DRG® Serotonin FAST Elisa (EIA-5061)

Revised 9 Mar. 2011 rm (Vers. 2.1) **USA: RUO**

Please use only the valid version of the package insert provided with the kit.

This kit is intended for Research Use Only.

Not for use in diagnostic procedures.

1 INTENDED USE AND PRINCIPLE OF THE TEST

Enzyme Immunoassay for determination of Serotonin in serum, urine and platelets.

In the first step, Serotonin is quantitatively acylated.

The subsequent competitive ELISA kit uses the microtiter plate format. The antigen is bound to the solid phase of the microtiter plate. The acylated standards, controls and samples and the solid phase bound analyte compete for a fixed number of antiserum binding sites. After the system is in equilibrium, free antigen and free antigen-antiserum complexes are removed by washing. The antibody bound to the solid phase is detected by an anti-rabbit IgG-peroxidase conjugate using TMB as a substrate. The reaction is monitored at 450 nm.

Quantification of unknown samples is achieved by comparing their absorbance with a reference curve prepared with known standard concentrations.

2 ADVICE ON HANDLING THE TEST

2.1 Reliability of the test results

In order to assure a reliable evaluation of the test results it must be conducted according to the instructions included and in accordance with current rules and guidelines (GLP, RILIBÄK, etc.). Special attention must be paid to control checks for precision and correctness during the test; the results of these control checks have to be within the norm range. In case of significant discrepancies between the pre-set assay characteristics of this test and the actual results please contact the manufacturer of the test kit for further instructions.

It is recommended that each laboratory establishes its own reference intervals. The values reported in this test instruction are only indicative.

2.2 Complaints

In case of complaints please submit to the manufacturer a written report containing all data as to how the test was conducted, the results received and a copy of the original test printout. Please contact the manufacturer to obtain a reclamation form and return it completely filled in to the manufacturer.

2.3 Warranty

This test kit was produced according to the latest developments in technology and subjected to stringent internal and external quality control checks. Any alteration of the test kit or the test procedure as well as the usage of reagents from different charges may have a negative influence on the test results and are therefore not covered by warranty. The manufacturer is not liable for damages incurred in transit.

2.4 Disposal

Residual substances and/or all remaining chemicals, reagents and ready for use solutions, are special refuse. The disposal is subject to the laws and regulations of the federation and the countries. About the removal of special refuse the responsible authorities or refuse disposal enterprises inform. The disposal of the kit must be made according to the national official regulations. Legal basis for the disposal of special refuse is the cycle economic- and waste law.

The appropriate safety data sheets of the individual products are available upon request. The safety data sheets correspond to the standard: ISO 11014-1.

2.5 Interference

Do not mix reagents and solutions from different lots. Consider different transport and storage conditions. Inappropriate handling of test samples or deviations from the test regulation can the results affect. Use no kit components beyond the expiration date. Avoid microbiological contamination of the reagents and the washing water. Consider incubation periods and wash references.

2.6 Precautions

Observe the incubation periods and washing instructions. Never pipette by mouth and avoid contact of reagents and specimens with skin. No smoking, eating or drinking in areas where samples or kit test tubes are handled. When working with kit components or samples, always wear protective gloves and wash your hand thoroughly as soon as you have finished the work. Avoid spraying of any kind.
Avoid any skin contact with reagents. Use protective clothing and disposable gloves.
All steps have to be performed according to the protocol. Optimal test results are only obtained when using calibrated pipettes. Sodium azide could react with lead and copper tubes and may form highly explosive metal azide. When clearing up, rinse thoroughly with large volumes of water to prevent such formation.

All reagents of this testkit which contain human or animal serum or plasma have been tested and confirmed negative for HIV I/II, HbsAg and HCV by FDA approved procedures.

All reagents, however, should be treated as potential biohazards in use and for disposal.

3 STORAGE AND STABILITY

Store the reagents - **except of the Acylation Concentrate** – at 2 - 8 °C until expiration date. The Acylation Concentrate should be stored at room temperature. Do not use components beyond the expiry date indicated on the kit labels.

4 CONTENTS OF THE KIT

REAC-TUBES	Reaction Tubes*)	2 x 50	ready for use
WASH-CONC 50x	Wash Buffer Concentrate	1 x 20 mL	concentrate, dilute content with dist. water to a final volume of 1000 mL
CONJUGATE	Conjugate	1 x 12 mL	ready for use, anti-rabbit IgG conjugated with peroxidase
SUBSTRATE	Substrate	1 x 12 mL	ready for use, containing a solution of tetramethylbenzidine (TMB)
STOP-SOLN	Stop Solution	1 x 12 mL	ready for use, containing 0.25 M H_2SO_4
TLI SER 5-HIAA	Serotonin-5-HIAA Microtiter Strips	1 x 96 wells	12 strips, 8 wells each, break apart, pre-coated
STANDARD A	Standard A	1 x 4 mL	ready for use
STANDARD B	Standard B	1 x 4 mL	ready for use
STANDARD C	Standard C	1 x 4 mL	ready for use
STANDARD D	Standard D	1 x 4 mL	ready for use
STANDARD E	Standard E	1 x 4 mL	ready for use
STANDARD F	Standard F	1 x 4 mL	ready for use
SER-AS	Serotonin Antiserum	1 x 12 mL	from rabbit, ready for use, blue coloured, blue screw cap
ACYL-BUFF	Acylation Buffer	1 x 55 mL	ready for use
ACYL-REAG	Acylation Reagent	1 x 3 mL	ready for use
CONTROL 1	Control 1	1 x 4 mL	ready for use
CONTROL 2	Control 2	1 x 4 mL	ready for use

***)** Instead of the reaction tubes it is also possible to use 48 wells macrotiter plates for the sample preparation and acylation (please refer to 6.2). These plates are available upon request (EIA-5061-PLA).

4.1 Additional materials and equipment required but not provided in the kit

- Calibrated variable precision micropipettes (e.g. 10-100 µL / 100-1000µL)
- Microtiter plate washing device
- ELISA reader capable of reading absorbance at 450 nm and 620 or 650 nm
- Absorbent material (paper towel)

– Distilled water
– Vortex mixer

The assay can be performed with or without shaking. If a shaker is used, it should have the following characteristics: shaking amplitude 3mm; approx. 600 rpm.

5 SAMPLE COLLECTION AND STORAGE

Repeated freezing and thawing of the samles should be avoided.

Serum

Haemolytic and especially lipemic samples should not be used with this assay.

Storage: up to 6 hours at 2 - 8°C; for longer periods (up to 6 months) at - 20°C.

Urine

Spontaneous or 24-hour urine, collected in a bottle containing 10-15 mL of 6 M HCl can be used.

Storage: for longer periods (up to 6 months) at -20°C. Avoid exposure to direct sunlight.

Plasma

More than 98 percent of the circulating serotonin is located in the platelets and is released during blood clotting. Blood must be collected by venipuncture in plastic tubes containing EDTA or Citrate.

Platelet-rich plasma (PRP)

To obtain platelet-rich plasma (PRP) the samples are centrifuged for 10 minutes at room temperature (200 x g). Transfer the supernatant to another tube and count the platelets.

Platelets

The platelet pellet is obtained by adding 800 µL of physiological saline to 200 µL of PRP (containing between 350,000 – 500,000 platelets/µL) and centrifugation (4,500 x g, 10 minutes at 4°C). The supernatant is then discarded.

200 µL of dist. water is added to the pellet and mixed thoroughly on a vortex mixer. This suspension can be stored frozen for several weeks at < -20°C.

After thawing of the frozen samples, centrifuge at 10,000 x g for 2 minutes at room temperature.

25 µL of the supernatant is used for the acylation reaction.

- For the determination of Serotonin in **platelet-free plasma** and **cerebrospinal fluid** the Serotonin Research ELISA should be used.

6 TEST PROCEDURE FOR SERUM, URINE AND PLATELETS

Allow all reagents and samples to reach room temperature.

The measurement in duplicates is recommended.

6.1 Preparation of reagents

Wash Buffer

Dilute the 20 mL Wash Buffer Concentrate with distilled water to a final volume of 1000 mL.

Storage: up to 6 months 4–8°C

Acylation Reagent

The Acylation Reagent has a freezing point of 18.5°C. To ensure that the Acylation Reagent is liquid when being used, it must be ensured that the Acylation Reagent has reached room temperature and forms a homogeneous, crystal-free solution before being used. Alternative the Acylation Reagent can be stored at room temperature (20 – 25°C) separate from the other kit components (please refer to 3.).

6.2 Sample preparation and acylation of serum, urine and platelets

1. Pipette **25 µL** of **standards**, **25 µL** of **controls,** and **25 µL** of **serum, urine** or **platelets** into the respective **Reaction Tubes**.
2. Add **500 µL** of **Acylation Buffer** to all tubes.
3. Add **25 µL** of **Acylation Reagent** to all tubes.
4. **Mix thoroughly** and **incubate** for **15 min** at **RT** (20-25°C).

Take **25 µL of the prepared standards, controls and samples** for the Serotonin ELISA

6.3 Serotonin ELISA

The usage of a shaker is not mandatory. The alternative protocol without shaker is highlighted in italic and shaded in grey.

1. Pipette **25 µL** of the **acylated standards, controls and samples** into the appropriate wells of the **Serotonin Microtiter Strips.**
2. Pipette **100 µL** of the **Serotonin Antiserum** into all wells.
3. Incubate **30 min at RT** (20-25°C) on a shaker (approx. 600 rpm).

   Without usage of a shaker: *shake the* ***Serotonin Microtiter Strips*** *shortly by hand and incubate for* ***1 hour*** *at* ***RT*** *(20-25°C).*
4. Discard or aspirate the contents of the wells and **wash** each well **3 times** thoroughly with **300 µL Washbuffer**. Blot dry by tapping the inverted plate on absorbent material.
5. Pipette **100 µL** of the **Conjugate** into all wells.
6. Incubate for **15 min** at **RT** (20-25°C) on a shaker (approx. 600 rpm).

   Without usage of a shaker: *incubate for* ***15 min at RT*** *(20-25°C).*

7. Discard or aspirate the contents of the wells and **wash** each well **3 times** thoroughly with **300 µL Washbuffer**. Blot dry by tapping the inverted plate on absorbent material.
8. Pipette **100 µL** of the **Substrate** into all wells.
9. Incubate for **15 ± 2 min at RT** (20-25°C) on a shaker (approx. 600 rpm).

Without usage of a shaker: *incubate for **15 min ± 2 min** at **RT** (20-25°C).*

Avoid exposure to direct sun light!

10. Add **100 µL** of the **Stop Solution** to each well and shake the microtiter plate to ensure a homogeneous distribution of the solution.
11. **Read** the absorbance of the solution in the wells within 10 minutes, using a microplate reader set to **450 nm** and a reference wavelength between 620 nm and 650 nm.

7 CALCULATION OF RESULTS

	Concentration of the standards					
Standard	**A**	**B**	**C**	**D**	**E**	**F**
Serotonin (ng/mL)	0	15	50	150	500	2 500
Serotonin (nmol/L)	0	85.1	284	851	2 840	14 175
Conversion:	Serotonin (ng/mL) x 5.67 = Serotonin (nmol/L)					

The calibration curve is obtained by plotting the absorbance readings (calculate the mean absorbance) of the standards (linear, y-axis) against the corresponding standard concentrations (logarithmic, x-axis).

Use a non-linear regression for curve fitting (e.g. spline, 4- parameter, akima).

The concentrations for **urine** and **serum samples** can be read directly from the calibration curve.

Calculation of serotonin in platelets

The content of serotonin in platelets is referred to 10^9 platelets.

Illustrative example:

Measured Serotonin concentration: 100 ng/mL

Number of the platelets in the PRP: 300 000 / µL = 0.3 x 10^9 platelets/mL with serotonin content of 100 ng.

The resulting serotonin content in the platelets is:

333 ng/ 10^9 platelets (100 ng serotonin x 1.0 x 10^9 /0.3 x 10^9)

7.1 Quality control

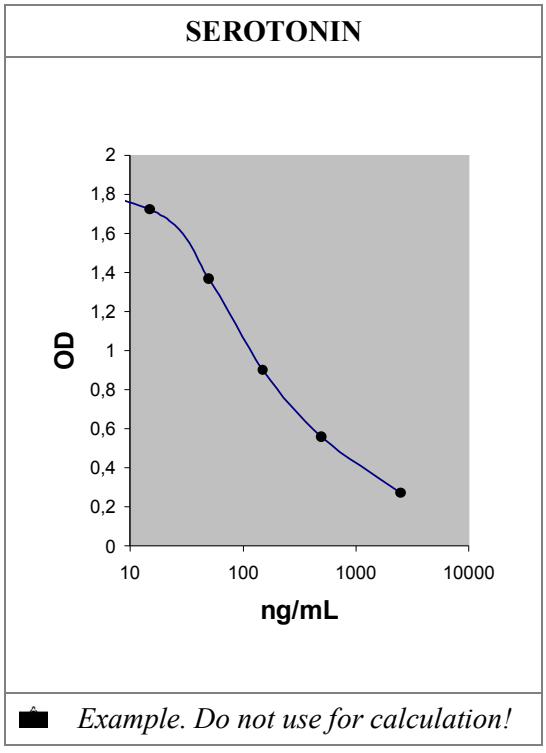
It is recommended to use control samples according to state and federal regulations. Use controls at both normal and pathological levels. The kit, or other commercially available, controls should fall within established confidence limits. The confidence limits of the kit controls are printed on the QC-Report.

7.2 Calibration

The binding of the antisera and the enzyme conjugates and the activity of the enzyme used are temperature dependent, and the extinction values may vary if a thermostat is not used. The higher the temperature, the higher the extinction values will be. Corresponding variations also apply to the incubation times. The optimal temperature during the Enzyme Immunoassay is between 20-25°C.

In case of overflow, read the absorbance of the solution in the wells within 10 minutes, using a microplate reader set to 405 nm

7.3 Typical calibration curve:



Example. Do not use for calculation!