# Ipilimumab Biosimilar - Research Grade

**Bulk Ipilimumab Biosimilar - Research Grade**

**Product Benefits:**

ichorbio's Ipilimumab Biosimilar - Research Grade is manufactured in a cGMP compliant facility.

**Size:**

ichorbio's research grade ipilimumab biosimilar is available in the following sizes: 5mg, 10mg, 20mg, 50mg, 100mg ichorbio regularly manufactures bulk multi-gram amounts of our RUO ipilimumab biosimilar - please contact us for pricing.

**Target:**

CTLA-4

**Clone:**

n/a

**Isotype:**

IgG1 kappa

**Other Names:**

Ctla4, Cytotoxic T-lymphocyte protein 4, CD152

**Host:**

Humanized

**Species Reactivity:**

Human

**Specificity:**

Detects human CTLA-4.

**Purification Method:**

This monoclonal antibody was purified using multi-step affinity chromatography methods such as Protein A or G depending on the species and isotype.

**Background:**

Ipilimumab biosimilar is a recombinant, human monoclonal antibody that binds to the cytotoxic T-lymphocyte-associated antigen 4 (CTLA-4). It is an IgG1 kappa immunoglobulin with an approximate molecular weight of 148 kDa. Ipilimumab biosimilar is produced by Chinese hamster ovary cell culture.

**Concentration:**

1.0 - 5.0 mg/ml

**Formulation:**

Sterile, preservative-free, clear to pale yellow solution, pH 7.0, containing diethylene trioxide Amine pentaacetic acid (DTPA), mannitol, polysorbate 80 (plant origin), sodium chloride, and tris-hydrochloric acid. BSA and Azide free.

**Purity:**

>95% by SDS-PAGE and HPLC

**Endotoxin:**

? 0.75 EU/mg as determined by the LAL method

**Storage:**

This antibody is stable for at least 4 weeks when stored at 2-8°C. For long term storage, aliquot in working volumes without diluting and store at – 20°C or -80°C. Avoid repeated freeze thaw cycles.

**Applications:**

Functional Assays

**Application Notes:**

Each investigator should determine their own optimal working dilution for specific applications.

**Use:** ichorbio's ipilimumab biosimilar is for research use only (RUO). **Ipilimumab Research in 2020:** Ipilimumab is a recombinant human IgG1 monoclonal antibody directed against CTLA4 (cytotoxic T-lymphocyte-associated antigen 4). CTLA4 is an inhibitory receptor found at the surface of T-cells responsible for the downregulation of the immune response. Upon binding to CTLA4, ipilimumab acts as an immune checkpoint inhibitor and promotes T-cell activation against cancer cells. Ipilimumab was first approved by the FDA in 2011 for the treatment of melanoma and is now used to treat colorectal cancer, hepatocellular carcinoma, advanced melanoma, and renal cell carcinoma. It is currently under investigation for other types of advanced and metastatic cancers. Here are some examples of ipilimumab’s latest research. In March 2020, Brown et al. described one of the latest phase II clinical trials for patients with newly diagnosed glioblastoma (Ipi-glio). The goal of this open-label multicenter study is to test if the current standard of care for glioblastoma patients can be improved with ipilimumab after surgery and radiotherapy. For this, a total of 120 patients were included in the trial and given either ipilimumab with temozolomide or temozolomide alone. Patients will be tested for overall survival after 18 months, 5 years and long term. They are also closely monitored for the safety, tolerability, and toxicity of the treatment. The Ipi-Glio study is currently ongoing. Not long before that, George et al. (2020) reported the benefit of ipilimumab addition in the salvage treatment of a patient with metastatic sarcomatoid renal cell carcinoma (sRCC). sRCC is an aggressive

form of RCC that is associated with poorer prognosis. Given the transient response of current treatments, researchers are still investigating other therapeutic avenues including immunotherapy with checkpoint inhibitors. Here, the authors described the case of a 46-year-old patient with sRCC who obtained an initial response after treatment with ipilimumab in combination with nivolumab. The progression of the disease was unfortunately rapid on maintenance nivolumab, but when re-challenge with ipilimumab after 3 months, the authors measured a subsequent response which was maintained for an additional 9 months. In January 2020, Cancers published a paper by Zhang et al. where the authors developed a strategy to rank the major human cancers for their predicted response to the next generation of anti-CTLA-4 antibodies. For this, they integrated available data from ipilimumab's research with mRNA expression quantification (HTSeq–FPKM), genomic profiles (somatic mutation and germline SNP), clinical data (cBioPortal for Cancer Genomics) and immunological files (NIH Genomic Data Commons) for a total of 7279 samples from 22 cancer types. As expected, metastatic melanoma received the highest rank while 10 other types of cancer were ranked above primary melanoma. The authors concluded that their study was "the first one providing an objective ranking of human cancers sensitivity to anti-CTLA-4 antibodies". Late January 2020, Clinical Cancer Research published the result of a study investigating the effect of immune checkpoint inhibition (ICI) on immune-related toxicity and survival during cancer treatment. Verheijden et al. analyzed data from 1250 patients with advanced melanoma. This included 576 patients treated with ipilimumab alone and 85 patients with combination therapy. Severe ICI toxicity was associated with prolonged overall survival. However, the median overall survival was lower for patients who also received anti-TNF for steroid-refractory toxicity. Keywords: CTLA4; immune checkpoints; melanoma; sRCC; ipilimumab; advanced tumors. References: George G, Schmidt L, Tolat P, Riese M, Kilari D. (2020). Salvage ipilimumab associated with a significant response in sarcomatoid renal cell carcinoma. J Immunother Cancer. 2020 Feb;8(1). Nicholas F. Brown, Stasya M. Ng, Claire Brooks, Tim Coutts, Jane Holmes, Corran Roberts, Leena Elhussein, Peter Hoskin, Tim Maughan, Sarah Blagden & Paul Mulholland. (2020). A phase II open label, randomised study of ipilimumab with temozolomide versus temozolomide alone after surgery and chemoradiotherapy in patients with recently diagnosed glioblastoma: the Ipi-Glio trial protocol. BMC Cancer volume 20, Article number: 198 (2020). Rik J. Verheijden, Anne M. May, Christian U. Blank, Maureen J.B. Aarts, Franchette W.P.J. van den Berkmortel, Alfonsus J.M. van den Eertwegh, Jan Willem B. de Groot, Marye J. Boers-Sonderen, Jacobus J.M. van der Hoeven, Geke A. Hospers, Djura Piersma, Rozemarijn S. van Rijn, Albert ten Tije, Astrid AM van der Veldt, Gerard Vreugdenhil, Michiel C.T. van Zeijl, Michel W.J.M. Wouters, John B.A.G. Haanen, Ellen Kapiteijn and Karijn PM Suijkerbuijk. (2020). Association of anti-TNF with decreased survival in steroid refractory ipilimumab and anti-PD1 treated patients in the Dutch Melanoma Treatment Registry. Clin Cancer Res. 2020 Jan 27. Sarah L. Picardo, Jeffrey Doi and Aaron R. Hansen. (2020). Structure and Optimization of Checkpoint Inhibitors. Cancers 2020, 12(1), 38. Zhang P, Xiong X, Rolfo C, Du X, Zhang Y, Yang H, Russo A, Devenport M, Zhou P, Liu Y, Zheng P. (2020). Mechanism- and Immune Landscape-Based Ranking of Therapeutic Responsiveness of 22 Major Human Cancers to Next Generation Anti-CTLA-4 Antibodies. Cancers (Basel). 2020 Jan 24;12(2). **Isotype Control:**

Bulk Human IgG1 Isotype Control (IB1) [ICH2254]