Mouse/Rat Obestatin ELISA

For the quantitative determination of obestatin in mouse/rat serum.

For Research use Only. Not For Use In Diagnostic Procedures.

Catalog Number: 48-OBEMS-E01
Size: 96 Wells
Introduction

Obestatin is a 23 amino acid residues peptide isolated from the rat stomach. The peptide shares the precursor with a food intake stimulating peptide, ghrelin, but possesses reducing effects on food intake, gut motility and body weight (1). With the use of an antiserum directed against the mouse/rat obestatin, obestatin immunoreactivity (irOBS) was detected in cells of the gastric mucosa and myenteric plexus and in Leydig cells of the testis in Sprague–Dawley rats. Double labeling of myenteric plexus with antisera against obestatin and choline acetyltransferase (ChAT) revealed that nearly all irOBS neurons were ChAT positive and vice versa (2). Obestatin (100nM) added to dissociated and cultured rat cerebral cortical neurons elevated cytosolic calcium concentrations [Ca+2]i in a population of cortical neurons (2). Intracerebroventricular administration of obestatin inhibited water drinking in ad libitum fed and watered rats, and in food and water deprived animals. In addition, obestatin inhibited angiotensin II-induced water drinking in animals provided free access to water and food (3). Obestatin peptides had no effect on insulin sensitivity as revealed by hypoglycaemic response when co-administered with insulin, supporting a role of obestatin in regulating metabolism through changes of appetite, but indicating no direct actions on glucose homeostasis or insulin secretion (4). It is supposed that in rats the effects of obestatin on food intake may be secondary to an action of the peptide to inhibit water drinking (3). Recently, it is reported affording cardioprotection to ischemic-reperfused isolated rat heart, inhibiting apoptosis in culture of similarly stressed cardiomyocytes (5) and inhibiting dopamine release in rat hypothalamus (6).

The obestatin concerning study for energy homeostasis and body weight regulation could be expected to have a large development in the future. The mouse/rat obestatin EIA assay kit developed by our laboratory can be used for direct determination of serum obestatin level’s variations and will be a useful tool for further development of obestatin research.

Contents

- The assay kit can measure mouse/rat obestatin within the range of 0.082-20ng/mL.
- The assay completes within 18-20h. + 1.5 h.
- With one assay kit, 41 samples can be measured in duplicate.
- Test sample: mouse or rat serum. Sample volume: 25 µL.
- The 96-well plate of this kit is consists of 8-well strips, so that divided use by strips is possible at user’s option.
- Intra-assay CV ( % ) 3.7 ~ 6.9 (mouse serum), 3.4~6.7 (rat serum).
- Inter-assay CV ( % ) 4.5 ~ 8.4 (mouse serum), 8.1~10.8 (rat serum).

Store all the components at 2-8°C.

The expiry date is stated on the package.

1) Antibody Coated Plate
2) Standard
3) Labeled Antigen
4) Specific Antibody
5) SA-HRP Solution
6) TMB Substrate
7) Reaction Stopping Solution
8) Buffer Solution
9) Concentrated Washing Solution
10) Adhesive Foil
### Characteristics

This EIA kit is used for quantitative determination of obestatin in mouse/rat serum samples. It has various advantages, such as highly specific and sensitive quantification, no influences with other body fluids or physiological active substances and unnecessity of sample pretreatment. Mouse/rat obestatin standard of this kit is a highly purified synthetic product (purity: higher than 99%).

**< Specificity >**

The EIA kit shows cross-reactivity of 100% to mouse/rat obestatin, 118.6% to mouse/rat obestatin (11-23)-NH₂, 0.5% to mouse/rat obestatin (1-23)-OH and less than 0.39% to human/mouse/rat obestatin (1-10) and no cross-reactivity to human obestatin, human obestatin (11-23))-NH₂, and mouse/rat ghrelin and mouse/rat des-octanoyl ghrelin.

**< Assay Principle >**

This EIA kit for determination of obestatin in mouse/rat serum samples is based on a competitive enzyme immunoassay using the combination of highly specific antibody to mouse/rat obestatin and biotin–avidin affinity system. The 96 wells plate is coated with goat anti rabbit IgG, to which biotinylated mouse/rat obestatin, mouse/rat obestatin standard or samples and rabbit anti mouse/rat obestatin antibody are added for competitive immunoreaction. After incubation and plate washing, horse radish peroxidase (HRP) labeled streptavidin (SA) is added, so that HRP labeled SA-biotinylated mouse/rat obestatin-antibody complex is formed on the surface of the wells. Finally, HRP enzyme activity is determined by 3,3',5,5'-Tetramethylbenzidine (TMB) and the concentration of mouse/rat obestatin is calculated.

### Composition

<table>
<thead>
<tr>
<th>Component</th>
<th>Form</th>
<th>Quantity</th>
<th>Main Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Antibody Coated Plate</td>
<td>microtiter plate</td>
<td>1 plate (96 wells)</td>
<td>Goat anti rabbit IgG</td>
</tr>
<tr>
<td>2 Standard</td>
<td>lyophilized powder</td>
<td>1 vial (20ng)</td>
<td>Synthetic mouse/rat obestatin</td>
</tr>
<tr>
<td>3 Labeled Antigen</td>
<td>lyophilized powder</td>
<td>1 vial</td>
<td>Biotinylated mouse/rat obestatin</td>
</tr>
<tr>
<td>4 Specific Antibody</td>
<td>liquid</td>
<td>1 bottle (6 mL)</td>
<td>Rabbit anti mouse/rat obestatin antibody</td>
</tr>
<tr>
<td>5 SA-HRP Solution</td>
<td>liquid</td>
<td>1 bottle (12 mL)</td>
<td>HRP labeled streptavidin</td>
</tr>
<tr>
<td>6 TMB Substrate</td>
<td>liquid</td>
<td>1 bottle (12 mL)</td>
<td>3,3',5,5'-Tetramethylbenzidine (TMB)</td>
</tr>
<tr>
<td>7 Reaction Stopping Solution</td>
<td>liquid</td>
<td>1 bottle (12 mL)</td>
<td>1M H₂SO₄</td>
</tr>
<tr>
<td>8 Buffer Solution</td>
<td>liquid</td>
<td>1 bottle (25 mL)</td>
<td>BSA containing saline buffer</td>
</tr>
<tr>
<td>9 Concentrated Wash Solution</td>
<td>liquid</td>
<td>1 bottle (25 mL)</td>
<td>Concentrated saline</td>
</tr>
<tr>
<td>10 Adhesive Foil</td>
<td></td>
<td>3 sheets</td>
<td></td>
</tr>
</tbody>
</table>
**Method**

< Equipment required >

1. Photometer for microtiter plate (plate reader), which can read extinction 2.5 at 450nm
2. Washing device for microtiter plate and dispenser with aspiration system
3. Micropipettes, multi-channel pipettes for 8 wells or 12 wells and their tips
4. Test tubes (glass or polypropylene) for preparation of standard solution
5. Graduated cylinder (500mL or 1,000mL)
6. Distilled or deionized water
7. Lint free paper towel
8. A microplate shaker if necessary

< Preparatory work >

1. Preparation of standard solution:
   Reconstitute the mouse/rat obestatin Standard (lyophilized mouse/rat obestatin 20ng/vial) with 1mL of buffer solution, which affords 20ng/mL standard solution. The reconstituted standard solution (0.1mL) is diluted with 0.2mL of buffer solution that yields 6.667ng/mL standard solution. Repeat the same dilution to make each standard solution of 2.222, 0.741, 0.247, and 0.082ng/mL. Buffer solution is used as 0ng/mL.

2. Preparation of labeled antigen solution:
   Reconstitute Labeled Antigen with 6mL of buffer solution.

3. Preparation of washing solution:
   Dilute 25mL of Concentrated Washing Solution to 500mL with distilled or deionized water.

4. Other reagents are ready for use.
1. Before starting the assay, bring all the reagents except the samples to room temperature (20-25°C). The samples should be kept in an ice-bath after thawing.

2. Add 300 µl of washing solution to each well and keep it for at least 30 seconds, then aspirate or decant the washing solution in the wells. **Invert the plate and tap it firmly on a lint free paper towel to ensure most of the residual washing solution has been blotted away.**

3. Fill 50 µl of labeled antigen solution into each well first, then introduce 25 µl of each of the standard solutions (0, 0.082, 0.247, 0.741, 2.222, 6.667, 20 ng/ml) or samples and finally add 50 µl of mouse/rat obestatin antibody into each well.

4. Cover the plate with adhesive foil and incubate it at 4°C for 18 - 20 hours (no shaking).

5. After incubation, take off the Adhesive foil, aspirate the contents, then add 300 µl of washing solution to each well and aspirate. Repeat the wash step for a total of five times with approximately 300 µl/well of washing solution each time and finally **invert the plate and tap it firmly on a lint free paper towel to ensure most of the residual washing solution has been blotted away.**

6. Pipette 100 µl of SA-HRP Solution into each well.

7. Cover the plate with Adhesive Foil and incubate at room temperature for 1 hour (no shaking).

8. Take off the Adhesive Foil, aspirate and wash the wells five times as in step 5.

9. Add 100 µl of TMB Substrate into each well; cover the plate with Adhesive Foil and keep it for 30 minutes (still or shaking) at room temperature under light proof conditions (please refer to V. Notes 7 for more information).

10. Add 100 µl of Reaction Stopping Solution into each well to stop color reaction.

11. Read the optical absorbance of the wells at 450 nm.

12. Calculate mean optical density values of wells containing standard solutions or their bound percentage (B/B₀%) to B₀ wells (0 ng/ml standard as B₀) and plot a standard curve on semi-logarithmic graph paper (abscissa: concentrations of standard; ordinate: optical density or B/ B₀%). Use the average optical density or B/ B₀% of each sample to determine the corresponding value by simple interpolation from the standard curve.
Notes

1. It is strongly recommended that protease inhibitors (e.g. aprotinin or some cocktail must be added to serum sample as soon as possible after separation. If the sample is tested later, they should be divided into test tubes in small amount and frozen below – 30°C (for long term storage, it is recommended the sample should be stored in a – 80°C deep freezer). Avoid repeated freezing and thawing of samples. **During thawing of frozen samples before assay, they should be kept in an ice bath and used within 60 minutes.**

2. Standard and labeled antigen solutions should be prepared immediately before use. The plate can be used twice separately. In that case, the rests of the reconstituted standard and labeled antigen solution should be stored below -30°C but others at 4°C and used in 2 weeks.

3. As pipetting operations may affect precision of the assay, pipette standard solutions or samples precisely into each well of plate. In addition, use a new tip for each sample or standard solution and for each standard diluting process to avoid cross contamination.

4. Perform all the determination in duplicate or more.

5. Always make a standard curve when testing samples because the assay conditions may be different to each other that influence the coloring levels and result precisions.

6. Coloring reaction should be carried out under the light proof condition.

7. **TMB Substrate solution should be equilibrated at least 1 hour at room condition to room temperature before applying.** It is supposed that low or high temperature of TMB Substrate solution which if added to plate may affect the color levels remarkably.

8. Read optical densities of reaction solution in wells immediately after the reaction stopping.

9. If multiple assay kits will be used, please run all assay kits always on consistent conditions (e.g. incubation time, temperature, shake speed etc.) to get optimal inter-assay performance.

10. Protect reagents from strong light (e.g. direct sunlight) during storage and assay.

11. **Satisfactory performance of the assay will be guaranteed only when reagents are used from combination pack with identical lot number.**
## Performance Characteristics

### Standard curves of mouse/rat obestatin EIA

![Standard curves of mouse/rat obestatin EIA](image)

- **Mouse/rat obestatin, ng/mL**
- **O.D. (450nm)**
- **B/Bo%**

### Precision and reproducibility

- **Intra-assay CV (%):** mouse serum 3.7 ~ 6.9; rat serum 3.4~6.7
- **Inter-assay CV (%):** mouse serum 4.5 ~ 8.4; rat serum 8.1~10.8

### Assay range and Sensitivity

- **Range:** 0.082 – 20 ng/mL;
- **Sensitivity =** \((2 \times \text{SD}_{0.082\text{ng/mL}} - 0.082\text{ng/mL})/(\text{O.D.}_{0\text{ng/mL}} - \text{O.D.}_{0.082\text{ng/mL}})\)

### Analytical recovery

- **Mouse serum:** 102.7~108.9% (n=4); **Rat serum:** 85.7~95.7 (n=3)

### Dilution test

Satisfactory dilution characteristics were shown with mouse and rat serum.
 Stability and Storage

< Storage > Store all the components at 2 to 8°C.
< Shelf life > Kit is stable under the condition for 24 months from the manufacturing date. The expiry date is stated on the label of package.
< Package > For 96 tests per one kit including standards.

References

1. Zhang JV, Ren PG et al: **Obestatin, a peptide encoded by the ghrelin gene, opposes ghrelin’s effects on food intake.** Science 310:996-999, 2005