

Publications List on Stem Cells and the Control of Inflammation

General reviews

- Mesenchymal stromal cells: sensors and switchers of inflammation. Bernardo ME, Fibbe WE. *Cell Stem Cell*. 2013 Oct 3;13(4): 392-402.
- Mesenchymal stem cells as therapeutic agents of inflammatory and autoimmune diseases. DelaRosa O, Dalemans W, Lombardo E. *Curr Opin Biotechnol*. 2012 Dec; 23(6): 978-83.
- Toll-like receptors as modulators of mesenchymal stem cells. Delarosa O, Dalemans W, Lombardo E. *Front Immunol*. 2012 Jul 2; 3: 182. Open Access
- Minimal criteria for defining multipotent mesenchymal stromal cells. The International Society for Cellular Therapy position statement. Dominici M, Le Blanc K, Mueller I, Slaper-Cortenbach I, Marini F, Krause D, Deans R, Keating A, Prockop Dj, Horwitz E. *Cytotherapy*. 2006; 8(4): 315-7
- Therapeutic applications of mesenchymal stromal cells: paracrine effects and potential improvements. Doorn J, Moll G, Le Blanc K, van Blitterswijk C, de Boer J. *Tissue Eng Part B Rev*. 2012 Apr; 18(2): 101-15.
- Anti-donor immune responses elicited by allogeneic mesenchymal stem cells: what have we learned so far? Griffin MD, Ryan AE, Alagesan S, Lohan P, Treacy O, Ritter T. *Immunol Cell Biol*. 2013 Jan; 91(1): 40-51.
- Multipotent mesenchymal stromal cells and the innate immune system. Le Blanc K, Mougiakakos D. *Nat Rev Immunol*. 2012 Apr 25; 12(5): 383-96.
- Indoleamine 2,3 dioxygenase and metabolic control of immune responses. Munn DH, Mellor AL. *Trends Immunol*. 2013 Mar; 34(3): 137-43.
- Defining the risks of mesenchymal stromal cell therapy. Prockop DJ, Brenner M, Fibbe WE, Horwitz E, Le Blanc K, Phinney DG, Simmons PJ, Sensebe L, Keating A. *Cytotherapy*. 2010 Sep; 12(5): 576-8.
- Mesenchymal stem cells: mechanisms of inflammation. Singer NG, Caplan AI. *Annu Rev Pathol*. 2011; 6: 457-78.

In vitro studies and mechanism of action (1)

- Requirement of IFN-gamma-mediated indoleamine 2,3-dioxygenase expression in the modulation of lymphocyte proliferation by human adipose-derived stem cells. DelaRosa O, Lombardo E, Beraza A, Mancheño-Corvo P, Ramirez C, Menta R, Rico L, Camarillo E, García L, Abad JL, Trigueros C, Delgado M, Büscher D. *Tissue Eng Part A*. 2009 Oct;15(10): 2795-806.
- Human adipose-derived stem cells impair natural killer cell function and exhibit low susceptibility to natural killer-mediated lysis. DelaRosa O, Sánchez-Correa B, Morgado S, Ramírez C, del Río B, Menta R, Lombardo E, Tarazona R, Casado JG. *Stem Cells Dev*. 2012 May 20; 21(8): 1333-43.
- Tryptophan-derived catabolites are responsible for inhibition of T and natural killer cell proliferation induced by indoleamine 2,3-dioxygenase. Frumento G, Rotondo R, Tonetti M, Damonte G, Benatti U, Ferrara GB. *J Exp Med*. 2002 Aug 19; 196(4): 459-68 Open Access
- Role for interferon-gamma in the immunomodulatory activity of human bone marrow mesenchymal stem cells. Krampera M, Cosmi L, Angeli R, Pasini A, Liotta F, Andreini A, Santarlasci V, Mazzinghi B, Pizzolo G, Vinante F, Romagnani P, Maggi E, Romagnani S, Annunziato F. *Stem Cells*. 2006 Feb; 24(2): 386-98. Open Access
- HLA expression and immunologic properties of differentiated and undifferentiated mesenchymal stem cells. Le Blanc, K., Tammik, C., Rosendahl, K., Zetterberg, E., and Ringdén, O. *Exp Hematol*. 2003 Oct; 31(10): 890-6.
- Toll-like receptor-mediated signaling in human adipose-derived stem cells: implications for immunogenicity and immunosuppressive potential. Lombardo E, DelaRosa O, Mancheño-Corvo P, Menta R, Ramirez C, Büscher D. *Tissue Eng Part A*. 2009 Jul; 15(7): 1579-89.

In vitro studies and mechanism of action (2)

- Interaction of human mesenchymal stem cells with cells involved in alloantigen-specific immune response favors the differentiation of CD4+ T-cell subsets expressing a regulatory/suppressive phenotype. Maccario R, Podestà M, Moretta A, Cometa A, Comoli P, Montagna D, Daudt L, Ibatici A, Piaggio G, Pozzi S, Frassoni F, Locatelli F. *Haematologica*. 2005 Apr; 90(4): 516-25. Open Access
- Adipose mesenchymal stromal cell function is not affected by methotrexate and azathioprine. Mancheño-Corvo P, Franquesa M, de la Rosa O, Ramírez C, García-Benzaquén L, Fernández V, Menta R, Beraza A, Dalemans W, Hoogduijn MJ, Lombardo E. *Biores Open Access*. 2013 Dec 1; 2(6): 431-9. Open Access
- Human bone marrow stromal cells inhibit allogeneic T-cell responses by indoleamine 2,3-dioxygenase-mediated tryptophan degradation. Meisel R, Zibert A, Laryea M, Göbel U, Däubener W, Dilloo D. *Blood*. 2004 Jun 15; 103(12): 4619-21. Open Access
- Interferon-gamma does not break, but promotes the immunosuppressive capacity of adult human mesenchymal stem cells. Ryan JM, Barry F, Murphy JM, Mahon BP. *Clin Exp Immunol*. 2007 Aug; 149(2): 353-63. Open Access
- APRIL and BAFF proteins increase proliferation of human adipose-derived stem cells through activation of Erk1/2 MAP kinase. Zonca M, Mancheño-Corvo P, DelaRosa O, Mañes S, Büscher D, Lombardo E, Planelles L. *Tissue Eng Part A*. 2012 Apr; 18(7-8): 852-9.
- Human adipose tissue is a source of multipotent stem cells. Zuk PA, Zhu M, Ashjian P, De Ugarte DA, Huang JI, Mizuno H, Alfonso ZC, Fraser JK, Benhaim P, Hedrick MH. *Mol Biol Cell*. 2002 Dec; 13(12): 4279-95 Open Access

Clinical studies

- Multiple infusions of mesenchymal stromal cells induce sustained remission in children with steroid-refractory, grade III-IV acute graft-versus-host disease. Ball LM, Bernardo ME, Roelofs H, van Tol MJ, Contoli B, Zwaginga JJ, Avanzini MA, Conforti A, Bertaina A, Giorgiani G, Jol-van der Zijde CM, Zecca M, Le Blanc K, Frassoni F, Egeler RM, Fibbe WE, Lankester AC, Locatelli F. *Br J Haematol.* 2013 Nov; 163(4): 501-9.
- Autologous bone marrow-derived mesenchymal stromal cells in the treatment of fistulising Crohn's disease. Ciccocioppo R, Bernardo ME, Sgarella A, Maccario R, Avanzini MA, Ubezio C, Minelli A, Alvisi C, Vanoli A, Calliada F, Dionigi P, Perotti C, Locatelli F, Corazza GR. *Gut.* 2011 Jun; 60(6): 788-98.
- Expanded allogeneic adipose-derived stem cells (eASCs) for the treatment of complex perianal fistula in Crohn's disease: results from a multicenter phase I/IIa clinical trial. de la Portilla F, Alba F, García-Olmo D, Herrerías JM, González FX, Galindo A. *Int J Colorectal Dis.* 2013 Mar; 28(3): 313-23.
- A phase I clinical trial of the treatment of Crohn's fistula by adipose mesenchymal stem cell transplantation. García-Olmo D, García-Arranz M, Herreros D, Pascual I, Peiro C, Rodríguez-Montes JA. *Dis Colon Rectum.* 2005 Jul; 48(7): 1416-23
- Expanded adipose-derived stem cells for the treatment of complex perianal fistula: a phase II clinical trial. Garcia-Olmo D, Herreros D, Pascual I, Pascual JA, Del-Valle E, Zorrilla J, De-La-Quintana P, Garcia-Arranz M, Pascual M. *Dis Colon Rectum.* 2009 Jan; 52(1): 79-86.
- Adipose-derived stem cells in Crohn's rectovaginal fistula. García-Olmo D, Herreros D, De-La-Quintana P, Guadalajara H, Trébol J, Georgiev-Hristov T, García-Arranz M. *Case Rep Med.* 2010; 2010: 961758. Open Access
- A randomized, double-blind, placebo-controlled, dose-escalation study of intravenous adult human mesenchymal stem cells (prochymal) after acute myocardial infarction. Hare JM, Traverse JH, Henry TD, Dib N, Strumpf RK, Schulman SP, Gerstenblith G, DeMaria AN, Denktas AE, Gammon RS, Hermiller JB Jr, Reisman MA, Schaer GL, Sherman W. *J Am CollCardiol.* 2009 Dec 8; 54(24): 2277-86.
- Autologous expanded adipose-derived stem cells for the treatment of complex cryptoglandular perianal fistulas: a phase III randomized clinical trial (FATT 1: fistula Advanced Therapy Trial 1) and long-term evaluation. Herreros MD, Garcia-Arranz M, Guadalajara H, De-La-Quintana P, Garcia-Olmo D; FATT Collaborative Group. *Dis Colon Rectum.* 2012 Jul; 55(7): 762-72.

Preclinical experimental models: arthritis

- Cell therapy using allogeneic bone marrow mesenchymal stem cells prevents tissue damage in collagen-induced arthritis. Augello A, Tasso R, Negrini SM, Cancedda R, Pennesi G. *Arthritis Rheum.* 2007 Apr; 56(4): 1175-86 Open Access
- IL-6-dependent PGE2 secretion by mesenchymal stem cells inhibits local inflammation in experimental arthritis. Bouffi C, Bony C, Courties G, Jorgensen C, Noël D. *PLoS One.* 2010 Dec 7; 5(12): e14247. Open Access.
- Treatment of experimental arthritis by inducing immune tolerance with human adipose-derived mesenchymal stem cells. González MA, Gonzalez-Rey E, Rico L, Büscher D, Delgado M. *Arthritis Rheum.* 2009 Apr; 60(4): 1006-19. Open Access
- Human adipose-derived mesenchymal stem cells reduce inflammatory and T cell responses and induce regulatory T cells in vitro in rheumatoid arthritis. Gonzalez-Rey E, Gonzalez MA, Varela N, O'Valle F, Hernandez-Cortes P, Rico L, Büscher D, Delgado M. *Ann Rheum Dis.* 2010 Jan; 69(1): 241-8.
- Mesenchymal stem cells are conditionally therapeutic in preclinical models of rheumatoid arthritis. Papadopoulou A, Yiangou M, Athanasiou E, Zogas N, Kaloyannidis P, Batsis I, Fassas A, Anagnostopoulos A, Yannaki E. *Ann Rheum Dis.* 2012 Oct; 71(10): 1733-40.
- Administering human adipose-derived mesenchymal stem cells to prevent and treat experimental arthritis. Zhou B, Yuan J, Zhou Y, Ghawji M Jr, Deng YP, Lee AJ, Lee AJ, Nair U, Kang AH, Brand DD, Yoo TJ. *Clin Immunol.* 2011 Dec; 141(3): 328-37.

Preclinical experimental models: colitis

- Adipose-derived mesenchymal stromal cells induce immunomodulatory macrophages which protect from experimental colitis and sepsis. Anderson P, Souza-Moreira L, Morell M, Caro M, O'Valle F, Gonzalez-Rey E, Delgado M. Gut. 2013 Aug; 62(8): 1131-41.
- Intraperitoneal but not intravenous cryopreserved mesenchymal stromal cells home to the inflamed colon and ameliorate experimental colitis. Castelo-Branco MT, Soares ID, Lopes DV, Buongusto F, Martinusso CA, do Rosario A Jr, Souza SA, Gutfilen B, Fonseca LM, Elia C, Madi K, Schanaider A, Rossi MI, Souza HS. PLoS One. 2012; 7(3): e33360. Open Access
- Adipose-derived mesenchymal stem cells alleviate experimental colitis by inhibiting inflammatory and autoimmune responses. González MA, Gonzalez-Rey E, Rico L, Büscher D, Delgado M. Gastroenterology. 2009 Mar; 136(3): 978-89.
- Human adult stem cells derived from adipose tissue protect against experimental colitis and sepsis. Gonzalez-Rey E, Anderson P, González MA, Rico L, Büscher D, Delgado M. Gut. 2009 Jul; 58(7): 929-39.

Preclinical experimental models: sepsis

- Adipose-derived mesenchymal stromal cells induce immunomodulatory macrophages which protect from experimental colitis and sepsis. Anderson P, Souza-Moreira L, Morell M, Caro M, O'Valle F, Gonzalez-Rey E, Delgado M. *Gut*. 2013 Aug; 62(8): 1131-41.
- Human adult stem cells derived from adipose tissue protect against experimental colitis and sepsis. Gonzalez-Rey E, Anderson P, González MA, Rico L, Büscher D, Delgado M. *Gut*. 2009 Jul; 58(7): 929-39.
- Antibacterial effect of human mesenchymal stem cells is mediated in part from secretion of the antimicrobial peptide LL-37. Krasnodembskaya A, Song Y, Fang X, Gupta N, Serikov V, Lee JW, Matthay MA. *Stem Cells*. 2010 Dec; 28(12): 2229-38. Open Access
- Human mesenchymal stem cells reduce mortality and bacteremia in gram-negative sepsis in mice in part by enhancing the phagocytic activity of blood monocytes. Krasnodembskaya A, Samarani G, Song Y, Zhuo H, Su X, Lee JW, Gupta N, Petrini M, Matthay MA. *Am J Physiol Lung Cell Mol Physiol*. 2012 May 15; 302(10): L1003-13. Open Access
- Bone marrow stromal cells attenuate sepsis via prostaglandin E(2)-dependent reprogramming of host macrophages to increase their interleukin-10 production. Németh K, Leelahavanichkul A, Yuen PS, Mayer B, Parmelee A, Doi K, Robey PG, Leelahavanichkul K, Koller BH, Brown JM, Hu X, Jelinek I, Star RA, Mezey E. *Nat Med*. 2009 Jan; 15(1): 42-9. Open Access