1159/000477222.

Used symbols:


Temperature limitation

Catalogue Number

For research use only

To be used with


Manufacturer

Contains sufficient for <n> tests

Lot number


Use by


Attention


Consult instructions for use

Consult specification data sheet