

Product Specification Sheet

**Hemoglobin (Hb; non-glycated) Protein**

□ **Cat.** HEMG15-N-100

Purified human hemoglobin

**SIZE:** 100 mg

Hemoglobin (also spelled haemoglobin and abbreviated Hb or Hgb) is the iron-containing oxygen-transport metalloprotein in the red blood cells of vertebrates and the tissues of some invertebrates. In mammals, the protein makes up about 97% of the red blood cell's dry content, and around 35% of the total content (including water). Hemoglobin transports oxygen from the lungs or gills to the rest of the body where it releases the oxygen for cell use. Deoxyhemoglobin is the form of hemoglobin without the bound oxygen.

In adult humans, the most common hemoglobin type is a tetramer (which contains 4 subunit proteins) called hemoglobin A, consisting of two non-covalently bound  $\alpha$  and two  $\beta$  subunits ( $\alpha_2\beta_2$ , 141 aa and 146 aa, ~17 Kda, 68 kda for tetramer).

Glycated hemoglobin (hemoglobin A1c, HbA1c, A1C, or Hb1c; sometimes also HbA1c) is formed in a non-enzymatic glycation pathway by hemoglobin's exposure to plasma glucose. A1c serves as a marker for average blood glucose levels over the previous months prior to the measurement. In diabetes mellitus, higher amounts of glycated hemoglobin, indicating poorer control of blood glucose levels, have been associated with cardiovascular disease, nephropathy, and retinopathy. Monitoring HbA1c in type 1 diabetic patients may improve outcomes.

**NOMENCLATURE OF HEMOGLOBIN FORMS:**

1. Ferrihemoglobin, also called methemoglobin, refers to hemoglobin which contains iron in the +3 oxidation state (Fe<sup>3+</sup>).
2. Ferrohemoglobin, also called reduced hemoglobin, refers to hemoglobin which contains iron in the +2 (or reduced) oxidation state (Fe<sup>2+</sup>). Hemoglobin must be in the reduced form to bind oxygen or other small molecules:
  - a. Oxyhemoglobin (HbO<sub>2</sub>) contains bound oxygen;
  - b. Deoxyhemoglobin (Hb) does not contain bound oxygen;
  - c. Carboxyhemoglobin (HbCO) contains carbon monoxide, which has displaced oxygen. The affinity of Hb for CO, a poisonous gas, is 325 times greater than its affinity for O<sub>2</sub>.

CAS NUMBER: 9008-02-0

SYNONYMS: Hb; Ferrohemoglobin

**PHYSICAL PROPERTIES:**

Appearance: Red-brown powder  
 pl: 6.84  
 Molecular weight: Mammalian hemoglobins have molecular weights of ~64,500.

**Source**

Hemoglobin is prepared from human plasma. All human derived material has been tested negative for HIV, HCV, and HbSAg. Nevertheless, all precautions should be taken and samples be treated as potentially hazardous.

**SOLUBILITY/ SOLUTION STABILITY:**

Hemoglobin is soluble in water (1 part in 7 of water), and slowly soluble in glycerol (dark red-brown solutions).

**Storage**

**Short-term:** unopened, undiluted liquid vials at -20°C and powder at 4°C or -20°C.

**Long-term:** at -20°C or below in suitable aliquots after reconstitution. Do not freeze and thaw and store working, diluted solutions.

**Stability:** 6-12 months at -20°C or below.

**Shipping:** 4°C for solutions and room temp for powder

**Recommended Usage**

**Western Blotting** (1-5 ug/ml for affinity pure IgG using ECL technique). ~17-18 Kda reduced.

**ELISA:** Control antigen can be used to coat ELISA plates at 1 ug/ml and detected with antibodies (0.5-1 ug/ml for affinity pure).

**Specificity & Cross-reactivity**

HEMG14-A reacts with human hemoglobin. It may crossreact with Hb from other species. Antibody crossreactivity in various species is not confirmed. Purified Hb protein (#HEMG15-N-100) or ready to use Western control (cat # HEMG14-C) can be used as +ve control for western.

**General References:** Maton A. et al. (1993). Human Biology and Health. Englewood Cliffs, New Jersey, USA: ISBN 0-13-981176-1; Dominguez de Villota E.D. et al. (1981) Br. J. Anaesth., 53, 1325-1328; Costanzo L. S. (2007) Physiology. Hagerstown, MD: Lippincott Williams & Wilkins. ISBN 0-7817-7311-3; Perutz M.F. et al. (1960) Nature, 185,416-422; Jintaridh P. et al. (2006) Int. J. Hematol., 83, 408-414; Gan Y.Y. et al. (1996) Ann. Acad. Med. Singapore, 25, 75-78.

\*This product is for in vitro research use only.

**Related material available from ADI**

Catalog# ProdDescription

HEMG11-A	Chicken Anti-Human+Rat Hemoglobin IgG/Y
HEMG14-A	Goat Anti-human hemoglobin (non-glycated) IgG, aff pure
HEMG14-A	Anti-Human Hemoglobin (non-glycated) IgG, aff pure
HEMG15-N-100	Purified Human Hemoglobin
HEMG16-N-1	Purified Rat Hemoglobin
HEMG17-N-1	Purified Mouse Hemoglobin
HEMG18-N-1	Purified fetal calf/bovine Hemoglobin
HEMG15-N-100	141014A