ANTIBODIES



Switch natural isotypes

- Clinically relevant monoclonal antibodies
- --- Fine-tuned effector functions
- Up to 14 different native and engineered isotypes

InvivoGen provides a series of clinically relevant antibodies in their original format or with different immunoglobulin isotypes. Our engineered antibodies are designed to adjust their effector functions, including half-life, complement-dependent cytotoxicity (CDC), antibody-dependent cellular cytotoxicity (ADCC) and antibody-dependent cell phagocytosis (ADCP). The variety of the immunoglobulin constant regions helps you determine the most suitable isotype for your application.

Antibodies against various targets

Anti-hCD20 Anti-hPD1

Anti-hCTLA4 Anti-hPD-L1

Anti-hEGFR Anti-hTNF- α

Anti-HER2 Anti-hVEGF

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Description

Monoclonal antibodies (mAbs) have become a major tool in the treatment of cancer and auto-immune diseases. The efficacy of antibodies is governed by their **bifunctional nature**. On the one hand, the variable domain of the immunoglobulin, within the fragment of antigen binding (Fab), confers **antigen specificity function**. On the other hand, the fragment crystallizable region (Fc) in the constant domain of the immunoglobulin triggers **antibody-mediated effector functions** by engaging a variety of Fc receptors. Antibody isotype switching is a biological process enabling changes in the ability of the antibody to interact with different Fc receptors and thus, reduce or potentiate effector functions. InvivoGen's antibody **isotype families** consist of **clinically relevant mAbs** comprising the same variable domain and the constant domain of various isotypes, therefore differing in their suitability for a given application.

Native and engineered isotypes

Native isotype antibodies

Physiological native isotypes trigger various combinations of effector functions that are summarized in the table below.

• IgG1NQ isotype antibodies

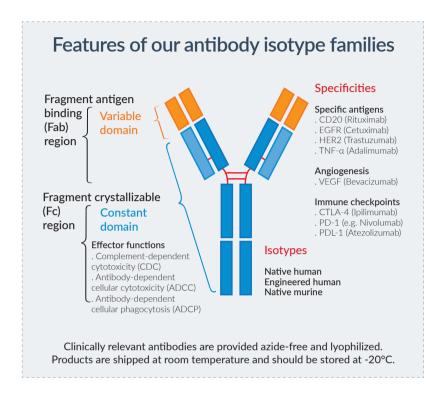
This isotype contains a N-glycosylation mutation of the constant region where potential asparagine (N) glycosylation sites are substituted by glutamine (Q) residues. These mAbs are non-glycosylated and their effector mechanisms mediated through the Fc receptor (Fc\gammaRI, Fc\gammaRII and Fc\gammaRIII), and the C1q component of the complement, are severely compromised or ablated.

IgG1fut isotype antibodies

The constant region of these mAbs is not fucosylated. This results in dramatic enhancement of ADCC without any change in CDC.

• IgG4 (S228P) isotype antibodies

IgG4 antibodies undergo a process known as Fab arm exchange that potentially reduces their therapeutic efficacy. IgG4 (S228P) mAbs contain an engineered hinge region mutation (S228P) designed to prevent exchange of IgG4 molecules.



	Native human isotypes						Engineered human isotypes			Native murine isotypes				
Effector functions	lgG1	lgG2	lgG3	lgG4	IgM	lgA1	lgA2	IgE	lgG1NQ	lgG1fut	IgG4 (S228P)	lgG1	IgG2a	lgA
ADCC	++	+/-	++	+/-	+	+	+	+	-	++++	+/-	+/-	++	+
ADCP	+++	+/-	++	+	=	+	+	=	-	+++	+	+	+++	+
CDC	++	+	+++	-	+++	-	-	-	+/-	+	-	-	++	-

Antibody specificities

Human CD20

CD20 (also known as B1) is a cell-surface marker expressed in both malignant and normal B cells. CD20 plays a role in the differentiation process of B cells into plasma cells. The hCD20 antibody family features the variable region of **rituximab**, a chimeric human/mouse IgG1 mAb. Binding of rituximab to CD20 results in cell destruction through different mechanisms including direct signaling of apoptosis, complement activation and cell-mediated cytotoxicity.

Human CTLA4

CTLA-4 (also known as CD152) is transiently expressed by activated T cells and highly expressed by regulatory T cells and it transduces negative intracellular signals upon binding to CD80 and CD86. The hCTLA4 antibody family features the variable region of <code>ipilimumab</code> which is a fully human lgG1 mAb. Ipilimumab blocks the immunosuppressive action of CTLA-4 and enhances antitumor T-cell responses. In addition, ipilimumab induces ADCC and TNF- α production.

Human EGFR

The epidermal growth factor receptor (EGFR) is over-expressed in cancer cells and plays a key role in their proliferation and survival. The anti-hEGFR family features the variable region of **cetuximab**. Cetuximab is a chimeric human/mouse IgG1 mAb that targets EGFR, a cell surface receptor over-expressed in many types of cancer. Binding of cetuximab to EGFR blocks ligand/receptor binding, and induces receptor internalization and subsequent degradation.

• HER2 receptor

The human epidermal receptor HER2 (or HER2/neu, or ERBB2) is expressed at the cell membrane of epithelial cells and plays an important role in normal cell growth and differentiation. However, in some cancers, particularly in breast and ovarian cancers, HER2 is over-expressed and causes uncontrollable cell proliferation. The HER2 antibody family features the variable region of **trastuzumab**. Trastuzumab is a humanized IgG1 mAb whose binding to HER2 results in cell death through ADCC and ADCP.

• Human PD-1

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The programmed cell death 1 (PD-1) receptor is expressed mostly by activated T cells, but also by activated B cells, dendritic cells, monocytes and natural killer cells. Upon its binding to PD-L1, PD-1 mediates a negative intracellular signaling. The anti-hPD1 family features the variable region of **nivolumab** or **pembrolizumab**. Nivolumab is a fully human IgG4 (S228P) and pembrolizumab is a humanized IgG4 (S228P). These two mAbs bind and block the activation of PD-1, thus relieving immuno-suppression.

• Human PD-L1

The programmed cell death ligand 1 (PD-L1) is a transmembrane protein over-expressed on tumor cells and tumor infiltrating immune cells, such as macrophages. Binding of PD-L1 to PD-1 on cytotoxic T cells inhibits the antitumor immune response. The anti-hPD-L1 isotype family features the variable region of **atezolizumab**, a fully humanized IgG1 mAb that contains an Asp to Ala change introduced at position 298 (N298A) to eliminate its ability to bind to human Fc γ receptors. Atezolizumab is a blocking mAb targeting both human and mouse PD-L1.

For studies in mice, InvivoGen has developed anti-hPD-L1-mlgG1, containing a mouse lgG1 Fc domain to prevent anti-drug-antibodies. Anti-hPD-L1-mlgG1 InvivoFit $^{\text{TM}}$ is available at a preclinical grade, sterile and endotoxin-free (<1 EU/mg).

ICOTVDE

• Human TNF-α

The tumor necrosis factor alpha (TNF- α) is a pro-inflammatory cytokine mainly secreted by macrophages and is implicated in a number of diseases, notably autoimmune diseases and cancer. The TNF- α antibody family features the variable region of **adalimumab**, a fully human mAb which blocks the interaction of TNF- α with TNF receptors, thereby downregulating the inflammatory reactions associated with autoimmune diseases.

Human VEGF

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The vascular endothelial growth factor (VEGF) plays an essential role in angiogenesis and it is over-expressed in many tumors. The anti-hVEGF family features the variable region of **bevacizumab**, a humanized IgG1 mAb which blocks VEGF interaction with the VEGF receptor thus inhibiting downstream pathways that regulate cell growth and angiogenesis.

CAT CODE

Antibody Isotype Families

PRODUCT		ISOTYPE	QUANTITY*	CAT. CODE
Anti-hCD20 antibodies, variable	e region of rituxima	b		
Anti-hCD20-hlgG1**		Human IgG1	100 μg	hcd20-mab1
Anti-hCD20-hlgG1NQ		Human IgG1, non-glycosylated	100 μg	hcd20-mab12
Anti-hCD20-hlgG1fut		Human IgG1, non-fucosylated	100 μg	hcd20-mab13
Anti-hCD20-hlgG2**		Human IgG2	100 μg	hcd20-mab2
Anti-hCD20-hlgG3		Human IgG3	100 μg	hcd20-mab3
Anti-hCD20-hlgG4		Human IgG4	100 μg	hcd20-mab4
Anti-hCD20-hlgG4 (S228P)		Human IgG4 (S228P)	100 μg	hcd20-mab14
Anti-hCD20-hlgM		Human IgM	100 μg	hcd20-mab5
Anti-hCD20-hlgA1**		Human IgA1	100 μg	hcd20-mab6
Anti-hCD20-hlgA2**		Human IgA2	100 μg	hcd20-mab7
Anti-hCD20-hlgE		Human IgE	100 μg	hcd20-mab8
Anti-hCTLA4 antibodies, variab	le region of ipilimur	mab		
Anti-hCTLA4-hlgG1		Human IgG1	100 μg	hctla4-mab1
Anti-hCTLA4-hlgG1NQ	NEW	Human IgG1, non-glycosylated	100 μg	hctla4-mab12
Anti-hCTLA4-hlgG1fut		Human IgG1, non-fucosylated	100 μg	hctla4-mab13
Anti-hCTLA4-hlgG2	NEW	Human IgG2	100 μg	hctla4-mab2
Anti-hCTLA4-hIgG4 (S228P)		Human IgG4 (S228P)	100 μg	hctla4-mab14
Anti-hCTLA4-hIgA2		Human IgA2	100 μg	hctla4-mab7
Anti-hEGFR antibodies, variable	region of cetuxima	ab		
Anti-hEGFR-hlgG1		Human IgG1	100 μg	hegfr-mab1
Anti-hEGFR-hIgG1NQ	NEW	Human IgG1, non-glycosylated	100 μg	hegfr-mab12
Anti-hEGFR-hlgG1fut	NEW	Human IgG1, non-fucosylated	100 μg	hegfr-mab13
Anti-hEGFR-hIgG2	NEW	Human IgG2	100 μg	hegfr-mab2
Anti-hEGFR-hlgG4 (S228P)		Human IgG4 (S228P)	100 μg	hegfr-mab14
Anti-hEGFR-hIgGA2		Human IgA2	100 μg	hegfr-mab7

Anti-IHER2 antibodies, variable region of trastuzumab Anti-HER2-Tro-ligG1 Human IgG4 (\$228P) 100 µg her2tra-mab14 Anti-HER2 Tra-ligG4 (\$228P) Human IgG4 (\$228P) 100 µg her2tra-mab14 Anti-HEP1 antibodies, variable region of nivolumab or pembrolizumab Human IgG1 100 µg hpd1n-mab1 Anti-HPD1-Ni-HigG1NQ NEW Human IgG1, non-flycosylated 100 µg hpd1ni-mab12 Anti-HPD1-Ni-HigG2NQ NEW Human IgG2, non-flycosylated 100 µg hpd1ni-mab12 Anti-HPD1-Ni-HigG2 Human IgG2, non-flycosylated 100 µg hpd1ni-mab12 Anti-HPD1-Ni-HigG2 Human IgG2 100 µg hpd1ni-mab13 Anti-HPD1-Ni-HigG2 Human IgG4 (\$228P) 100 µg hpd1ni-mab14 Anti-HPD1-Ni-HigG2 NEW Human IgG1 100 µg hpd1ni-mab14 Anti-HPD1-Pem-HigG3 NEW Human IgG1 100 µg hpd1pe-mab1 Anti-HPD1-Pem-HigG3 NEW Human IgG2 100 µg hpd1pe-mab12 Anti-HPD1-Pem-HigG3 NEW Human IgG4 (\$228P) 100 µg hpd1pe-mab12	PRODUCT		ISOTYPE	QUANTITY*	CAT. CODE
Anti-HER2-Tra-hig64 (\$228P)	Anti-hHER2 antibodies, variable	region of trastuzu	mab		
Anti-HPD1 antibodies, variable region of nivolumab or pembro/izumab Human IgG1 100 μg her2tra mab7 Anti-HPD1 Ni HigG1NQ NEW Human IgG1, non glycosylated 100 μg hpd1ni mab1 Anti-hPD1-Ni-HigG1Rut NEW Human IgG2, non-fucosylated 100 μg hpd1ni-mab13 Anti-hPD1-Ni-HigG2 Human IgG4 (S228P) 100 μg hpd1ni-mab12 Anti-hPD1-Ni-HigG4 (S228P) Human IgG4 (S228P) 100 μg hpd1ni-mab14 Anti-hPD1-Ni-HigG4 (S228P) Human IgG4 (S228P) 100 μg hpd1ni-mab14 Anti-hPD1-Ni-HigG4 (S228P) Human IgG4 100 μg hpd1ni-mab17 Anti-hPD1-Ni-HigG4 (S228P) NEW Human IgG1 100 μg hpd1pe-mab1 Anti-hPD1-Pern-higG1 NEW Human IgG1 100 μg hpd1pe-mab12 Anti-hPD1-Pern-higG4 (S228P) NEW Human IgG4 (S228P) 100 μg hpd1pe-mab14 Anti-hPD1-Li nipG64 (S228P) NEW Human IgG4 (S228P) 100 μg hpd1pe-mab14 Anti-hPD-Li nipG61 (N298A) Human IgG1, non-fucosylated 100 μg hpd1-mab13 Anti-hPD-Li nipG61 (N298A) Human IgG1, non-fucosy	Anti-HER2-Tra-hlgG1		Human IgG1	100 μg	her2tra-mab1
Anti-hPD1 antibodies, variable region of nivolumab or pembrolizumab Homan IgG1 100 μg hpd1ni-mab1 Anti-hPD1-Ni-higG1NQ NEW Human IgG1, non-fucosylated 100 μg hpd1ni-mab12 Anti-hPD1-Ni-higG1fut NEW Human IgG1, non-fucosylated 100 μg hpd1ni-mab13 Anti-hPD1-Ni-higG2 Human IgG4 (S228P) 100 μg hpd1ni-mab13 Anti-hPD1-Ni-higG4 (S228P) Human IgG4 (S228P) 100 μg hpd1ni-mab14 Anti-hPD1-Ni-higG4 (S228P) Human IgG1 100 μg hpd1ni-mab17 Anti-hPD1-Ni-higG3 NEW Human IgG1 100 μg hpd1ni-mab17 Anti-hPD1-Pem-hIgG1 (S228P) NEW Human IgG1 100 μg hpd1pe-mab12 Anti-hPD1-Pem-hIgG6 (S228P) NEW Human IgG2 100 μg hpd1pe-mab12 Anti-hPD1-Pem-hIgA2 NEW Human IgG2 100 μg hpd1pe-mab14 Anti-hPD1-Pem-hIgA2 NEW Human IgG1 100 μg hpd1pe-mab7 Anti-hPD1-Li antibodies, variable region of atezolizumab Human IgG1 100 μg hpd11-mab14 Anti-hPD1-Li higG1 (Intra-ligG1) NEW <td>Anti-HER2-Tra-hlgG4 (S228P)</td> <td></td> <td>Human IgG4 (S228P)</td> <td>100 μg</td> <td>her2tra-mab14</td>	Anti-HER2-Tra-hlgG4 (S228P)		Human IgG4 (S228P)	100 μg	her2tra-mab14
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Anti-hPD1-Pem-hlgG1NQ NEW Human IgG1, non-glycosylated 100 μg hpd1pe-mab12 Anti-hPD1-Pem-hlgG2 NEW Human IgG2 100 μg hpd1pe-mab2 Anti-hPD1-Pem-hlgG4 (S228P) NEW Human IgG4 (S228P) 100 μg hpd1pe-mab14 Anti-hPD1-Pem-hlgA2 NEW Human IgA2 100 μg hpd1pe-mab7 Anti-hPD-L1-antibodies, variable region of atezolizumab Human IgG1 100 μg hpd1r-mab7 Anti-hPD-L1-hlgG1 Human IgG1, (N298A) 100 μg hpd1r-mab12 Anti-hPD-L1-hlgG1 (N298A) Human IgG1, (N298A) 100 μg hpd1r-mab12 Anti-hPD-L1-hlgG1fut NEW Human IgG2 100 μg hpd1r-mab13 Anti-hPD-L1-mlgG1 Meman IgG2 100 μg hpd1r-mab2 Anti-hPD-L1-mlgG1 Murine IgG1 5 x 1 mg hpd1r-mab9 Anti-hPD-L1-mlgG1 (InvivoFit™ (preclinical grade) Murine IgG1 5 x 1 mg hpd1r-mab9-5 Anti-hNF-α-nlgG1 (InvivoFit™ (preclinical grade) Murine IgG1 100 μg htnfa-mab1 Anti-TNF-α-llgG3 Human IgG2 100 μg htnfa-mab2 <	Anti-hPD1-Ni-hlgA2		Human IgA2	100 μg	hpd1ni-mab7
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Anti-hPD-1-Pem-hIgA2 NEW Human IgA2 100 μg hpd1pe-mab7 Anti-hPD-L1-hIgG1 Human IgG1 100 μg hpd1rmab1 Anti-hPD-L1-hIgG1 (N298A) Human IgG1, (N298A) 100 μg hpd1rmab12 Anti-hPD-L1-hIgG1 (N298A) Human IgG1, (N298A) 100 μg hpd1rmab13 Anti-hPD-L1-hIgG2 NEW Human IgG2 100 μg hpd1rmab2 Anti-hPD-L1-mIgG1 New Human IgG2 100 μg hpd1rmab2 Anti-hPD-L1-mIgG1 New Human IgG1 100 μg hpd1rmab9 Anti-hPD-L1-mIgG1 InvivoFit™ (preclinical grade) Murine IgG1 100 μg hpd1rmab9 Anti-hTNF-α antibodies, variable region of adalimumab Anti-TNF-α hIgG1*** Human IgG2 100 μg htnfa-mab1 Anti-TNF-α-hIgG3 Human IgG2 100 μg htnfa-mab2 Anti-TNF-α-hIgG3 Human IgG3 100 μg htnfa-mab2 Anti-TNF-α-hIgG4 Human IgG3 100 μg htnfa-mab1 Anti-TNF-α-hIgG4 Human IgG4 100 μg htnfa-mab4 Anti-TNF-α-hIgA1*** Human IgG4 100 μg htnfa-mab5 Anti-TNF-α-hIgA1*** Human IgA1 100 μg htnfa-mab5 Anti-TNF-α-hIgA1*** Human IgA1 100 μg htnfa-mab6 Anti-TNF-α-hIgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hIgA2*** Human IgA2 100 μg htnfa-mab6 Anti-TNF-α-hIgB4*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hIgE Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hIgE Human IgA2 100 μg htnfa-mab8 Anti-TNF-α-hIgE Human IgA4 100 μg htnfa-mab8 Anti-TNF-α-hIgE Human IgA4 100 μg htnfa-mab8 Anti-TNF-α-hIgE Human IgA4 100 μg htnfa-mab8	Anti-hPD1-Pem-hlgG2	NEW	Human IgG2	100 μg	hpd1pe-mab2
Anti-hPD-L1 antibodies, variable region of atezolizumab Anti-hPD-L1-higG1	Anti-hPD1-Pem-hlgG4 (S228P)	NEW	Human IgG4 (S228P)	100 μg	hpd1pe-mab14
Anti-hPD-L1-hIgG1	Anti-hPD1-Pem-hlgA2	NEW	Human IgA2	100 μg	hpd1pe-mab7
Anti-PP-L1-higG1 (N298A) Human IgG1, (N298A) 100 μg hpdl1-mab12 Anti-PP-L1-higG2 (NEW) Human IgG2, non-fucosylated 100 μg hpdl1-mab13 Anti-PP-L1-higG2 (NEW) Human IgG2 (New) Human IgG2 (No) μg hpdl1-mab2 (No) μg Anti-PP-L1-migG1 (InvivoFit™ (preclinical grade) Murine IgG1 (No) μg hpdl1-mab9 (No) μg Anti-TNF-α antibodies, variable region of adalimumab Human IgG1 (No) μg htnfa-mab1 (No) μg Anti-TNF-α-higG1*** Human IgG2 (No) μg htnfa-mab1 (No) μg Anti-TNF-α-higG3 (No) μg Human IgG3 (No) μg htnfa-mab3 (No) μg Anti-TNF-α-higG4 (No) μg Human IgG4 (No) μg htnfa-mab4 (No) μg Anti-TNF-α-higA1*** Human IgA1 (No) μg htnfa-mab5 (No) μg Anti-TNF-α-higA2*** Human IgA2 (No) μg htnfa-mab7 (No) μg Anti-TNF-α-higE Human IgE 100 μg htnfa-mab8 (No) μg Anti-TNF-α-α-higE Human IgG1 (No) μg	Anti-hPD-L1 antibodies, variable	region of atezoliz	umab		
Anti-hPD-L1-hIgG1fut NEW Human IgG1, non-fucosylated 100 μg hpdl1-mab13 Anti-hPD-L1-hIgG2 NEW Human IgG2 100 μg hpdl1-mab2 Anti-hPD-L1-mIgG1 Murine IgG1 100 μg hpdl1-mab9 Anti-hPD-L1-mIgG1 InvivoFit™ (preclinical grade) Murine IgG1 5 x 1 mg hpdl1-mab9-5 Anti-hTNF-α antibodies, variable region of adalimumab Human IgG1 100 μg htnfa-mab1 Anti-TNF-α-hIgG2**** Human IgG2 100 μg htnfa-mab2 Anti-TNF-α-hIgG3 Human IgG3 100 μg htnfa-mab3 Anti-TNF-α-hIgG4 Human IgG4 100 μg htnfa-mab5 Anti-TNF-α-hIgA1*** Human IgA1 100 μg htnfa-mab6 Anti-TNF-α-hIgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hIgE Human IgE 100 μg htnfa-mab8 Anti-TNF-α-hIgG4 (S228P) Human IgG4 (S228P) 100 μg hvegf-mab1	Anti-hPD-L1-hlgG1		Human IgG1	100 μg	hpdl1-mab1
Anti-hPD-L1-hIgG2 NEW Human IgG2 100 μg hpdl1-mab2 Anti-hPD-L1-mIgG1 1nvivoFit™ (preclinical grade) Murine IgG1 100 μg hpdl1-mab9-5 Anti-hTNF-α antibodies, variable region of adalimumab Anti-TNF-α-hIgG2*** Human IgG2 100 μg htnfa-mab1 Anti-TNF-α-hIgG3 Human IgG3 100 μg htnfa-mab2 Anti-TNF-α-hIgG3 100 μg htnfa-mab3 Anti-TNF-α-hIgG4 Human IgG4 100 μg htnfa-mab3 Anti-TNF-α-hIgM Human IgM 100 μg htnfa-mab4 Anti-TNF-α-hIgM Human IgM 100 μg htnfa-mab5 Anti-TNF-α-hIgM Human IgM 100 μg htnfa-mab5 Anti-TNF-α-hIgA1*** Human IgA1 100 μg htnfa-mab6 Anti-TNF-α-hIgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hIgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hIgB Human IgE 100 μg htnfa-mab8 Anti-TNF-α-hIgB Human IgE 100 μg htnfa-mab8 Anti-VEGF, variable region of bevacizumab Anti-NYEGF-hIgG1 Human IgG1 100 μg hvegf-mab1 Anti-NYEGF-hIgG4 (S228P) Human IgG4 (S228P)	Anti-hPD-L1-hlgG1 (N298A)		Human IgG1, (N298A)	100 μg	hpdl1-mab12
Anti-hPD-L1-mlgG1	Anti-hPD-L1-hlgG1fut	NEW	Human IgG1, non-fucosylated	100 μg	hpdl1-mab13
Anti-hPD-L1-mlgG1 InvivoFit™ (preclinical grade) Anti-hTNF-α antibodies, variable region of adalimumab Anti-TNF-α-hlgG1*** Anti-TNF-α-hlgG2*** Anti-TNF-α-hlgG3 Anti-TNF-α-hlgG4 Anti-TNF-α-hlgG4 Anti-TNF-α-hlgM Anti-TNF-α-hlgM Anti-TNF-α-hlgA1*** Human lgM Anti-TNF-α-hlgA1*** Human lgM Anti-TNF-α-hlgA1*** Human lgA1 Anti-TNF-α-hlgA2*** Human lgA2 Anti-TNF-α-hlgE Anti-TNF-α-hlgE Anti-TNF-α-hlgE Human lgA2 Anti-TNF-α-hlgE Anti-TNF-α-hlgE Human lgA2 Anti-TNF-α-hlgE Anti-TNF-α-hlgE Human lgA2 Anti-TNF-α-hlgE Anti-TNF-α-hlgE Human lgC1 Anti-TNF-α-hlgC1 Anti-NEGF-hlgC1 Anti-NEGF-hlgC4 (S228P) Human lgC4 (S228P) Human lgC4 (S228P) Houpen lgC4 Anti-NEGF-hlgC4 (S228P) Houpen lgC4 Anti-NEGF-hlgC4 (S228P) Houpen lgC4 Houpen lgC4 Anti-NEGF-hlgC4 (S228P) Houpen lgC4 Hou	Anti-hPD-L1-hlgG2	NEW	Human IgG2	100 μg	hpdl1-mab2
Anti-hTNF-α antibodies, variable region of adalimumabAnti-TNF-α-hlgG1***Human lgG1100 μghtnfa-mab1Anti-TNF-α-hlgG2***Human lgG2100 μghtnfa-mab2Anti-TNF-α-hlgG3Human lgG3100 μghtnfa-mab3Anti-TNF-α-hlgG4Human lgG4100 μghtnfa-mab4Anti-TNF-α-hlgMHuman lgM100 μghtnfa-mab5Anti-TNF-α-hlgA1***Human lgA1100 μghtnfa-mab6Anti-TNF-α-hlgA2***Human lgA2100 μghtnfa-mab7Anti-TNF-α-hlgEHuman lgE100 μghtnfa-mab8Anti-VEGF, variable region of bevacizumabAnti-hVEGF-hlgG1Human lgG1100 μghvegf-mab1Anti-hVEGF-hlgG4 (S228P)Human lgG4 (S228P)100 μghvegf-mab14	Anti-hPD-L1-mlgG1		Murine IgG1	100 μg	hpdl1-mab9
Anti-TNF-α-hlgG1***Human lgG1100 μghtnfa-mab1Anti-TNF-α-hlgG2****Human lgG2100 μghtnfa-mab2Anti-TNF-α-hlgG3Human lgG3100 μghtnfa-mab3Anti-TNF-α-hlgG4Human lgG4100 μghtnfa-mab4Anti-TNF-α-hlgMHuman lgM100 μghtnfa-mab5Anti-TNF-α-hlgA1***Human lgA1100 μghtnfa-mab6Anti-TNF-α-hlgA2***Human lgA2100 μghtnfa-mab7Anti-TNF-α-hlgEHuman lgE100 μghtnfa-mab8Anti-VEGF, variable region of bevacizumabAnti-hVEGF-hlgG1Human lgG1100 μghvegf-mab1Anti-hVEGF-hlgG4 (S228P)Human lgG4 (S228P)100 μghvegf-mab14	Anti-hPD-L1-mlgG1 InvivoFit™ (precl	inical grade)	Murine IgG1	5 x 1 mg	hpdl1-mab9-5
Anti-TNF-α-hlgG2*** Human lgG2 100 μg htnfa-mab2 Anti-TNF-α-hlgG3 Human lgG3 100 μg htnfa-mab3 Anti-TNF-α-hlgG4 Human lgG4 100 μg htnfa-mab4 Anti-TNF-α-hlgM Human lgM 100 μg htnfa-mab5 Anti-TNF-α-hlgA1*** Human lgA1 100 μg htnfa-mab6 Anti-TNF-α-hlgA2*** Human lgA2 100 μg htnfa-mab7 Anti-TNF-α-hlgE Human lgE 100 μg htnfa-mab8 Anti-VEGF, variable region of bevacizumab Anti-hVEGF-hlgG1 Human lgG1 100 μg hvegf-mab1 Anti-hVEGF-hlgG4 (S228P) Human lgG4 (S228P) 100 μg hvegf-mab14	Anti-hTNF- $lpha$ antibodies, variable	region of adalimu	mab		
Anti-TNF-α-hlgG3 Human IgG3 100 μg htnfa-mab3 Anti-TNF-α-hlgG4 Human IgG4 100 μg htnfa-mab4 Anti-TNF-α-hlgM Human IgM 100 μg htnfa-mab5 Anti-TNF-α-hlgA1*** Human IgA1 100 μg htnfa-mab6 Anti-TNF-α-hlgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hlgE Human IgE 100 μg htnfa-mab8 Anti-VEGF, variable region of bevacizumab Anti-hVEGF-hlgG1 Human IgG1 100 μg hvegf-mab1 Anti-hVEGF-hlgG4 (S228P) Human IgG4 (S228P) 100 μg hvegf-mab14	Anti-TNF-α-hlgG1***		Human IgG1	100 μg	htnfa-mab1
Anti-TNF-α-hlgG4Human lgG4100 μghtnfa-mab4Anti-TNF-α-hlgMHuman lgM100 μghtnfa-mab5Anti-TNF-α-hlgA1***Human lgA1100 μghtnfa-mab6Anti-TNF-α-hlgA2***Human lgA2100 μghtnfa-mab7Anti-TNF-α-hlgEHuman lgE100 μghtnfa-mab8Anti-VEGF, variable region of bevacizumabAnti-hVEGF-hlgG1Human lgG1100 μghvegf-mab1Anti-hVEGF-hlgG4 (S228P)Human lgG4 (S228P)100 μghvegf-mab14	Anti-TNF-α-hlgG2***		Human IgG2	100 μg	htnfa-mab2
Anti-TNF-α-hlgM Anti-TNF-α-hlgA1*** Human lgA1 100 μg htnfa-mab5 Anti-TNF-α-hlgA2*** Human lgA2 100 μg htnfa-mab7 Anti-TNF-α-hlgE Human lgE 100 μg htnfa-mab7 Anti-TNF-α-hlgE Anti-VEGF, variable region of bevacizumab Anti-hVEGF-hlgG1 Human lgG1 100 μg hvegf-mab1 Anti-hVEGF-hlgG4 (S228P) Human lgG4 (S228P)	Anti-TNF-α-hlgG3		Human IgG3	100 μg	htnfa-mab3
Anti-TNF-α-hlgA1*** Anti-TNF-α-hlgA2*** Anti-TNF-α-hlgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hlgE Human IgE 100 μg htnfa-mab8 Anti-VEGF, variable region of bevacizumab Anti-hVEGF-hlgG1 Human IgG1 100 μg hvegf-mab1 Anti-hVEGF-hlgG4 (S228P) Human IgG4 (S228P)	Anti-TNF-α-hlgG4		Human IgG4	100 μg	htnfa-mab4
Anti-TNF-α-hlgA2*** Human IgA2 100 μg htnfa-mab7 Anti-TNF-α-hlgE Human IgE 100 μg htnfa-mab8 Anti-VEGF, variable region of bevacizumab Anti-hVEGF-hlgG1 Human IgG1 100 μg hvegf-mab1 Anti-hVEGF-hlgG4 (S228P) Human IgG4 (S228P) 100 μg hvegf-mab14	Anti-TNF-α-hlgM		Human IgM	100 μg	htnfa-mab5
Anti-TNF-α-hIgEHuman IgE100 μghtnfa-mab8Anti-VEGF, variable region of bevacizumabHuman IgG1100 μghvegf-mab1Anti-hVEGF-hIgG4 (S228P)Human IgG4 (S228P)100 μghvegf-mab14	Anti-TNF-α-hlgA1***		Human IgA1	100 μg	htnfa-mab6
Anti-VEGF, variable region of bevacizumabAnti-hVEGF-hlgG1Human lgG1100 μghvegf-mab1Anti-hVEGF-hlgG4 (S228P)Human lgG4 (S228P)100 μghvegf-mab14	Anti-TNF-α-hlgA2***		Human IgA2	100 μg	htnfa-mab7
Anti-hVEGF-hlgG1Human lgG1100 μghvegf-mab1Anti-hVEGF-hlgG4 (S228P)Human lgG4 (S228P)100 μghvegf-mab14	Anti-TNF-α-hlgE		Human IgE	100 μg	htnfa-mab8
Anti-hVEGF-hlgG4 (S228P) Human lgG4 (S228P) 100 μg hvegf-mab14	Anti-VEGF, variable region of bev	vacizumab			
	Anti-hVEGF-hlgG1		Human IgG1	100 μg	hvegf-mab1
Anti-hVEGF-hlgA2 Human lgA2 100 μg hvegf-mab7	Anti-hVEGF-hlgG4 (S228P)		Human IgG4 (S228P)	100 μg	hvegf-mab14
	Anti-hVEGF-hlgA2		Human IgA2	100 μg	hvegf-mab7

^{*}Larger quantities are available upon request *** Murine isotypes available, please visit our website: www.invivogen.com/anti-htnfa

Antibody isotype controls

As negative controls, InvivoGen provides several human, murine and rat antibody isotype controls targeting $E.\ coli\ \beta$ -galactosidase.

All antibody isotype controls are generated by recombinant DNA technology, produced in CHO cells and purified by affinity chromatography.

Human isotype controls	hlgA2, hlgG1, hlgG1 (N298A), hlgG2, hlgG3, hlgG4, hlgG4 (S228P)
Murine isotype controls	mlgG1, mlgG2a, mlgG2b
Rat isotype controls	rlgG1, rlgG2a, rlgG2b



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