

## Product Information

### Anti-MCH

produced in rabbit, IgG fraction of antiserum

Catalog Number **M8440**

Synonym: Anti-Melanin-Concentrating Hormone

### Product Description

Anti-MCH is produced in rabbit using as immunogen synthetic human MCH conjugated to keyhole limpet hemocyanin (KLH). The MCH sequence is identical in many species including rat, mouse, and pig. Whole antiserum is purified to provide an IgG fraction of antiserum.

Anti-MCH recognizes human MCH. Applications include the detection of MCH by radioimmunoassay. Anti-MCH does not cross-react with  $\alpha$ -MSH,  $\beta$ -MSH,  $\gamma$ -MSH,  $\alpha$ -endorphin,  $\beta$ -endorphin, human ACTH (1-39), and ACTH (1-24).

Melanin-concentrating hormone (MCH), a cyclic neuropeptide isolated initially from fish pituitary gland, plays a central role in regulating adaptive changes in pigmentation in fish, amphibians, and reptiles.<sup>1</sup> In fish, MCH regulates skin color by promoting melanin granule aggregation in melanocytes, while in amphibians and reptiles it induces opposing actions such as melanin dispersion. The structure of MCH is highly conserved among species. In mammals, MCH is a 19-amino acid residue cyclic neuropeptide, encoded by the precursor pro-melanin concentrating hormone (PMCH). Several lines of evidence indicate a critical role for MCH as a neurotransmitter or neuromodulator in a variety of physiological functions, in particular central control of feeding behavior.

MCH and its receptor are mainly expressed in the hypothalamus, a region involved in energy balance and food intake.<sup>2-4</sup> MCH perikarya is confined largely to the lateral hypothalamus area (LHA) and the adjacent zona incerta with extensive neuronal projections throughout the brain, including the neurohypophysis. MCH is detected in basal ganglia, neocortex, cerebellum, thymus, brown adipose tissue, duodenum, and testis.

MCH mRNA is overexpressed and up-regulated during fasting in the hypothalamus of *ob/ob* mice as well as rats.<sup>5,6</sup> Injection of MCH into the lateral ventricles in rats promote increased food consumption.<sup>6,7</sup> In addition, knockout mice lacking MCH gene are lean and hypophagic and show an increase in metabolic rate.<sup>8</sup> In contrast, overexpression of MCH in transgenic mice leads to obesity and insulin resistance.<sup>9</sup> In peripheral tissues MCH also stimulates the release of leptin from rat adipocytes.<sup>10</sup> MCH and components of MCH signaling pathways are therefore very attractive as potential anti-obesity drug targets.

Two different types of MCH receptors have been identified, a splice variant of the orphan G-protein coupled receptor (GPCR), SLC-1/GPR24, also referred to as MCHR1, and MCHR2.<sup>11-15</sup> MCHR2 has an expression pattern similar to MCHR1; it binds MCH with high affinity and is specifically activated by nanomolar concentrations of MCH.<sup>12-14</sup>

### Reagent

Solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

### Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

### Storage/Stability

For continuous use, the product may be stored at 2-8 °C for up to one month. For prolonged storage, freeze in working aliquots at -20 °C. Repeated freezing and thawing, or storage in frost-free freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

### Product Profile

For radioimmunoassay (2<sup>nd</sup> antibody and polyethylene glycol method), a minimum working antibody dilution of 1:30,000 is recommended using 5-7 pg/tube of <sup>125</sup>I-MCH.

**Sensitivity:** ≤ 5 pg/tube of MCH

**Affinity constant Ka:** at least 1x10<sup>9</sup> L/M.

Peptide	%Cross-reactivity at 50% binding
MCH	100
α-MSH	≤0.01
β-MSH	≤0.01
γ-MSH	≤0.01
β-Endorphin	≤0.01
α-Endorphin	≤0.01
ACTH (1-39), human	≤0.01
ACTH (1-24)	≤0.01

**Note:** In order to obtain the best results using different techniques and preparations, we recommend determining the optimal working dilutions by titration.

### References

1. Kawauchi, H., et al., *Nature*, **305**, 321 (1983).
2. Bittencourt, J. C., et al., *J. Comp. Neurol.*, **319**, 218 (1992).
3. Elmquist, J. K., et al., *Neuron*, **22**, 221 (1999).
4. Hervieu, G.J., et al., *Eur. J. Neurosci.*, **12**, 1194 (2000).
5. Presse, F., et al., *Neurosci.*, **71**, 735 (1996).
6. Qu, D., et al., *Nature*, **380**, 243 (1996).
7. Tritos, N. A., et al., *Diabetes*, **47**, 1687 (1998).
8. Shimada, M., et al., *Nature*, **396**, 670 (1998).
9. Ludwig, D. S., et al., *J. Clin. Invest.*, **107**, 379 (2001).
10. Bradley, R. L., et al., *Diabetes*, **49**, 1073 (2000).
11. Chambers, J., et al., *Nature*, **400**, 261 (1999).
12. Saito, Y., et al., *Nature*, **400**, 265 (1999).
13. Hill, J., et al., *J. Biol. Chem.*, **276**, 20125 (2001).
14. Sailer, A.W., et al., *Proc. Natl. Acad. Sci. USA*, **98**, 7564 (2001).
15. An, S., et al., *Proc. Natl. Acad. Sci. USA*, **98**, 7576 (2001).

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