Antibodies to small peptide/haptens are generally raised by coupling to a large carrier proteins such as KLH (Keyhole Limpet Hemocyanin), KLH mol wt ranges 3-7.5 million. It is used for carrier protein as it offers plenty of free amino, carboxyl and cysteines for coupling various peptides or haptens.

Antibodies are produced to both KLH and the peptide/hapten. Anti-KLH may give non-specific signals in various immunoassays. Anti-KLH antibodies can be removed by solid phase immunoafinity column chromatography over the KLH-Agarose affinity column or by adsorbing with KLH protein.

Model Antigen or Control Antigen

Antibodies are produced to a foreign antigen (protein, peptide, small molecule, bacteria or viruses etc). Most large proteins are able to produce antibodies in a foreign host but small molecules (Haptens) such as small chemicals or drugs or antibiotics or peptides must be coupled to a large carrier protein (BSA, Ovalbumin, thyroglobulin, toxins etc) to make antibodies. The presence of antibody enhancers (adjuvants) often boost the antibody response by attracting the antibody producing cells. Traditionally, oil-based adjuvants, with or without killed bacteria (e.g., complete and incomplete Freund’s), are used for animal studies. Recently, non-Freund’s type adjuvants such as Titermax have been used to avoid the usage of Freund’s adjuvant or use in vaccines where traditional adjuvant cannot be used.

Model antigens have typically been used to study the immune status of immune compromised animals or to compare the effect of added substances (adjuvant). A variety of model antigens can be used: Proteins (medium size such ovalbumin (45 kda) or BSA (65 kda), Thyroglobulin & KLH (>100 Kda-million Kda), Peptides (10-100 amino acid), hapten (DNP), bacterial protein (HbsAg), Toxoid (Cholera or Diphtheria). Viral recombinant proteins (HIV or H1N1 or H5N1, influenza) are used to study the immune responses. The advantage of using these model antigens is that they are available in purified form and there antibodies and ELISA kits are also available. Model antigen doses, routes of immunization, frequency of injection, immunization period, animal selection, and the use of adjuvant must be selected based upon experimental protocol.

KLH use in therapeutics

KLH is being tested in a variety of cancer vaccines, including non-Hodgkins lymphoma, cutaneous melanoma, breast and bladder cancer. These vaccines contain specific tumor-associated antigens conjugated to KLH to stimulate anti-tumor immune responses which can destroy tumor cells. The rapidly growing interest in therapeutic vaccines (i.e. active immunotherapies) for cancer and the documented efficacy of KLH as a superior carrier protein for cancer vaccines are creating a significant biopharmaceutical market for KLH formulations.

Assays to monitor humoral immune responses against KLH in human serum have been developed to facilitate optimal use of biomedical KLH applications.

Source of antigen

Native KLH is solated and purified from the giant megathura crenulata. It contain 0.25% copper. It is supplied in powder in PBS buffer, pH 7.4 (0.2 u filtered). It is Opalescent blue liquid, may contain some particulates and fibers (>98% purity, ~370,000 kda, 1.8-2.5x10-3 copper to protein ratio).

Endotoxins: <0.1 EU/10 ug or 0.25 USP. EU/10 ug. Bioburden storage temp: Testing per Ph.Eur. 2.6.12 2-8 °C.

KLH is soluble in PBS at 5-10 mg/ml. Do not vortex vigorously as it may aggregate or precipitate. Gently add buffer and mix to dissolve. Slight turbidity will not affect its use for conjugation. It is also necessary to maintain Mg-concentration of >10 mM to keep diluted solution and prevent it from precipitation or aggregation.

Form & Storage

Supplied as lyophilized powder or in PBS solution containing. Store at 4oC.

Suggested Usage

As a carrier protein for coupling small peptide or hapten, as a model antigen to study immune response. Suitable for pre-clinical testing as therapeutic carrier protein.


Related item

Catalog# ProdDescription
700-100-KLG, Goat Anti-Keyhole limpet hemocyanin (KLH) IgG ELISA
700-110-KLR, Rabbit Anti-Keyhole limpet hemocyanin (KLH) IgG ELISA Kit
700-120-KLC, Chicken Anti-Keyhole limpet hemocyanin (KLH) IgG ELISA Kit
700-130-KLM, Mouse Anti-Keyhole limpet hemocyanin (KLH) IgG ELISA Kit
700-135-KGM, Human Anti-Keyhole hemocyanin (KLH) IgG ELISA Kit
700-140-KLG, Human Anti-Keyhole hemocyanin (KLH) IgG ELISA Kit
700-145-KLM, Human Anti-Keyhole hemocyanin (KLH) IgG ELISA Kit
700-200-KLG, Bovine Anti-Keyhole limpet hemocyanin (KLH) IgG ELISA Kit
700-205-KLM, Bovine Anti-Keyhole limpet hemocyanin (KLH) IgG ELISA Kit
700-210-KLA, Bovine Anti-Keyhole limpet hemocyanin (KLH) IgA ELISA Kit
AV-9325-10, Dinitrophenyl (DNP)-KLH protein Conjugate
DNP2S-N-10, Dinitrophenyl (DNP)-KLH protein Conjugate
KLH11-G, Keyhole Limpet Hemocyanin (KLH)-Agarose affinity gel for removing KLH antibodies
KLH11-G-S, Keyhole Limpet Hemocyanin (KLH)-Agarose af is finny gel for removing KLH antibodies
KLH12-M, monocular Anti-KLH (keyhole leimpet hemocyanin) Ascites
KLH13-S, Anti-KLH (keyhole hemocyanin) antiserum #3
KLH14-S, Anti-KLH (keyhole hemocyanin) antiserum #4
KLH15-S, Anti-KLH (keyhole hemocyanin) antiserum #5
KLH52-R-LE-1, Keyhole Limpet Hemocyanin (KLH, Megathura Crenulata, 98%, low endotoxin, azide free)

KLH52-R-LE-1-KLH-Low-Endotoxin 160113A