The immune system can be broken down into two distinct divisions, the innate or non-specific immune system and the specific or adaptive immune system. The innate immune system functions to control infections in a non-specific manner. The surface of the skin and mucous membranes act as physical barriers to prevent entry of pathogens, secretions such as saliva and lacrimal fluid contain lysozyme, while sebum on the skin surface contains anti-microbial proteins. In addition to these physical barriers, the body uses non-specific cellular defenses to clear infections once pathogens have entered the body. Phagocytes are able to detect surface markers expressed by bacteria in order to engulf and destroy them, while Natural Killer (NK) cells recognize virus infected cells and destroy them by inducing cell lysis. Anti-microbial proteins prevent the spread of infection as well. Viral infected cells produce Interferon which stimulates surrounding cells to produce anti-viral proteins. The complement cascade can either work with the adaptive immune system by triggering destruction of antibody tagged antigens or it can function as part of the innate immune system by binding to and destroying some bacteria directly, while at the same time enhancing the inflammatory response.

Following induction of the innate immune system, the body’s adaptive immune system is activated by the either free antigens or by the presentation of phagocytozed antigens by antigen presenting cells (APCs). The APCs activate both the cellular and the humoral branches of the adaptive immune system by activating T and B cells, respectively. Activated T cells can differentiate along one of two pathways. They can give rise to cytotoxic T cells, which act in conjunction with NK cells and macrophages to physically attack the antigen, or they can develop into T helper cells, which act to regulate the immune response of both antibody producing B cells and cytotoxic T cells. Activated B cells differentiate in response to co-stimulation from T helper cells to become either memory B cells or plasma cells. The memory B cells are responsible for immunologic memory and allow for a rapid response upon reexposure to an antigen. The plasma cells are responsible for secretion of soluble antibodies to the specific antigen.
Innate Immunity

Innate immunity is the defense mechanism that attacks an infection at onset. It does not adapt to specific pathogens to provide long-lasting protection as the adaptive immune system does. Most infectious agents that penetrate the body’s outer epithelial surfaces are quickly eliminated by the innate immune response preventing the appearance of disease symptoms. The word innate implies genetically determined mechanisms. Innate immunity functions in a two part mechanism. First, the pathogen is recognized by soluble proteins and cell-surface receptors. Serum proteins of the complement system are activated to covalently bind the pathogen. Next, effectors cells (phagocytic white blood cells) are recruited to engulf the pathogen via endocytosis and to destroy it in the phagosome.

Cytokines

Cytokines are signaling proteins produced by various cells for use in cellular communication in order to regulate immunity, inflammation and hematopoiesis. They act by binding membrane receptors, which then activate second messengers in order to alter gene expression. Cytokines interact via autocrine or paracrine action, although some work by endocrine action as well.

Tumor Necrosis Factors

Tumor Necrosis Factors (TNFs) are a family of cytokines that trigger apoptosis. TNF alpha is mainly secreted by macrophages and causes apoptosis of certain tumor cells lines. It also can stimulate cell proliferation and differentiation under certain conditions. TNF alpha and TNF beta are closely related as they share the same receptors and have similar cellular actions.

<table>
<thead>
<tr>
<th>Catalog#</th>
<th>Product</th>
<th>Host</th>
<th>Type</th>
<th>Application</th>
<th>Species</th>
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TNF alpha Antibody

Catalog# NB100-75387
Western blot analysis on E col-derived fusion protein using NB100-75387.

Species: Hu, Mu, Rt
Applications: ELISA, WB

How To Series CDs

Do you need to freshen up your IHC, RNAi, Western Blot or ELISA skills? A little fuzzy on the theory? Have students to teach? Check out our How To Series: Go to www.novusbio.com/support and click on Downloads to download our four presentations.

How To Series: Western Blot, ELISA IHC and RNAi
Interleukins

Interleukins are a diverse group of cytokines. IL-1 and IL-6 are released by macrophages and work with TNF alpha to induce inflammation at the onset of infection. IL-2 is produced by activated T cells and primarily functions in the adaptive immune response. IL-3 is a hematopoietic factor that promotes growth and differentiation of blood cells. CD4 TH2 cells secrete IL-4, IL-10 and IL-13 which function in antibody production. IL-12 is released by various immune cells and activates NK cells.

Read more about IL-1’s implication in Rheumatoid Arthritis on page 17.
IL-8

Interleukin 8 (IL-8), also known as CXCL8, is a chemotactic factor that recruits neutrophils from the blood to sites of infection in order to initiate the inflammatory response. IL-8 also recruits basophils and T cells, but not monocytes. Lung inflammation that is characteristic of cystic fibrosis is thought to be triggered by overproduction of IL-8.

IL-8R alpha Antibody
NLS806

Species: Hu
Applications: ICC, IHC, IHC-P

IL-8R beta Antibody
NLS804

Species: Hu
Applications: IHC-P

IL-8 (EP117Y) Antibody
NB110-57119

Western blot analysis on recombinant IL-8 protein using NB110-57119.

Interferons

Interferons are glycoproteins produced by the immune system in response to the presence of double-stranded RNA, a sign of a viral infection. There are three primary types of interferons: interferon beta (IFN-B), interferon alpha (IFN-A) and interferon gamma (IFN-gamma). IFN-A and IFN-B are type I interferons that are structurally and functionally related. IFN-A and IFN-B inhibit virus replication in infected cells. They appear to compete with one another for binding to common cell surface receptors, whereas IFN-gamma binds to a distinct receptor called IFN-alphaR. IFN-B can also regulate the production of IFN-gamma. IFN-gamma stimulates the expression of MHCs on antigen-presenting cells.

IFN-gamma (EP1109Y) Antibody
NB110-57108

Western blot analysis on IFN-gamma recombinant protein using NB110-57108.

IFN-alpha/beta R Antibody
NB100-92260

Immuno-histochemical analysis of human brain tissue using NB100-92260.

IFN-beta Antibody
NBP1-03004

Immuno-histochemical analysis of human lung using NBP1-03004.

Chemokines

Chemokines are small proteins involved in the inflammatory response. They are a type of cytokine that attract leukocytes to infection sites by acting as chemoattractants. Chemokines interact with the targeted leukocyte via GPCRs. This interaction causes two effects: first, the leukocyte’s adhesive properties change allowing movement from blood to tissue and secondly, the leukocyte’s movement to the center of infection is driven via a chemokine gradient. Chemokines are divided into two major subfamilies, which are defined based on their pairs of cysteine residues. CC chemokines contain adjacent cysteine residues, whereas CXC chemokines’ cysteines are separated by a different amino acid.

MIP-1 alpha

Macrophage inflammatory protein-1 alpha (MIP-1 alpha), also known as CCL3, is involved in the acute inflammatory state. Chemokine receptors, CCR1, CCR2, CCR3 and CCR5 recognize the two isoforms of MIP-1 alpha in order to inhibit HIV infection. MIP-1 alpha is also capable of inhibiting the proliferation of hematopoietic stem cells in vitro and in vivo.
**MIP-1 beta**

Macrophage inflammatory protein-1 beta (MIP-1 beta), also known as CCL4, promotes accumulation of lymphocyte, macrophages, monocytes and NK cells during inflammation via its chemotactic properties. MIP-1 plays a role in HIV-1 by blocking or down-regulating the receptor CCR5.

**RANTES**

RANTES, also known as CCL5, is a chemoattractant for blood monocytes, memory T helper cells and eosinophils. RANTES triggers the release of histamine from basophils and also activates eosinophils. Via binding to the chemokine receptors, CCR1, CCR3, CCR4 and CCR5, it acts to suppress HIV.

**Chemokine Receptors**

Chemokine receptors are GPCRs that mediate the migration and activation of leukocytes. Four families of chemokine receptors have been identified that correspond with the chemokines to which they bind: CXC, CC, CX3C and XC. Recently, chemokine receptors have been shown to be implicated in several diseases including malaria, allergy, psoriasis and atherosclerosis. CCR4 and CCR5 have been shown to be implicated in HIV, as they are used to preferentially enter macrophages or T cells.

**CCR2**

C-C chemokine receptor type 2 (CCR2) has been found to be a monocyte chemoattractant protein-specific receptor. CCR2 transduces these signals by increasing intracellular levels of calcium ions. It also functions as an alternative coreceptor with CD4 for HIV-1 infection. CCR2 is present in two isoforms and is expressed widely throughout the body.

**Additional Chemokine Antibodies are available on our website, www.novusbio.com**
**CCR5**

C-C chemokine receptor type 5 (CCR5), also known as CD195, is a receptor for various inflammatory chemokines, including MIP-1 alpha, MIP-1 beta and RANTES. CCR5 may play a role in the control of granulocytic lineage proliferation or differentiation. It also is a major coreceptor for human HIV infection.

---

Toll-Like Receptors

Receptors on the surface of macrophages, including Toll-Like Receptors (TLRs), sense pathogen components and tell the macrophage to produce and secrete cytokines. These cytokines then recruit other cells to defend the infected tissue. Many TLR families exist, each with varying specificity for microbial products, however TLR4 is the most thoroughly researched of the receptor family. The only TLR known to directly bind products is TLR5, which binds bacterial flagellin. All TLRs trigger an intercellular signaling pathway that leads to the translocation of the transcription factor nuclear factor kappa B (NFκB) from the cytoplasm to the nucleus. Once present in the nucleus, NFκB directs the transcription of genes for inflammatory cytokines.

<table>
<thead>
<tr>
<th>Catalog#</th>
<th>Product Host</th>
<th>Type</th>
<th>Application Species</th>
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**TLR9 (1E8) Antibody**

**H00054106-M03**

- **Immunofluorescence of HeLa cells using H00054106-M03.**
- **Species:** Hu
- **Applications:** ELISA, IF, WB

**TLR7 Antibody**

**NB100-80844**

- **Immunohistochemical analysis of cerebellum using NB100-80844.**
- **Species:** Hu, Mu
- **Applications:** ICC, IHC, WB

**TLR7 (4G6) Antibody**

**H00051284-M07**

- **Western blot analysis on Daoy using H00051284-M07.**
- **Species:** Hu
- **Applications:** ELISA, WB
Toll-Like Receptor 4 (TLR4) forms one part of the lipopolysaccharide (LPS) receptor, a multi-protein complex that detects LPS, a major cell-surface component of Gram-negative bacteria and the major endotoxin responsible for septic shock.

**TLR4 Antibody**
- **NB100-56581**
  - **Species:** Hu, Mu
  - **Applications:** ICC, IHC, WB
  - Immuno-histochemical analysis of normal prostate sections using NB100-56581.

**CD14**
CD14 binds LPS after it is released from bacterial surfaces and cooperates with MD2 and TLR4 to mediate the immune response. This pathway eventually leads to NFκB activation, cytokine secretion and the inflammatory response. CD14 is expressed strongly on the surface of monocytes and weakly on the surface of granulocytes. It is also expressed by most tissue macrophages.

**CD14 Antibody**
- **NB100-2907**
  - **Species:** Hu
  - **Applications:** ELISA, WB
  - Western blot analysis of human lymph node lysate using NB100-2907.

**MYD88**
Myeloid differentiation marker 88 (MYD88) is an adapter molecule for the Toll-Like 1 receptor and is involved in the inflammatory response. MYD88 associates with and recruits IRAK to the IL-1 receptor complex, which leads to further activation of NFκB.

**MYD88 Antibody**
- **NB300-946**
  - **Species:** Ca, Hu, Mu, Mk, Rt
  - **Applications:** ELISA, IHC, IHC-P, WB
  - Immuno-histochemical analysis of human tonsil using NB300-946.

**IRAK4**
Interleukin-1 receptor associated kinase 4 (IRAK4) phosphorylates IRAK1 and overexpression leads to activation of NFκB. Individuals that lack IRAK4 are unable to initiate a proper immune response to viruses and bacteria.

**IRAK4 Antibody**
- **NB100-1527**
  - **Species:** Hu, Mu, Mk
  - **Applications:** ELISA, WB
  - Western blot analysis of Hela lysate using NB100-1527.

- **NB100-1528**
  - **Species:** Hu
  - **Applications:** ICC, IHC-P, WB
  - Immuno-histochemical analysis of human spleen using NB100-1528.

- **NB100-02628**
  - **Species:** Hu
  - **Applications:** ICC, IHC-P, WB
  - Immuno-histochemical analysis of human testis using NB100-02628.

- **H00051135-M04**
  - **Species:** Hu
  - **Applications:** ELISA, IHC-P, WB
Adaptive Immunity

The unique function of the adaptive immune response provides the body with the ability to defend itself against specific invaders. Through complex mechanisms of antigen recognition, the body can ward off infection by attacking only specific pathogens while leaving the surrounding tissues alone. The body produces countless types of immunoglobulins and T cell receptors in response to infection. These remain latent in the system for many years after initial infection, thus allowing the body to effectively defeat diseases in the event of subsequent reexposure.

B Cells

B cells produce soluble immunoglobulins that recognize specific antigens. Upon binding to their target, these tags allow for the recruitment of phagocytes and the destruction of the pathogen. Immunoglobulins are capable of binding an intact pathogen in extracellular space, specifically targeting carbohydrate or amino acid groups on the surface of the invading molecule.

CD4 TH2 Helper Cells

These cell types perform a critical role in the activation of B cells. Without co-stimulation, there is often not enough signal strength to cause the naïve B cells to differentiate. Helper/effector T cells use cytokines and direct interaction with B cells to promote B cell proliferation.

B Cell Coreceptors

Another important part of B cell activation is the B cell coreceptor, which aids in binding the antigen and aligning both the receptor and coreceptor. This alignment increases the relative proximity of cytoplasmic tyrosine kinases with CD19, which upon phosphorylation begins to mobilize internal signaling factors.
**TLR Antigens**

Thymus-independent (TI) antigens are capable of binding B cell receptors and activating naïve B cells without the assistance of CD4 T cells. These antigens are also capable of binding other receptors on the B cell surface, such as TLRs, to activate B cell proliferation.

**CD14 Antibody**

**NB500-444**
- **Applications:** ELISA, FACS, IP, WB
- **Surface staining of human peripheral blood cells using NB500-444.**

**TLR4 Antibody**

**NB100-56581**
- **Immuno-histochemical analysis of Ramos using NB100-56581.**

**CD45R (RA3-6B2) Antibody**

**NB100-77420**
- **Applications:** FACS, IHC, IP
- **C57BL/6 mouse splenocytes stained with NB100-77420.**

**Antibody Grants**

**WANT YOUR ANTIBODY PRODUCED FOR FREE?**

Visit our website, www.novusbio.com and fill out the Antibody Grant Sheet for a chance to receive 2 mgs of FREE antibody!

Grant Award Date: 1 Award selected on the 15th of every month. Awardees will receive a 0.2 mg test sample of affinity purified rabbit sera. (Typical antibody production takes 4-5 months). If the product works and you supply the necessary documentation, you will receive 2 mgs of affinity purified antibody in exchange for product feedback. Novus reserves the right to sell the antibody produced by the grant. Submit by the end of the month to be selected in the following month’s drawing by fax (below) or email (novus@novusbio.com).
T Cells
These lymphocytes are an important part of the adaptive immune system. They are functionally different from B cells because they bind short peptides that have been assembled in a MHC molecule. This response to antigen processing makes T cells antigen-specific. Unlike B cells that produce soluble antibodies, T cells have a more diverse role which often includes interaction with other cell types.

T Cell Receptors
T Cell Receptors (TCRs) are membrane-bound glycoprotein complexes generally found on the surface of T cells. They are similar to a single antigen-binding portion of immunoglobulins formed in B cells.

Adhesion Molecules
The movement of naïve T cells into secondary lymphoid tissue requires interaction of adhesion molecules on the surface of the T cells with adhesion molecules on the surface of endothelial cells. Molecules, such as selectins and vascular addressins, aid in homing of the T cells, while integrins strengthen the bond once the T cell and endothelium have come into contact.

Activating Proteins
Activation of naïve T cells requires a co-stimulatory signal from an antigen-presenting cell (APC). Expression of the required activation molecules only occurs in the event of an infection which activates the innate immune system causing upregulation of the B7 genes.
Gene Transcription

Upon antigen activation of T cell signals, by both T cell receptors and co-receptors. These function to alter the transcription of genes that in turn increase T cell proliferation.

LCK (Y123) Antibody
NB110-57284

NFAT4 Antibody
NB100-92190

IL-2 Antibody
NB110-60926

Species: Hu
Applications: FACS, ICC, IHC, IP, WB

Western Blot analysis of HeLa cells using NB100-92190.

Staining of lymphocytes in human peripheral blood mononuclear cell (PBMC) cultures after PMA and ionomycin stimulation using NB110-60926.

Cytotoxic T Cells

Cytotoxic T cells function to induce apoptosis of infected cells. This type of programmed cell death ensures that pathogen production is halted and that infectious molecules are not released back into the bloodstream.

Perforin (dG9) Antibody
NB100-77862

GNLY Antibody
H00010578-B01

Fas Ligand Antibody
NB120-21233

Species: Hu, Mu
Applications: ELISA, WB

Whole blood lymphocytes stained intracellularly using NB100-77862.

Western Blot analysis of transfected 293T cell line (Lane 1) using H00010578-B01. Lane 2 is a non-transfected lysate.

Immunohistochemical analysis of human prostate stained using NB120-21233.

CD4 T Cells

When activated, CD4 T cells acquire helper functions. These functions range from production of soluble cytokines to direct interaction of surface molecules that activate other types of cells. CD4 helper cells can differentiate into either TH1 or TH2 cells. TH1 cells play an important role in macrophage activation and facilitate the production of opsonizing antibodies. TH2 cell are mostly necessary for B cell differentiation and for the formation of neutralizing antibodies. TH2 cells also serve to regulate a TH1 response which can damage surrounding tissues.

IL-10 (EP1115Y) Antibody
NB110-57114

IL-13 (JES10-5A2) Antibody
NB200-594

LTA Antibody
H00004049-D01P

TNF beta (359-238-8) Antibody
NB100-78165

TNF alpha Antibody
NB100-75387

IL-6 Antibody
NB600-1131

TNF alpha Antibody
NB100-75387

Species: Hu, Mu, Rt
Applications: WB

Western blot analysis of recombinant protein using NB110-57114.

Sandwich ELISA of NB200-594 paired with NB100-78150.

Western Blot analysis in transfected 293T cell line (Lane 1) using H00004049-D01P. Lane 2 is a non-transfected lysate.

Western blot analysis of IL-6-GST fusion protein using NB600-1131.

Sandwich ELISA of NB100-78165 paired with NB100-78167.

Western blot analysis on E coli-derived fusion protein using NB100-75387.

Species: Hu
Applications: ELISA, WB

Species: Hu
Applications: ELISA, WB

Species: Hu
Applications: ELISA, WB

Species: Hu
Applications: ELISA, WB

Species: Hu
Applications: ELISA
MHCs

Major histocompatibility complex (MHC) molecules are incredibly important to ensure that the appropriate type of T cell is activated in response to invasion by a foreign pathogen. There are two classes of MHC molecules: MHC class I, which present intracellular antigens to CD8 T cells, and MHC class II, which present extracellular antigens to CD4 cells.

MHC Class I

**HLA-A Antibody**
H00003105-B01P

Western blot analysis on human spleen using H00003105-B01P.

*Species: Hu*
*Applications: ELISA, WB*

**HLA-B Antibody**
H00003106-B01P

Western blot analysis on human spleen using H00003106-B01P.

*Species: Hu*
*Applications: ELISA, WB*

**HLA-C Antibody**
H00003107-B01P

Western blot analysis in transfected 293T cell line (Lane 1) using H00003107-B01P. Lane 2 is a non-transfected lysate.

*Species: Hu*
*Applications: ELISA, WB*

MHC Class II

**CD51 (NKI-M9) Antibody**
NB100-78105

Human melanoma cell line M21 stained using NB100-78105.

*Species: Hu*
*Applications: ELISA, FACS, IHC-Fr, IP*

**CD104 (58XB4) Antibody**
NB100-78102

Human colon carcinoma cell line (HT29) stained using NB100-78102.

*Species: Hu*
*Applications: ELISA, FACS, IHC-Fr, IP*

**HLA-DR (L243) Antibody**
NB100-77855

Human peripheral blood lymphocytes stained using NB100-77855.

*Species: Hu, Bb, Mk, Ca*
*Applications: FACS, IHC-Fr, IP, WB*

Immunoglobulins

The vast number of antibodies that can be produced is the direct result of gene rearrangement in the formation of immunoglobulins. After V(D)J recombination, alternative splicing allows for the formation of IgM and IgD antibodies. These immunoglobulins are the only isotypes present on naïve B cells. Once the B cell encounters an antigen, the other isotypes (IgA, IgE, IgG) can be produced. Immunoglobulins can be either membrane-bound acting as the B cell receptor for antigens, or soluble, thus permitting secretion to bind antigens and facilitate the destruction of pathogens.

**IgM Antibody**
NB120-17899

Immunohistochemical analysis of human tonsil using NB120-17899.

*Species: Hu*
*Applications: IHC*

**IgA Antibody**
NB120-2411

Immunohistochemical analysis of human tonsil stained using NB120-2411.

*Species: Hu*
*Applications: IHC*

Other Available Immunoglobulins:
IgG • NB7475
IgD • NB120-17184
IgE • NB 500-471
Kappa light chain • NB120-940
Lambda light chain • NB 120-4211

Abnova, Acris, biosensis, Innova

Novus distributes for these companies:
Clusters of Differentiation (CD) are a series of surface proteins on leukocytes that serve to differentiate the many types of white blood cells. CD proteins serve as receptors and ligands; important examples include CD4 and CD8 on T lymphocytes which serve to regulate the adaptive immune response. Some CD proteins regulate cell signaling, while others ensure cell adhesion, an important aspect of adaptive immunity.

CD11b, also known as Integrin alpha-M, is a commonly used microglial marker. It is involved in various adhesive interactions of monocytes, macrophages and granulocytes. CD11b also mediates the uptake of complement coated particles and is a receptor for fibrinogen, factor X and ICAM1.

**CD11b/c Antibody**

CD11b, also known as Integrin alpha-M, is a commonly used microglial marker. It is involved in various adhesive interactions of monocytes, macrophages and granulocytes. CD11b also mediates the uptake of complement coated particles and is a receptor for fibrinogen, factor X and ICAM1.
Autoimmune Disorders

NIH estimates that 23.5 million Americans suffer from autoimmune diseases. Although these diseases are rare, their prevalence is rising. Autoimmune diseases are disorders that occur due to autoimmunity, an inappropriate immune response against one’s own organs, tissues or cells. Autoimmunity occurs naturally in everyone to some degree, however autoimmune diseases arise as a pathological consequence. There are two types of autoimmune disorders: systemic autoimmune diseases and localized autoimmune diseases. As the names imply, the former causes damage of many organs, while the later cause damage of a single organ or tissue. Heritability and environmental factors are the two leading causes of autoimmune diseases.

Multiple Sclerosis

Multiple Sclerosis (MS) is an inflammatory disease of the central nervous system that is thought to be initiated by self-reactive T cells. Activate T cells, capable of crossing the blood-brain barrier, target myelin basic protein, a major component of the myelin sheath, causing sclerotic plaques. Activated macrophages are present in these plaques and release proteases and cytokines which are the direct cause of demyelination. Research has shown that T cells derived from MS patients recognize proteins encoded by both herpes simplex virus and Epstein-Barr virus, however MS also has a strong genetic component.

Myelin Basic Protein

Myelin Basic Protein (MBP) plays a role in the formation of and stabilization of myelin sheaths. Smaller isoforms may play an important role in remyelination of axons affected by MS. Some studies have shown a link between the MBP gene and a predisposition to MS.

Epstein-Barr Virus

The Epstein-Barr Virus (EBV) is a member of the Herpes virus family and is one of the most common and successful human viruses. This virus persists within B cells and is controlled by virus-specific T cells.

Studies suggest that patients with MS may carry a population of T cells that overreact to EBV. Thus, high levels of antibodies to EBV are an indicator of increased risk for developing MS.

Proteolipid Protein

Proteolipid Protein (PLP) is an abundant protein found in myelin of the central and peripheral nervous systems. It stabilizes myelin by preventing lipid bilayer fusion. PLP is one of the most studied myelin proteins due to the prevalence of PLP mutations in humans and animals.
Type 1 Diabetes

Type 1 Diabetes is a disease in which the immune system destroys insulin-producing beta cells in the pancreas. Current research shows that this attack is mediated by killer T cells. Apoptosis of beta cells occurs several months prior to symptomatic onset, thus type 1 diabetes is sometimes referred to as a silent killer. Studies show that B lymphocytes also play a role in pathogenesis, however their role is less clear.

Insulin

Insulin is a polypeptide hormone that enhances membrane transport of glucose and other molecules, as well as promoting glycogen storage, formation of triglycerides and synthesis of proteins and nucleic acids. Deficiencies in insulin result in type 1 diabetes.

Insulin (E2E3) Antibody
NB120-9569

Immuno-histochemical analysis of human pancreas using NB120-9569.

Species: Bv, Hu, Po, Rt, Rb
Applications: ELISA, ICC, IHC, WB

Insulin (C-PEP-01) Antibody
NB500-413

Immuno-histochemical analysis of human pancreas using NB500-413.

Species: Hu
Applications: ELISA, ICC, IHC, RIA

Insulin (D3E7 (5B6/6)) Antibody
NB100-64697

Immuno-histochemical analysis of human pancreas using NB100-64697.

Species: Ri, Hu
Applications: ELISA, IHC-Fr, IHC-P

IA2

IA2 belongs to the protein tyrosine phosphatase family. IA2 is an autoantigen reactive with type 1 diabetes patients’ sera, thus it may be a potential target of autoimmunity in type 1 diabetes.

IA2 Antibody
NB100-92367

Western blot analysis on extracts from K562 cells using NB100-92367.

Species: Hu
Applications: ELISA, WB

CD137 Antibody
NB120-15299

Immuno-histochemical analysis of human pancreas using NB120-15299.

Species: Hu, Rt
Applications: ELISA, ICC, IHC

GAD

Glutamic acid decarboxylase (GAD) catalyzes the conversion of glutamate to GABA, a major inhibitory neurotransmitter in the CNS. GAD exists as two isoforms, GAD65 and GAD67. GAD65 is thought to be the major autoantigen and an autoreactive T cell target in type 1 diabetes.

GAD65 Antibody
NB120-15299

Immuno-histochemical analysis of human pancreas using NB120-15299.

Species: Hu, Rt
Applications: IHC

GAD1/2 Antibody
NB100-92033

Immuno-histochemical analysis of human lung carcinoma tissue using NB100-92033.

Species: Hu, Mu
Applications: ELISA, IHC, WB

NEW


CD137

CD137 belongs to the tumor necrosis factor receptor family and is expressed on activated T cells. The functions of CD137 in T cells include regulating activation, proliferation and apoptosis. Studies suggest that CD137 plays a significant role in the development of and genetic predisposition to type 1 diabetes. CD137 antibody therapy can suppress the development of type 1 diabetes in mice.

CD137 Antibody
NB100-92367

Western blot analysis on extracts from K562 cells using NB100-92367.

Species: Hu
Applications: ELISA, WB

GAD65 Antibody
NB120-15299

Immuno-histochemical analysis of human pancreas using NB120-15299.

Species: Hu, Rt
Applications: IHC

GAD1/2 Antibody
NB100-92033

Immuno-histochemical analysis of human lung carcinoma tissue using NB100-92033.

Species: Hu, Mu
Applications: ELISA, IHC, WB
Rhuematoid Arthritis

Rhuematoid arthritis (RA) is an autoimmune disease that causes chronic inflammation of the joints which eventually leads to their destruction. In RA affected joints, lymphocytes are activated causing cytokines, such as tumor necrosis factor (TNF) and interleukin-1 (IL-1), to be expressed in the inflamed areas. T cells from RA patients recognize cartilage protein and a protein incoded by the bacterium that causes tuberculosis, thus suggesting that mycobacterial infection may trigger RA. The incidence of RA has a negative correlation with thymus function. Patients with RA inevitably experience pain alongside the swelling and tenderness associated with rheumatoid joint inflammation. IL-1 and TNF strongly induce the production of PGE2, leukotrienes and platelet-activating factor, which are involved in the pain mechanism.

TNF

Tumor necrosis factor (TNF) is a cytokine produced by macrophages that causes the inflammation associated with RA. Medications currently available to combat RA function by binding TNF and preventing it from functioning.

IL-1

Interleukin-1 (IL-1) is a pivotal cytokine involved in the pathogenesis of RA. IL-1 alpha and IL-1 beta bind the same cell surface receptor, have 25% amino acid sequence identity, and elicit similar biological responses. IL-1 works with IL-6 and TNF alpha to induce early onset inflammatory responses. IL-1 also activates chondrocytes to stimulate cartilage breakdown, activates osteoclasts to initiate bone resoprtion, and induces fibroblast proliferation to initiate synovial pannus formation.


