New Product Release

- Newly Launched Recombinant Cytokines
- Therapeutic Targets for Neurodegenerative Diseases
- New Reagents for Therapeutic Targets
- Newly Launched Virus Research Reagents
**IL-21: A Modulator in Allergy, Cancer, and Viral Infections**

Interleukin 21 (IL-21) is an IL-2 family cytokine that strongly associates with inflammation and autoimmunity. It also exerts divergent effects on lymphoid cell leukemia and lymphomas. Clinical trials with IL-21 have yielded favorable results in cancer treatment, while the development of IL-21 inhibitors is in progress for treating autoimmune diseases. The biological functions of IL-21 are mediated via a heterodimeric receptor consisting of the IL-21R and the common γ-chain (γc/CD132) receptor.

**Human IL-21 Protein: 10584-HNAE**

- High-purity
- Low-endotoxin
- Tag-free
- HPLC-verified

Ability to induce Interferon-gamma secretion by human natural killer lymphoma NK-92 cells.

Batch-to-batch Consistency > 95 % as determined by SEC-HPLC

**IL-1 beta Primes Innate Immunity**

Interleukin-1β (IL-1β), along with IL-1α and IL-18, orchestrates the immune response through multiple downstream mechanisms. IL-1 beta transduces its signal through binding with the receptor IL1RI, which is complexed with the accessory protein IL1RACP. IL-1 beta signaling is negatively regulated by the decoy receptor IL1-RII and the receptor antagonist IL1RA.

**Human IL-1 beta Protein: 10139-HNAE**

- High-purity
- Low-endotoxin
- Tag-free
- HPLC-verified

Ability to induce Interferon gamma secretion by human natural killer lymphoma NK-92 cells.

Competitive bioactivity compared with other brand

> 95 % as determined by SEC-HPLC

**TNF-alpha: A Master Pro-inflammatory Cytokine**

Tumor Necrosis Factor-alpha (TNF-α) is a cytokine important in nearly all acute inflammatory reactions by acting as an amplifier of inflammation. TNF-α blockade has been used worldwide to treat inflammatory conditions, e.g., rheumatoid arthritis. Targeting TNF-α to treat cancer and cardiovascular diseases is also being evaluated in clinical trials. TNF-α exerts function by binding to TNFR-1 or TNFR-2, which belong to the TNF receptor superfamily. FAS, CD40, CD27, and RANK are also members of the TNF receptor superfamily.

**Human TNF-α Protein: 10602-HNAE**

- High-purity
- Low-endotoxin
- Tag-free
- HPLC-verified

Cytotoxicity assay using L929 mouse fibrosarcoma cells in the presence of the metabolic inhibitor actinomycin D.

Batch-to-batch Consistency > 95 % as determined by SEC-HPLC
Neurodegeneration is a neurological disorder with evolving atrophy and irreversible damage of neurons. Alzheimer’s (AD) and Parkinson’s (PD) are two of the most common neurodegenerative diseases. GDNF, NGF, and BDNF are growth factors responsible for the survival, maintenance, and regeneration of specific neurons, rendering them as therapeutics for neurodegenerative diseases (Fig.1). Clinical trials of GDNF (therapy for PD), NGF (therapeutic option for AD), and BDNF (therapeutic target for both AD and PD) are in progress. Therapies targeting neurotrophic factors and associated receptors can also be an effective approach for the less common neurodegenerative diseases such as Huntington’s (HD), amyotrophic lateral sclerosis (ALS), and Rett Syndrome.

**GDNF & Receptor Complex**

GDNF plays a significant role in the treatment of PD. GDNF binds to GFRα1 and Ret protein as a common signalling receptor shared with GDNF family ligands.

**GDNF Superfamily & Receptors**

GDNF superfamily proteins (artemin/ARTN, neurturin/NRTN, and persephin/PSPN) show protective and restorative effects in the developing and adult central nervous system (CNS). GDNF, Neurturin, Artemin, and Persephin bind to GFRα1, GFRα2, GFRα3, and GFRα4, respectively.
**Neurotrophins and Receptors**

Neurotrophins are growth factors that are essential for neuron development, survival, and maintenance. There are four neurotrophin family members: NGF, BDNF, neurotrophin 3, and neurotrophin 4. They can bind to specific Trk receptors with high affinity and p75NTR with low affinity, respectively, to elicit neurotrophic or pro-apoptotic signaling. NGF binds to TrkA; BDNF and neurotrophin 4 bind to TrkB; neurotrophin 3 binds to TrkC. NGF, BDNF and all the receptors are targets for therapy in AD. BDNF is also a therapeutic option for PD.

**NGF (Nerve Growth Factor)**

NGF is the first discovered member of neurotrophin family. It is important in the survival, growth, and maintenance of specific types of neurons.

**BDNF (Brain Derived Neurotrophic Factor)**

BDNF supports the survival and maintenance of sensory neurons, retinal ganglia, certain cholinergic neurons, spinal motor neurons, and some dopaminergic neurons.

---

**Neurotrophins and Receptors**

**NGF (Nerve Growth Factor)**

NGF is the first discovered member of neurotrophin family. It is important in the survival, growth, and maintenance of specific types of neurons.

**BDNF (Brain Derived Neurotrophic Factor)**

BDNF supports the survival and maintenance of sensory neurons, retinal ganglia, certain cholinergic neurons, spinal motor neurons, and some dopaminergic neurons.

---

**Human NT3 Protein**

**Mouse NT4 Protein**

---

**Trk Receptors**

<table>
<thead>
<tr>
<th>Cat#</th>
<th>Molecule</th>
<th>Species</th>
<th>Expressed Host</th>
<th>Purity</th>
<th>Tag</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>11073-H02H</td>
<td>TrkA</td>
<td>Human</td>
<td>HEK293 Cells</td>
<td>&gt;98%</td>
<td>C-hFc &amp; His</td>
<td>Active</td>
</tr>
<tr>
<td>11073-H07E1</td>
<td>TrkA</td>
<td>Human</td>
<td>E. coli</td>
<td>&gt;97%</td>
<td>N-His</td>
<td>Active</td>
</tr>
<tr>
<td>5103-M02H</td>
<td>TrkA</td>
<td>Mouse</td>
<td>HEK293 Cells</td>
<td>&gt;90%</td>
<td>C-hFc</td>
<td>Active</td>
</tr>
<tr>
<td>5103-M08H</td>
<td>TrkA</td>
<td>Mouse</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>70101-D01H</td>
<td>TrkA</td>
<td>Canine</td>
<td>HEK293 Cells</td>
<td>&gt;90%</td>
<td>N-HFc</td>
<td>Active</td>
</tr>
<tr>
<td>70011-D07H</td>
<td>TrkA</td>
<td>Canine</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>N-His</td>
<td>Active</td>
</tr>
<tr>
<td>80404-R02H</td>
<td>TrkA</td>
<td>Rat</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-hFc</td>
<td>Active</td>
</tr>
<tr>
<td>80404-R08H</td>
<td>TrkA</td>
<td>Rat</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>10047-H03H</td>
<td>TrkB</td>
<td>Human</td>
<td>HEK293 Cells</td>
<td>&gt;90%</td>
<td>C-hFc &amp; His</td>
<td>Active</td>
</tr>
<tr>
<td>10047-H06H</td>
<td>TrkB</td>
<td>Human</td>
<td>HEK293 Cells</td>
<td>&gt;97%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>50132-M08H</td>
<td>TrkB</td>
<td>Mouse</td>
<td>HEK293 Cells</td>
<td>&gt;98%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>70035-D08H</td>
<td>TrkB</td>
<td>Canine</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>80243-R08H</td>
<td>TrkB</td>
<td>Rat</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>10048-H03H</td>
<td>TrkC</td>
<td>Human</td>
<td>HEK293 Cells</td>
<td>&gt;98%</td>
<td>C-hFc &amp; His</td>
<td>Active</td>
</tr>
<tr>
<td>10048-H08H</td>
<td>TrkC</td>
<td>Human</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-His</td>
<td>Active</td>
</tr>
<tr>
<td>50320-M08H</td>
<td>TrkC</td>
<td>Mouse</td>
<td>HEK293 Cells</td>
<td>&gt;95%</td>
<td>C-His</td>
<td>Active</td>
</tr>
</tbody>
</table>

---

**Low Affinity Common Receptor to Neurotrophins: p75NTR**

**Human p75NTR Protein**

**Mouse p75NTR Protein**

---
New Reagents for Therapeutic Targets

**Cadherin-17**
Cadherin 17 (CDH17) is a novel therapeutic target for Gastrointestinal Cancers and a diagnostic marker for adenocarcinomas of the digestive system.

- **Human CDH17 Protein**
  - Ref: II360-M08H
  - Purity: > 88%
  - Expressed Host: HEK293 Cell

- **Cynomolgus CDH17 Protein**
  - Ref: 90147-C02H
  - Purity: > 85%
  - Expressed Host: HEK293 Cell

**IFNA2**
Interferon α2 (IFNa2) belongs to Type I interferon, which is a key cytokine of the innate immune response. Recombinant IFNa2 has been approved for the treatment of HBV, HCV, CML, Kaposi sarcoma, follicular lymphoma, RCC, melanoma, T cell lymphoma, multiple myeloma, and condylomata acuminata.

- **Human IFNA2 Protein**
  - Ref: 13833-H02H
  - Purity: > 95%
  - Expressed Host: HEK293 Cell
  - Sequence: Met1–Glu188

**GITR**
GITR is a member of the TNFR superfamily. It is activated by its ligand, GITRL. GITR can modulate both innate and adaptive immune responses. The GITR/GITRL interaction is involved in the pathogenesis of tumor, inflammation and autoimmune diseases.

- **Human GITR Protein**
  - Ref: 13643-H49H-B
  - Purity: > 95%
  - Expressed Host: HEK293 Cell
  - Modification: Biotinylated

**Host Cell Protein**
Chinese Hamster Ovarian (CHO) cell is the most commonly used host organism for recombinant bio-therapeutic production. CHO cells naturally express many types of host cell proteins (HCPs). HCP is known to elicit unwanted immune response against the drug.

- **Chinese hammer LPL Protein**
  - Ref: 5A7668-A08E
  - Purity: > 85%
  - Expressed Host: E. coli
  - Modification: Met1–Gly450

**RSPO2**
R-spondin2 (RSPO2) plays a vital role in the activation of the WNT/β-catenin pathway and oncogenesis.

- **Human RSPO2 Protein**
  - Ref: 13084-H02H
  - Purity: > 90%
  - Expressed Host: HEK293 Cell

**TLR3**
Toll Like Receptor 3 (TLR3) plays a fundamental role in pathogen recognition and the activation of innate immunity. Its activation regulates the immunomodulatory properties in some types of cancer cells.

- **Human TLR3 Protein**
  - Ref: 10190-H08B
  - Purity: > 95%
  - Expressed Host: Insect Cells
  - Sequence: Lys27–Ser711

**CD96**
CD96 functions as an inhibitory receptor expressed on T cells and NK cells. It is a promising cancer immunotherapy candidate. Together with co-inhibitory receptor TIGIT and co-stimulatory receptor CD226, CD96 forms a similar pathway as CD28/CTLA-4 to modulate anti-tumor immunity.

- **Human CD96 Protein**
  - Ref: 11202-H41H-B
  - Purity: > 95%
  - Expressed Host: HEK293 Cell
  - Modification: Biotinylated

**Recommended Reagents**

**Control Antibodies**
- Human IgG2, kappa Isotype Control (Biotin)  •  HG2K-B
- Human IgG1, kappa Isotype Control (Biotin)  •  HG1K-B
Newly Launched Virus Research Reagents

SARS-CoV-2 Research Tools

The ongoing COVID-19 pandemic has exerted long-lasting impacts worldwide for the past two years. Sino Biological keeps developing new SARS-CoV-2 reagents to support the diagnostics, detection, drug development, and vaccine development to the SARS-CoV-2 virus.

SARS-CoV-2 N Antibody Pairs

Please contact us for more detailed information.

SARS-CoV-2 Omicron Variants Proteins

Please contact us for more detailed information.

More SARS-CoV-2 Variants Proteins

Small Molecule Drug Target Proteins of SARS-CoV-2

Non-structural proteins of SARS-CoV-2 play vital roles through the viral replication cycle. They are highly conserved among the current variants, making them valuable targets for antiviral drug development. Sino Biological has developed a panel of non-structural proteins to support antiviral drug discovery and developments.