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CD40-CD40 ligand interactions in experimental allergic encephalomyelitis and multiple sclerosis

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J D Laman (/search?author1=J+D+Laman&sortspec=date&submit=Submit),
R J Noelle (/search?author1=R+J+Noelle&sortspec=date&submit=Submit),
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Abstract

We investigated the role of CD40-CD40 ligand (CD40L) interactions in multiple sclerosis (MS) and experimental allergic encephalomyelitis (EAE). Activated helper T cells expressing CD40L (gp39) surface protein were found in MS patient brain sections, but not in brain tissue sections of normal controls or patients with other neurological disease. CD40L-positive cells were co-localized with CD40-bearing cells in active lesions (perivascular infiltrates). Most of these CD40-bearing cells proved to be of the monocytic lineage (macrophages or microglial cells), and relatively few were B cells. To functionally evaluate CD40-CD40L interactions, EAE was elicited in mice by means of proteolipid-peptide immunization. Treatment with anti-CD40L monoclonal antibody completely prevented the development of disease. Furthermore, administration of anti-CD40L monoclonal antibody, even after disease onset, shortly before maximum disability score was reached led to dramatic disease reduction. The presence of helper T cells expressing CD40L in brain tissue of MS patients and EAE animals, together with the functional evidence provided by successful experimental prevention and therapy in an animal model, indicates that blockade of CD40-CD40L-mediated cellular interactions may be a method for interference in active MS.

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(/external-ref?tag_url=http://www.pnas.org/cgi/content/l CD40%20ligand%20interactions%20in%20 20encephalomyelitis%20and%20multiple% 20et%20al.%2093%20%286%29%3A%2024 +&doi=&link_type=CITEULIKE)

(/external-ref?tag_url=http://www.pnas.org/cgi/content/l CD40%20ligand%20interactions%20in%20 20encephalomyelitis%20and%20multiple% 20et%20al.%2093%20%286%29%3A%2024 +&doi=&link_type=DEL_ICIO_US)

(/external-ref?tag_url=http://www.pnas.org/cgi/content/l CD40%20ligand%20interactions%20in%20 20encephalomyelitis%20and%20multiple%

Abstract (http://www.jimmunol.org/cgi/content/abstract/187/8/4119) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/187/8/4119) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/187/8/4119)

Experience with lentivirus-mediated CD40 gene silencing in a mouse model of Graves' disease
J Endocrinol (Journal of Endocrinology) 2011 208 (3) 285-291
Abstract (http://joe.endocrinology-journals.org/cgi/content/abstract/208/3/285) | Full Text (HTML) (http://joe.endocrinology-journals.org/cgi/content/full/208/3/285) | Full Text (PDF) (http://joe.endocrinology-journals.org/cgi/reprint/208/3/285)

Signaling Pathways in the Activation of Mast Cells Cocultured with Astrocytes and Colocalization of Both Cells in Experimental Allergic Encephalomyelitis
J. Immunol. (The Journal of Immunology) 2010 185 (1) 273-283
Abstract (http://www.jimmunol.org/cgi/content/abstract/185/1/273) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/185/1/273) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/185/1/273)

Activation of Tolerogenic Dendritic Cells in the Tumor Draining Lymph Nodes by CD8+ T Cells Engineered to Express CD40 Ligand
J. Immunol. (The Journal of Immunology) 2010 184 (7) 3394-3400
Abstract (http://www.jimmunol.org/cgi/content/abstract/184/7/3394) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/184/7/3394) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/184/7/3394)

Deficient CD40-TRAF6 signaling in leukocytes prevents atherosclerosis by skewing the immune response toward an antiinflammatory profile
JEM (Journal of Experimental Medicine) 2010 207 (2) 391-404
Abstract (http://jem.rupress.org/cgi/content/abstract/207/2/391) | Full Text (HTML) (http://jem.rupress.org/cgi/content/full/207/2/391) | Full Text (PDF) (http://jem.rupress.org/cgi/reprint/207/2/391)

Roles of Sema4D-Plexin-B1 Interactions in the Central Nervous System for Pathogenesis of Experimental Autoimmune Encephalomyelitis
J. Immunol. (The Journal of Immunology) 2010 184 (3) 1499-1506
Abstract (http://www.jimmunol.org/cgi/content/abstract/184/3/1499) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/184/3/1499) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/184/3/1499)

Soluble CD40 Ligand Impairs the Function of Peripheral Blood Angiogenic Outgrowth Cells and Increases Neointimal Formation After Arterial Injury
Circulation (Circulation) 2010 121 (2) 315-324
Abstract (http://circ.ahajournals.org/cgi/content/abstract/121/2/315) | Full Text (HTML) (http://circ.ahajournals.org/cgi/content/full/121/2/315) | Full Text (PDF) (http://circ.ahajournals.org/cgi/reprint/121/2/315)

IL-1R Signaling within the Central Nervous System Regulates CXCL12 Expression at the Blood-Brain Barrier and Disease Severity during Experimental Autoimmune Encephalomyelitis
J. Immunol. (The Journal of Immunology) 2009 183 (1) 613-620
Abstract (http://www.jimmunol.org/cgi/content/abstract/183/1/613) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/183/1/613) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/183/1/613)

A Pivotal Role for CD40-Mediated IL-6 Production by Dendritic Cells during IL-17 Induction In Vivo
J. Immunol. (The Journal of Immunology) 2009 182 (5) 2808-2815
Abstract (http://www.jimmunol.org/cgi/content/abstract/182/5/2808) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/182/5/2808) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/182/5/2808)

CD40-CD40L cross-talk integrates strong antigenic signals and microbial stimuli to induce development of IL-17-producing CD4+ T cells
Proc. Natl. Acad. Sci. USA (PNAS) 2009 106 (3) 876-881
Abstract (/cgi/content/abstract/106/3/876) | Full Text (HTML) (/cgi/content/full/106/3/876) | Full Text (PDF) (/cgi/reprint/106/3/876)

CD40 Mediates Retinal Inflammation and Neurovascular Degeneration
J. Immunol. (The Journal of Immunology) 2008 181 (12) 8719-8726
Abstract (http://www.jimmunol.org/cgi/content/abstract/181/12/8719) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/181/12/8719) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/181/12/8719)

The CD40-TRAF6 axis is the key regulator of the CD40/CD40L system in neointima formation and arterial remodeling
Blood (Blood) 2008 111 (9) 4596-4604

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Research Article (/search?
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Effects of interferon-{beta} on co-signaling molecules: upregulation of CD40, CD86 and PD-L2 on monocytes in relation to clinical response to interferon-{beta} treatment in patients with multiple sclerosis

Mult Scler (Multiple Sclerosis) 2008 14 (2) 166-176

Abstract (http://msj.sagepub.com/cgi/content/abstract/14/2/166) | Full Text (PDF) (http://msj.sagepub.com/cgi/reprint/14/2/166)

Leptin Induces CD40 Expression through the Activation of Akt in Murine Dendritic Cells

J Biol Chem (Journal of Biological Chemistry) 2007 282 (38) 27587-27597

Abstract (http://www.jbc.org/cgi/content/abstract/282/38/27587) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/282/38/27587) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/282/38/27587)

Antigen-Specific Suppression of Experimental Autoimmune Encephalomyelitis by a Novel Bifunctional Peptide Inhibitor

J. Pharmacol. Exp. Ther. (Journal of Pharmacology and Experimental Therapeutics) 2007 322 (2) 879-886

Abstract (http://jpet.aspetjournals.org/cgi/content/abstract/322/2/879) | Full Text (HTML) (http://jpet.aspetjournals.org/cgi/content/full/322/2/879) | Full Text (PDF) (http://jpet.aspetjournals.org/cgi/reprint/322/2/879)

Simvastatin inhibits IFN-{gamma}-induced CD40 gene expression by suppressing STAT-1{alpha}

J. Leukoc. Biol. (Journal of Leukocyte Biology) 2007 82 (2) 436-447

Abstract (http://www.jleukbio.org/cgi/content/abstract/82/2/436) | Full Text (HTML) (http://www.jleukbio.org/cgi/content/full/82/2/436) | Full Text (PDF) (http://www.jleukbio.org/cgi/reprint/82/2/436)

Legionella pneumophila Infection Up-Regulates Dendritic Cell Toll-Like Receptor 2 (TLR2)/TLR4 Expression and Key Maturation Markers

Infect. Immun. (Infection and Immunity) 2007 75 (6) 3205-3208

Abstract (http://iai.asm.org/cgi/content/abstract/75/6/3205) | Full Text (HTML) (http://iai.asm.org/cgi/content/full/75/6/3205) | Full Text (PDF) (http://iai.asm.org/cgi/reprint/75/6/3205)

Death Ligands and Autoimmune Demyelination

Neuroscientist (The Neuroscientist) 2006 12 (4) 305-316

Abstract (http://nro.sagepub.com/cgi/content/abstract/12/4/305) | Full Text (PDF) (http://nro.sagepub.com/cgi/reprint/12/4/305)

CD40 Expression by Microglial Cells Is Required for Their Completion of a Two-Step Activation Process during Central Nervous System Autoimmune Inflammation

J. Immunol. (The Journal of Immunology) 2006 176 (3) 1402-1410

Abstract (http://www.jimmunol.org/cgi/content/abstract/176/3/1402) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/176/3/1402) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/176/3/1402)

LPS induces CD40 gene expression through the activation of NF-{kappa}B and STAT-1{alpha} in macrophages and microglia

Blood (Blood) 2005 106 (9) 3114-3122

Abstract (http://bloodjournal.hematologylibrary.org/cgi/content/abstract/106/9/3114) | Full Text (HTML) (http://bloodjournal.hematologylibrary.org/cgi/content/full/106/9/3114) | Full Text (PDF) (http://bloodjournal.hematologylibrary.org/cgi/reprint/106/9/3114)

Minocycline attenuates T cell and microglia activity to impair cytokine production in T cell-microglia interaction

J. Leukoc. Biol. (Journal of Leukocyte Biology) 2005 78 (1) 135-143

Abstract (http://www.jleukbio.org/cgi/content/abstract/78/1/135) | Full Text (HTML) (http://www.jleukbio.org/cgi/content/full/78/1/135) | Full Text (PDF) (http://www.jleukbio.org/cgi/reprint/78/1/135)

Disruption of CD40/CD40-Ligand Interactions in a Retinal Autoimmunity Model Results in Protection without Tolerance

J. Immunol. (The Journal of Immunology) 2005 175 (1) 124-130

Abstract (http://www.jimmunol.org/cgi/content/abstract/175/1/124) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/175/1/124) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/175/1/124)

Anatomical and Cellular Requirements for the Activation and Migration of Virus-Specific CD8+ T Cells to the Brain during Theiler's Virus Infection

J. Virol. (Journal of Virology) 2005 79 (5) 3063-3070

Abstract (http://jvi.asm.org/cgi/content/abstract/79/5/3063) | Full Text (HTML) (http://jvi.asm.org/cgi/content/full/79/5/3063) | Full Text (PDF) (http://jvi.asm.org/cgi/reprint/79/5/3063)

Decay-Accelerating Factor (CD55) Is Expressed by Neurons in Response to Chronic but Not Acute Autoimmune Central Nervous System Inflammation Associated with Complement Activation

J. Immunol. (The Journal of Immunology) 2005 174 (4) 2353-2365

Abstract (http://www.jimmunol.org/cgi/content/abstract/174/4/2353) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/174/4/2353) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/174/4/2353)

TNF Receptor-Associated Factor 6 Is an Essential Mediator of CD40-Activated Proinflammatory Pathways in Monocytes and Macrophages

J. Immunol. (The Journal of Immunology) 2005 174 (2) 1081-1090

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Differential Induction of IL-1{beta} and TNF by CD40 Ligand or Cellular Contact with Stimulated T Cells Depends on the Maturation Stage of Human Monocytes

J. Immunol. (The Journal of Immunology) 2004 173 (2) 1292-1297

Abstract (http://www.jimmunol.org/cgi/content/abstract/173/2/1292) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/173/2/1292) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/173/2/1292)

FcR Interactions Do Not Play a Major Role in Inhibition of Experimental Autoimmune Encephalomyelitis by Anti-CD154 Monoclonal Antibodies

J. Immunol. (The Journal of Immunology) 2004 173 (2) 993-999

Abstract (http://www.jimmunol.org/cgi/content/abstract/173/2/993) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/173/2/993) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/173/2/993)

Intrinsic Renal Cell Expression of CD40 Directs Th1 Effectors Inducing Experimental Crescentic Glomerulonephritis

J. Am. Soc. Nephrol. (Journal of the American Society of Nephrology) 2003 14 (11) 2813-2822

Abstract (http://www.jasn.org/cgi/content/abstract/14/11/2813) | Full Text (HTML) (http://www.jasn.org/cgi/content/full/14/11/2813) | Full Text (PDF) (http://www.jasn.org/cgi/reprint/14/11/2813)

Inhibition of Interferon (IFN) {gamma}-induced Jak-STAT1 Activation in Microglia by Vasoactive Intestinal Peptide: INHIBITORY EFFECT ON CD40, IFN-INDUCED PROTEIN-10, AND INDUCIBLE NITRIC-OXIDE SYNTHASE EXPRESSION

J Biol Chem (Journal of Biological Chemistry) 2003 278 (30) 27620-27629

Abstract (http://www.jbc.org/cgi/content/abstract/278/30/27620) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/278/30/27620) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/278/30/27620)

CD154-CD40-independent up-regulation of B7-2 on splenic antigen-presenting cells and efficient T cell priming by staphylococcal enterotoxin A

Int Immunol (International Immunology) 2003 15 (7) 817-826

Abstract (http://intimm.oxfordjournals.org/cgi/content/abstract/15/7/817) | Full Text (HTML) (http://intimm.oxfordjournals.org/cgi/content/full/15/7/817) | Full Text (PDF) (http://intimm.oxfordjournals.org/cgi/reprint/15/7/817)

Periductal Area as the Primary Site for T-Cell Activation in Lacrimal Gland Chronic Graft-Versus-Host Disease

IOVS (Investigative Ophthalmology & Visual Science) 2003 44 (5) 1888-1896

Abstract (http://www.iovs.org/cgi/content/abstract/44/5/1888) | Full Text (HTML) (http://www.iovs.org/cgi/content/full/44/5/1888) | Full Text (PDF) (http://www.iovs.org/cgi/reprint/44/5/1888)

A crucial role of CD4 T cells as a functional source of CD154 in the initiation of insulin-dependent diabetes mellitus in the non-obese diabetic mouse

Int Immunol (International Immunology) 2003 15 (3) 351-357

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CD154 Blockade Results in Transient Reduction in Theiler's Murine Encephalomyelitis Virus-Induced Demyelinating Disease

J. Virol. (Journal of Virology) 2003 77 (3) 2247-2250

Abstract (http://jvi.asm.org/cgi/content/abstract/77/3/2247) | Full Text (HTML) (http://jvi.asm.org/cgi/content/full/77/3/2247) | Full Text (PDF) (http://jvi.asm.org/cgi/reprint/77/3/2247)

Broadening of Epitope Recognition During Immune Rejection of ErbB-2-Positive Tumor Prevents Growth of ErbB-2-Negative Tumor

J. Immunol. (The Journal of Immunology) 2003 170 (3) 1202-1208

Abstract (http://www.jimmunol.org/cgi/content/abstract/170/3/1202) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/170/3/1202) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/170/3/1202)

Prevention of Experimental Autoimmune Encephalomyelitis in Common Marmosets Using an Anti-IL-12p40 Monoclonal Antibody

J. Immunol. (The Journal of Immunology) 2002 169 (11) 6554-6563

Abstract (http://www.jimmunol.org/cgi/content/abstract/169/11/6554) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/169/11/6554) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/169/11/6554)

In Vivo Evidence for a Role of Toll-Like Receptor 4 in the Development of Intimal Lesions

Circulation (Circulation) 2002 106 (15) 1985-1990

Abstract (http://circ.ahajournals.org/cgi/content/abstract/106/15/1985) | Full Text (HTML) (http://circ.ahajournals.org/cgi/content/full/106/15/1985) | Full Text (PDF) (http://circ.ahajournals.org/cgi/reprint/106/15/1985)

Suppressor of Cytokine Signaling 1 Inhibits Cytokine Induction of CD40 Expression in Macrophages

J. Immunol. (The Journal of Immunology) 2002 169 (5) 2354-2360

Abstract (http://www.jimmunol.org/cgi/content/abstract/169/5/2354) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/169/5/2354) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/169/5/2354)

THE PATHOGENESIS OF ORAL LICHEN PLANUS

CROBM (Critical Reviews in Oral Biology & Medicine) 2002 13 (4) 350-365

Abstract (http://cro.sagepub.com/cgi/content/abstract/13/4/350) | Full Text (HTML) (http://cro.sagepub.com/cgi/content/full/13/4/350) | Full Text (PDF) (http://cro.sagepub.com/cgi/reprint/13/4/350)

Critical Role of Tumor Necrosis Factor-{alpha} and NF-{kappa}B in Interferon-{gamma}-induced CD40 Expression in Microglia/Macrophages

J Biol Chem (Journal of Biological Chemistry) 2002 277 (16) 13796-13803

Abstract (http://www.jbc.org/cgi/content/abstract/277/16/13796) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/277/16/13796) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/277/16/13796)

Selective Requirement for CD40-CD154 in Drug-Induced Type 1 Versus Type 2 Responses to Trinitrophenyl-Ovalbumin

J. Immunol. (The Journal of Immunology) 2002 168 (8) 3747-3754

Abstract (http://www.jimmunol.org/cgi/content/abstract/168/8/3747) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/168/8/3747) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/168/8/3747)

Spontaneous formation of germinal centers in autoimmune mice

J. Leukoc. Biol. (Journal of Leukocyte Biology) 2001 70 (4) 578-584

Abstract (http://www.jleukbio.org/cgi/content/abstract/70/4/578) | Full Text (HTML) (http://www.jleukbio.org/cgi/content/full/70/4/578) | Full Text (PDF) (http://www.jleukbio.org/cgi/reprint/70/4/578)

Prevention of Experimental Autoimmune Encephalomyelitis in the Common Marmoset (Callithrix jacchus) Using a Chimeric Antagonist Monoclonal Antibody Against Human CD40 Is Associated with Altered B Cell Responses

J. Immunol. (The Journal of Immunology) 2001 167 (5) 2942-2949

Abstract (http://www.jimmunol.org/cgi/content/abstract/167/5/2942) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/167/5/2942) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/167/5/2942)

CD40 Co-Stimulatory Molecule Expression by Dendritic Cells in Primary Atherosclerotic Lesions in Carotid Arteries and in Stenotic Saphenous Vein Coronary Artery Grafts

Vascular (Vascular) 2001 9 (4) 329-333

Abstract (http://vas.sagepub.com/cgi/content/abstract/9/4/329) | Full Text (PDF) (http://vas.sagepub.com/cgi/reprint/9/4/329)

Blockade of CD40 Ligand Suppresses Chronic Experimental Myasthenia Gravis by Down-Regulation of Th1 Differentiation and Up-Regulation of CTLA-4

J. Immunol. (The Journal of Immunology) 2001 166 (11) 6893-6898

Abstract (http://www.jimmunol.org/cgi/content/abstract/166/11/6893) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/166/11/6893) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/166/11/6893)

The Clinical Course of Experimental Autoimmune Encephalomyelitis and Inflammation Is Controlled by the Expression of Cd40 within the Central Nervous System

JEM (Journal of Experimental Medicine) 2001 193 (8) 967-974

Abstract (http://jem.rupress.org/cgi/content/abstract/193/8/967) | Full Text (HTML) (http://jem.rupress.org/cgi/content/full/193/8/967) | Full Text (PDF) (http://jem.rupress.org/cgi/reprint/193/8/967)

Absence of Monocyte Chemoattractant Protein 1 in Mice Leads to Decreased Local Macrophage Recruitment and Antigen-Specific T Helper Cell Type 1 Immune Response in Experimental Autoimmune Encephalomyelitis

JEM (Journal of Experimental Medicine) 2001 193 (6) 713-726

Abstract (http://jem.rupress.org/cgi/content/abstract/193/6/713) | Full Text (HTML) (http://jem.rupress.org/cgi/content/full/193/6/713) | Full Text (PDF) (http://jem.rupress.org/cgi/reprint/193/6/713)

CD40/CD40 Ligand Interactions Are Critical for Elicitation of Autoimmune-Mediated Fibrosis in the Lung

J. Immunol. (The Journal of Immunology) 2001 166 (5) 3556-3563

Abstract (http://www.jimmunol.org/cgi/content/abstract/166/5/3556) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/166/5/3556) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/166/5/3556)

CD4+ and CD8+ T Cell Priming for Contact Hypersensitivity Occurs Independently of CD40-CD154 Interactions

J. Immunol. (The Journal of Immunology) 2001 166 (4) 2323-2332

Abstract (http://www.jimmunol.org/cgi/content/abstract/166/4/2323) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/166/4/2323) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/166/4/2323)

Autoimmune Intervention by CD154 Blockade Prevents T Cell Retention and Effector Function in the Target Organ

J. Immunol. (The Journal of Immunology) 2001 166 (3) 1547-1553

Abstract (http://www.jimmunol.org/cgi/content/abstract/166/3/1547) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/166/3/1547) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/166/3/1547)

Prolonged Islet Graft Survival in NOD Mice by Blockade of the CD40-CD154 Pathway of T-Cell Costimulation

Diabetes (Diabetes) 2001 50 (2) 270-276

Abstract (http://diabetes.diabetesjournals.org/cgi/content/abstract/50/2/270) | Full Text (HTML) (http://diabetes.diabetesjournals.org/cgi/content/full/50/2/270)

CD40 Ligand--an important target for immunotherapy?

Lupus (Lupus) 2001 10 (1) 1-3

Full Text (PDF) (http://lup.sagepub.com/cgi/reprint/10/1/1)

Long-term anti-CD154 dosing in nephritic mice is required to maintain survival and inhibit mediators of renal fibrosis

Lupus (Lupus) 2001 10 (1) 9-22

Abstract (http://lup.sagepub.com/cgi/content/abstract/10/1/9) | Full Text (PDF) (http://lup.sagepub.com/cgi/reprint/10/1/9)

Increased T Cell Autoreactivity in the Absence of CD40-CD40 Ligand Interactions: A Role of CD40 in Regulatory T Cell Development

J. Immunol. (The Journal of Immunology) 2001 166 (1) 353-360

Abstract (http://www.jimmunol.org/cgi/content/abstract/166/1/353) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/166/1/353) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/166/1/353)

The New Pathology of Multiple Sclerosis

Mult Scler (Multiple Sclerosis) 2000 6 (6) 409-410

Full Text (PDF) (http://msj.sagepub.com/cgi/reprint/6/6/409)

Amelioration of Experimental Autoimmune Uveoretinitis by Pretreatment with a Pathogenic Peptide in Liposome and Anti-CD40 Ligand Monoclonal Antibody

J. Immunol. (The Journal of Immunology) 2000 165 (6) 2962-2969

Abstract (http://www.jimmunol.org/cgi/content/abstract/165/6/2962) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/165/6/2962) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/165/6/2962)

Involvement of STAT-1 and Ets Family Members in Interferon-{gamma} Induction of CD40 Transcription in Microglia/Macrophages

J Biol Chem (Journal of Biological Chemistry) 2000 275 (31) 23674-23684

Abstract (http://www.jbc.org/cgi/content/abstract/275/31/23674) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/275/31/23674) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/275/31/23674)

IFN-{beta}-1b Inhibits IL-12 Production in Peripheral Blood Mononuclear Cells in an IL-10-Dependent Mechanism: Relevance to IFN-{beta}-1b Therapeutic Effects in Multiple Sclerosis
J. Immunol. (The Journal of Immunology) 2000 165 (1) 548-557
Abstract (http://www.jimmunol.org/cgi/content/abstract/165/1/548) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/165/1/548) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/165/1/548)

Both early and delayed anti-CD40L antibody treatment induces a stable plaque phenotype
Proc. Natl. Acad. Sci. USA (PNAS) 2000 97 (13) 7464-7469
Abstract (/cgi/content/abstract/97/13/7464) | Full Text (HTML) (/cgi/content/full/97/13/7464) | Full Text (PDF) (/cgi/reprint/97/13/7464)

Prevention of Experimental Colitis in SCID Mice Reconstituted with CD45RBhigh CD4+ T Cells by Blocking the CD40-CD154 Interactions
J. Immunol. (The Journal of Immunology) 2000 164 (11) 6005-6014
Abstract (http://www.jimmunol.org/cgi/content/abstract/164/11/6005) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/164/11/6005) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/164/11/6005)

The Roles of CD28 and CD40 Ligand in T Cell Activation and Tolerance
J. Immunol. (The Journal of Immunology) 2000 164 (9) 4465-4470
Abstract (http://www.jimmunol.org/cgi/content/abstract/164/9/4465) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/164/9/4465) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/164/9/4465)

Visualization of Myelin Basic Protein (Mbp) T Cell Epitopes in Multiple Sclerosis Lesions Using a Monoclonal Antibody Specific for the Human Histocompatibility Leukocyte Antigen (Hla)-Dr2-Mbp 85-99 Complex
JEM (Journal of Experimental Medicine) 2000 191 (8) 1395-1412
Abstract (http://jem.rupress.org/cgi/content/abstract/191/8/1395) | Full Text (HTML) (http://jem.rupress.org/cgi/content/full/191/8/1395) | Full Text (PDF) (http://jem.rupress.org/cgi/reprint/191/8/1395)

Presentation of {alpha}B-Crystallin to T Cells in Active Multiple Sclerosis Lesions: An Early Event Following Inflammatory Demyelination
J. Immunol. (The Journal of Immunology) 2000 164 (8) 4359-4366
Abstract (http://www.jimmunol.org/cgi/content/abstract/164/8/4359) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/164/8/4359) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/164/8/4359)

Systemic upregulation of CD40 and CD40 ligand mRNA expression in multiple sclerosis
Mult Scler (Multiple Sclerosis) 2000 6 (2) 61-65
Abstract (http://msj.sagepub.com/cgi/content/abstract/6/2/61) | Full Text (PDF) (http://msj.sagepub.com/cgi/reprint/6/2/61)

The CD40/CD40 Ligand Interaction Is Required for Resistance to Toxoplasmic Encephalitis
Infect. Immun. (Infection and Immunity) 2000 68 (3) 1312-1318
Abstract (http://iai.asm.org/cgi/content/abstract/68/3/1312) | Full Text (HTML) (http://iai.asm.org/cgi/content/full/68/3/1312) | Full Text (PDF) (http://iai.asm.org/cgi/reprint/68/3/1312)

Functional Maturation of Adult Mouse Resting Microglia into an APC Is Promoted by Granulocyte-Macrophage Colony-Stimulating Factor and Interaction with Th1 Cells
J. Immunol. (The Journal of Immunology) 2000 164 (4) 1705-1712
Abstract (http://www.jimmunol.org/cgi/content/abstract/164/4/1705) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/164/4/1705) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/164/4/1705)

Acquired, but Not Innate, Immune Responses to Streptococcus pneumoniae Are Compromised by Neutralization of CD40L
Infect. Immun. (Infection and Immunity) 2000 68 (2) 511-517
Abstract (http://iai.asm.org/cgi/content/abstract/68/2/511) | Full Text (HTML) (http://iai.asm.org/cgi/content/full/68/2/511) | Full Text (PDF) (http://iai.asm.org/cgi/reprint/68/2/511)

Resting B Lymphocytes as APC for Naive T Lymphocytes: Dependence on CD40 Ligand/CD40
J. Immunol. (The Journal of Immunology) 2000 164 (2) 688-697
Abstract (http://www.jimmunol.org/cgi/content/abstract/164/2/688) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/164/2/688) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/164/2/688)

Pararosaniline Fixation for Detection of Co-stimulatory Molecules, Cytokines, and Specific Antibody
J Histochem Cytochem (Journal of Histochemistry & Cytochemistry) 2000 48 (1) 95-103

Abstract (http://jhc.sagepub.com/cgi/content/abstract/48/1/95) | Full Text (HTML) (http://jhc.sagepub.com/cgi/content/full/48/1/95) | Full Text (PDF) (http://jhc.sagepub.com/cgi/reprint/48/1/95)

CD4+ T Cell Responses to CD40-Deficient APCs: Defects in Proliferation and Negative Selection Apply Only with B Cells as APCs

J. Immunol. (The Journal of Immunology) 1999 163 (10) 5250-5256

Abstract (http://www.jimmunol.org/cgi/content/abstract/163/10/5250) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/163/10/5250) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/163/10/5250)

Hyperexpression of CD40 Ligand (CD154) in Inflammatory Bowel Disease and Its Contribution to Pathogenic Cytokine Production

J. Immunol. (The Journal of Immunology) 1999 163 (7) 4049-4057

Abstract (http://www.jimmunol.org/cgi/content/abstract/163/7/4049) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/163/7/4049) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/163/7/4049)

Long-term survival and function of intrahepatic islet allografts in rhesus monkeys treated with humanized anti-CD154

Proc. Natl. Acad. Sci. USA (PNAS) 1999 96 (14) 8132-8137

Abstract (/cgi/content/abstract/96/14/8132) | Full Text (HTML) (/cgi/content/full/96/14/8132) | Full Text (PDF) (/cgi/reprint/96/14/8132)

CCR5+ and CXCR3+ T cells are increased in multiple sclerosis and their ligands MIP-1{alpha} and IP-10 are expressed in demyelinating brain lesions

Proc. Natl. Acad. Sci. USA (PNAS) 1999 96 (12) 6873-6878

Abstract (/cgi/content/abstract/96/12/6873) | Full Text (HTML) (/cgi/content/full/96/12/6873) | Full Text (PDF) (/cgi/reprint/96/12/6873)

Mechanisms of IL-10 Production in Human Microglia-T Cell Interaction

J. Immunol. (The Journal of Immunology) 1999 162 (11) 6819-6828

Abstract (http://www.jimmunol.org/cgi/content/abstract/162/11/6819) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/162/11/6819) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/162/11/6819)

Expression of mitogen activated protein kinases in labial salivary glands of patients with Sjogren's syndrome

Ann Rheum Dis (Annals of the Rheumatic Diseases) 1999 58 (6) 382-385

Abstract (http://ard.bmjjournals.com/cgi/content/abstract/58/6/382) | Full Text (HTML) (http://ard.bmjjournals.com/cgi/content/full/58/6/382) | Full Text (PDF) (http://ard.bmjjournals.com/cgi/reprint/58/6/382)

CD28 Costimulation Is Crucial for the Development of Spontaneous Autoimmune Encephalomyelitis

J. Immunol. (The Journal of Immunology) 1999 162 (8) 4490-4495

Abstract (http://www.jimmunol.org/cgi/content/abstract/162/8/4490) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/162/8/4490) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/162/8/4490)

Regulation of Interleukin (IL)-12 Receptor {beta}2 Subunit Expression by Endogenous IL-12: A Critical Step in the Differentiation of Pathogenic Autoreactive T Cells

JEM (Journal of Experimental Medicine) 1999 189 (6) 969-978

Abstract (http://jem.rupress.org/cgi/content/abstract/189/6/969) | Full Text (HTML) (http://jem.rupress.org/cgi/content/full/189/6/969) | Full Text (PDF) (http://jem.rupress.org/cgi/reprint/189/6/969)

CD40 Signaling of Monocyte Inflammatory Cytokine Synthesis through an ERK1/2-dependent Pathway: A TARGET OF INTERLEUKIN (IL)-4 AND IL-10 ANTI-INFLAMMATORY ACTION

J Biol Chem (Journal of Biological Chemistry) 1999 274 (9) 5835-5842

Abstract (http://www.jbc.org/cgi/content/abstract/274/9/5835) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/274/9/5835) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/274/9/5835)

CD40 Activation Boosts T Cell Immunity In Vivo by Enhancing T Cell Clonal Expansion and Delaying Peripheral T Cell Deletion

J. Immunol. (The Journal of Immunology) 1999 162 (4) 2024-2034

Abstract (http://www.jimmunol.org/cgi/content/abstract/162/4/2024) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/162/4/2024) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/162/4/2024)

CD40-CD154 Interaction and IFN-{gamma} Are Required for IL-12 But Not Prostaglandin E2 Secretion by Microglia During Antigen Presentation to Th1 Cells

J. Immunol. (The Journal of Immunology) 1999 162 (3) 1384-1391

Abstract (http://www.jimmunol.org/cgi/content/abstract/162/3/1384) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/162/3/1384) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/162/3/1384)

Induction of Immunologic Tolerance for Transplantation

Physiol. Rev. (Physiological Reviews) 1999 79 (1) 99-141

Abstract (http://physrev.physiology.org/cgi/content/abstract/79/1/99) | Full Text (HTML) (http://physrev.physiology.org/cgi/content/full/79/1/99) | Full Text (PDF) (http://physrev.physiology.org/cgi/reprint/79/1/99)

Immune Invasion of the Central Nervous System Parenchyma and Experimental Allergic Encephalomyelitis, But Not Leukocyte Extravasation from Blood, Are Prevented in Macrophage-Depleted Mice

J. Immunol. (The Journal of Immunology) 1998 161 (7) 3767-3775

Abstract (http://www.jimmunol.org/cgi/content/abstract/161/7/3767) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/161/7/3767) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/161/7/3767)

Antitumor Effect of CD40 Ligand: Elicitation of Local and Systemic Antitumor Responses by IL-12 and B7

J. Immunol. (The Journal of Immunology) 1998 161 (4) 1901-1907

Abstract (http://www.jimmunol.org/cgi/content/abstract/161/4/1901) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/161/4/1901) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/161/4/1901)

Kinetics of Expression of Costimulatory Molecules and Their Ligands in Murine Relapsing Experimental Autoimmune Encephalomyelitis In Vivo

J. Immunol. (The Journal of Immunology) 1998 161 (3) 1104-1112

Abstract (http://www.jimmunol.org/cgi/content/abstract/161/3/1104) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/161/3/1104) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/161/3/1104)

Anti-CD40L Accelerates Renal Disease and Adenopathy in MRL-lpr Mice in Parallel with Decreased Thymocyte Apoptosis

J. Immunol. (The Journal of Immunology) 1998 161 (2) 729-739

Abstract (http://www.jimmunol.org/cgi/content/abstract/161/2/729) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/161/2/729) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/161/2/729)

Therapy with antibodies against CD40L (CD154) and CD44-variant isoforms reduces experimental autoimmune encephalomyelitis induced by a proteolipid protein peptide

Mult Scler (Multiple Sclerosis) 1998 4 (3) 147-153

Abstract (http://msj.sagepub.com/cgi/content/abstract/4/3/147) | Full Text (PDF) (http://msj.sagepub.com/cgi/reprint/4/3/147)

Microglia Are More Efficient Than Astrocytes in Antigen Processing and in Th1 But Not Th2 Cell Activation

J. Immunol. (The Journal of Immunology) 1998 160 (10) 4671-4680

Abstract (http://www.jimmunol.org/cgi/content/abstract/160/10/4671) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/160/10/4671) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/160/10/4671)

CD40 ligand (CD154) stimulation of macrophages to produce HIV-1-suppressive {beta} -chemokines

Proc. Natl. Acad. Sci. USA (PNAS) 1998 95 (9) 5205-5210

Abstract (/cgi/content/abstract/95/9/5205) | Full Text (HTML) (/cgi/content/full/95/9/5205) | Full Text (PDF) (/cgi/reprint/95/9/5205)

CD40 Ligand Is Not Essential for Induction of Type 1 Cytokine Responses or Protective Immunity after Primary or Secondary Infection With Histoplasma capsulatum

JEM (Journal of Experimental Medicine) 1998 187 (8) 1315-1324

Abstract (http://jem.rupress.org/cgi/content/abstract/187/8/1315) | Full Text (HTML) (http://jem.rupress.org/cgi/content/full/187/8/1315) | Full Text (PDF) (http://jem.rupress.org/cgi/reprint/187/8/1315)

Anti-CD40 Ligand Antibody Treatment of SNF1 Mice with Established Nephritis: Preservation of Kidney Function

J. Immunol. (The Journal of Immunology) 1998 160 (5) 2158-2165

Abstract (http://www.jimmunol.org/cgi/content/abstract/160/5/2158) | Full Text (HTML) (http://www.jimmunol.org/cgi/content/full/160/5/2158) | Full Text (PDF) (http://www.jimmunol.org/cgi/reprint/160/5/2158)

Increased interleukin 12 production in progressive multiple sclerosis: Induction by activated CD4+ T cells via CD40 ligand

Proc. Natl. Acad. Sci. USA (PNAS) 1997 94 (2) 599-603

Abstract (/cgi/content/abstract/94/2/599) | Full Text (HTML) (/cgi/content/full/94/2/599) | Full Text (PDF) (/cgi/reprint/94/2/599)

Requirement for CD40 Ligand in Costimulation Induction, T Cell Activation, and Experimental Allergic Encephalomyelitis

Science (Science) 1996 273 (5283) 1864-1867

Abstract (http://www.sciencemag.org/cgi/content/abstract/273/5283/1864) | Full Text (HTML) (http://www.sciencemag.org/cgi/content/full/273/5283/1864)

Involvement of STAT-1 and Ets Family Members in Interferon-{gamma} Induction of CD40 Transcription in Microglia/Macrophages

J Biol Chem (Journal of Biological Chemistry) 2000 275 (31) 23674-23684

Abstract (http://www.jbc.org/cgi/content/abstract/275/31/23674) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/275/31/23674) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/275/31/23674)

Ligation of CD40 Stimulates the Induction of Nitric-oxide Synthase in Microglial Cells

J Biol Chem (Journal of Biological Chemistry) 2001 276 (48) 44527-44533

Abstract (http://www.jbc.org/cgi/content/abstract/276/48/44527) | Full Text (HTML) (http://www.jbc.org/cgi/content/full/276/48/44527) | Full Text (PDF) (http://www.jbc.org/cgi/reprint/276/48/44527)