

Bibliography

The Regenokine® Program involves a customization of treatment elements targeted to the patient and their orthopedic disease or pain condition. The Program is characterized by a variety of diagnostic and therapeutic methods, state-of-the-art pain management and lifestyle measures to address pain from various angles. Injection therapy with autologous conditioned serum (ACS) is an important element within the Regenokine® Program, although it is only one of the elements of the Program.

Below, we provide an outline of 5 randomized, controlled trials focusing exclusively on the impact of injections with autologous conditioned serum (ACS). We also provide below a more comprehensive bibliography, based on a search of published medical literature.

Outline of 5 randomized, controlled trials focusing exclusively on the impact of injections with autologous conditioned serum (ACS)

Shoulder pain in supraspinatus tendinopathy - Damjanov et al, 2018:

Damjanov et al.¹ evaluated the efficacy and safety of autologous serum injections into the supraspinatus tendon in comparison to corticosteroid injections, standard of care, in 32 patients with symptomatic supraspinatus tendinopathy. Autologous serum therapy reduced shoulder pain and improved joint function significantly more effectively after 4 weeks of treatment over corticosteroid. These improvements were sustained to week 24, the end of the study. No adverse events AEs were observed in the autologous serum group.

Quality of the study: Randomized, mono-center, prospective, standard of care-controlled, double-blinded

Link to study: <https://pubmed.ncbi.nlm.nih.gov/30167587/>

Title: "The efficacy and safety of autologous conditioned serum (ACS) injections compared with betamethasone and placebo injections in the treatment of chronic shoulder joint pain due to supraspinatus tendinopathy: a prospective, randomized, double-blind, controlled study"

¹ Damjanov N et al.: The efficacy and safety of autologous conditioned serum (ACS) injections compared with betamethasone and placebo injections in the treatment of chronic shoulder joint pain due to supraspinatus tendinopathy: a prospective, randomized, double-blind, controlled study. Med Ultrason (2018), 1-7, DOI: 10.11152/mu-1495

Knee osteoarthritis – Pishgahi et al, 2020:

Pishgahi et al² evaluated the efficacy and safety of intra-articular injections with autologous serum in comparison to dextrose prolotherapy and autologous PRP (platelet rich plasma) in 92 knee osteoarthritis patients. Both autologous serum and PRP treated patients showed improvement in pain and function at 1 and 6 months, however, this progress was more significant in the autologous serum group especially at 6 months. Dextrose prolotherapy showed no substantial changes. The authors did not mention side-effects in their publication.

Quality of the study: Randomized, mono-center, prospective, comparator-controlled

Link to study: <https://pubmed.ncbi.nlm.nih.gov/32615658/>

Title: “Effect of Dextrose Prolotherapy, Platelet Rich Plasma and Autologous Conditioned Serum on Knee Osteoarthritis: A Randomized Clinical Trial”

Knee osteoarthritis - Baltzer et al, 2008:

Baltzer et al.³ evaluated the efficacy and safety of intra-articular injections with autologous serum in comparison to hyaluronic acid (HA) and placebo (saline) in 376 patients suffering from knee osteoarthritis. The autologous serum group showed a significantly higher pain reduction at weeks 7, 13, and 26 were significantly lower compared to HA and placebo. Similarly, function and stiffness of the joint improved significantly over HA and placebo. The frequency of observed transient knee-related AEs (pain, heat sensation, swelling) was comparable in the autologous serum and placebo group, but higher in the HA group. Overall, no serious adverse events were observed.

Quality of the study: Randomized, multi-center, prospective, placebo-controlled, double-blinded.

Link to study: <https://pubmed.ncbi.nlm.nih.gov/18674932/>

Title: “Autologous conditioned serum (Orthokine) is an effective treatment for knee osteoarthritis”

² Pishgahi A, Abolhasan R, Shakouri SK, Soltani-Zangbar MS, Dareshiri S, Ranjbar Kiyakalayeh S, Khoeilar A, Zamani M, Motavalli Khiavi F, Pourabbas Kheiraddin B, Mehdizadeh A, Yousefi M. Effect of Dextrose Prolotherapy, Platelet Rich Plasma and Autologous Conditioned Serum on Knee Osteoarthritis: A Randomized Clinical Trial. Iran J Allergy Asthma Immunol. 2020 Jun 23;19(3):243-252. doi: 10.18502/ijaai.v19i3.3452. PMID: 32615658.

³ Baltzer AW, Moser C, Jansen SA, Krauspe R. Autologous conditioned serum (Orthokine) is an effective treatment for knee osteoarthritis. Osteoarthritis Cartilage. 2009 Feb;17(2):152-60. doi: 10.1016/j.joca.2008.06.014. Epub 2008 Jul 31. PMID: 18674932

Knee osteoarthritis – Auw Yang et al, 2007:

Yang et al.⁴ evaluated the efficacy and safety of intra-articular injections with autologous serum in comparison to placebo (saline) in 182 patients suffering from knee osteoarthritis. Both groups showed a significant improvement on all outcome measures, as compared to baseline values. Autologous serum demonstrated superiority over placebo in the categories “symptom” and “sport”, measured with a certain questionnaire “KOOS”. Autologous serum consistently performed better (non-statistically significant) than placebo on the other endpoints. The authors observed adverse events with a similar frequency in both groups. Two serious adverse events were observed in the autologous serum group: one being a severe inflammatory reaction and the other one being a procedure-related joint infection -not attributed to the serum itself.

Quality of the study: Randomized, multi-center, prospective, placebo-controlled, double-blinded

Link to study: <https://pubmed.ncbi.nlm.nih.gov/17825587/>

Title: “Autologous interleukin-1 receptor antagonist improves function and symptoms in osteoarthritis when compared to placebo in a prospective randomized controlled trial”

Sciatica in spine disease - Becker et al, 2007:

Becker et al.⁵ evaluated the efficacy and safety of autologous serum injections to the nerve root in comparison to two different doses of corticosteroid injections in 84 patients with symptomatic radicular compression of the lumbar spine. From week 12 to the final evaluation at Week 22, autologous serum injections were consistently superior over corticosteroids in regard to pain reduction reaching significant superiority over the lower corticosteroid dose at 22 weeks. The authors observed identical frequencies of adverse events in all three groups. Three serious adverse events were observed of which all were severe headaches, one per group. These were evaluated as procedure related and not attributed to the injected substances.

⁴ Auw Yang KG, Raijmakers NJ, van Arkel ER, Caron JJ, Rijk PC, Willems WJ, Zijl JA, Verbout AJ, Dhert WJ, Saris DB. Autologous interleukin-1 receptor antagonist improves function and symptoms in osteoarthritis when compared to placebo in a prospective randomized controlled trial. *Osteoarthritis Cartilage*. 2008 Apr;16(4):498-505. Epub 2007 Sep 6. PubMed PMID: 17825587

⁵ Becker C, Heidersdorf S, Drewlo S, de Rodriguez SZ, Krämer J, Willburger RE. Efficacy of epidural perineural injections with autologous conditioned serum for lumbar radicular compression: an investigator-initiated, prospective, double-blind, reference-controlled study. *Spine (Phila Pa 1976)*. 2007 Aug 1;32(17):1803-8. doi: 10.1097/BRS.0b013e3181076514. Erratum in: *Spine*. 2007 Nov 15;32(24):table of contents. Dosage error in article text. PMID: 17762286

Quality of the study: Randomized, mono-center, prospective, standard of care-controlled, double-blinded

Link to study: <https://pubmed.ncbi.nlm.nih.gov/17762286/>

Title: "Efficacy of epidural perineural injections with autologous conditioned serum for lumbar radicular compression: an investigator-initiated, prospective, double-blind, reference-controlled study"

A more comprehensive bibliography

2022

1. Hashemi M, Moemenzadeh S, Taheri M, et al. Transforaminal Epidural Autologous Conditioned Serum Injection in the Treatment of Unilateral Lumbar Radicular Pain: A Randomized, Controlled, Double-Blind Clinical Trial. Published online 2022. doi:10.31661/gmj.v11i.2324
2. Raeissadat, S. A., Rayegani, S. M., Jafarian, N., & Heidari, M. (2022). Autologous conditioned serum applications in the treatment of musculoskeletal diseases: a narrative review. *Future Science OA*, 8(2), 14–27. DOI: 10.2144/fsoa-2021-0088.
3. Garbin LC, Contino EK, Olver CS, Frisbie DD. A safety evaluation of allogeneic freeze-dried platelet-rich plasma or conditioned serum compared to autologous frozen products equivalents in equine healthy joints. *BMC Vet Res*. 2022;18(1):1-11. doi:10.1186/s12917-022-03225-4.
4. Hosny OH, Abd-elkareem M, Ali MM, Ahmed AF. Effect of Autologous Serum Derived from Advanced Platelet-rich Fibrin on the Healing of Experimentally-induced Corneal Ulcer in Donkeys (*Equus asinus*). *J Adv Vet Res*. 2022;12(1):73-85.
5. Gholian S, Pishgahi A, Shakouri SK, et al. Use of autologous conditioned serum dressings in hard-to-heal wounds: a randomised prospective clinical trial. *J Wound Care*. 2022;31(1):68-77. doi: 10.12968/jowc.2022.31.1.68. PMID: 35077207.
6. Baykara G, Sungur N, Ozer K, et al. Autologous Conditioned Serum Increases Fat Graft Viability More than Platelet-Rich Plasma in a Controlled Rat Model. *Plast Reconstr Surg*. 2022;Publish Ah. doi:10.1097/PRS.0000000000009029.
7. Feldt J, Donaubauer A-J, Welss J, Schneider U, Gaipf US, Paulsen F. Anti-inflammatory effects of an autologous gold-based serum therapy in osteoarthritis patients. *Sci Rep*. 2022;12(1):1-7. doi: 10.1038/s41598-022-07187-3.
8. Coşkun HS, Yurtbay A, Say F. Platelet Rich Plasma Versus Autologous Conditioned Serum in Osteoarthritis of the Knee: Clinical Results of a Five-Year Retrospective Study. *Cureus*. 2022;1(4):1-12. doi: 10.7759/cureus.24500.
9. Cortegiani A, Ippolito M, Spurio G, Alongi A. Use of autologous conditioned serum (ACS-ORTHOKINE) for osteoarthrosic chronic pain and facet joint syndrome: a

prospective observational study. *Qeios*, CC-BY 4.0. Published online 2022:1-7. doi: 10.32388/2PSUHM.

10. Tokawa PKA, Brossi PM, Baccarin RYA. Autologous conditioned serum in equine and human orthopedic therapy: A systematic review. *Res Vet Sci*. 2022;146:34-52. doi:10.1016/j.rvsc.2022.03.009. PMID: 35325755.

11. Knott LE, Fonseca-Martinez BA, O'Connor AM, Goodrich LR, McIlwraith CW, Colbath AC. Current use of biologic therapies for musculoskeletal disease: A survey of board-certified equine specialists. *Vet Surg*. 2022;51(4):557-567. doi:10.1111/vsu.13805.

12. Teusch C, Derveaux C. Orthobiologics bei Tendopathien. *Sportärztezeitung*. Published online 2022:1-7.

13. Hale JN, Hughes KJ, Hall S, Labens R. The effect of exercise on cytokine concentration in equine autologous conditioned serum. *Equine Vet J*. Published online May 15, 2022. doi:10.1111/evj.13586.

14. Torab Z, Mohammadi H. Autologous Conditioned Serum for Implant Site Enhancement. *J Adv Periodontol Implant Dent*. Published online April 12, 2022. doi:10.34172/japid.2022.005.

15. Aghamohammadi D, Sharifi S, Shakouri SK, Eslampour Y, Dolatkhan N. Autologous conditioned serum (Orthokine) injection for treatment of classical trigeminal neuralgia: results of a single-center case series. *J Med Case Rep*. 2022;16(1):183. doi:10.1186/s13256-022-03393-9.

16. Sodavarapu P, Goni VG, Ghosh A, Patel S, Kumar V, Kumar S. Autologous Conditioned Serum in Lumbar and Cervical Radiculopathy: A Systemic Review. In: *Biomedical Translational Research*. Springer Nature Singapore; 2022:51-66. doi:10.1007/978-981-16-8845-4_4.

17. Baccarin RYA, Seidel SRT, Michelacci YM, Tokawa PKA, Oliveira TM. Osteoarthritis: a common disease that should be avoided in the athletic horse's life. *Anim Front*. 2022;12(3):25-36. doi:10.1093/af/vfac026.

18. Kerscher M, Wagner-Schiffler S, Noah EM, et al. Cell-Free Blood Cell Secretome (BCS) Counteracts Skin Aging: Multi-Center Prospective Regenerative Aesthetic Medicine Study Using Exokine®. *Clin Cosmet Investig Dermatol*. 2022;Volume 15:1157-1173. doi:10.2147/CCID.S357810.

19. Kumar KS. Evaluating the effectiveness of Autologous Conditioned Serum (ACS) & Platelet-Rich Plasma (PRP) in Early Osteoarthrosis of Knee. In: *New Horizons in*

Medicine and Medical Research Vol. 12. Book Publisher International (a part of SCIENCEDOMAIN International); 2022:81-90. doi:10.9734/bpi/nhmmr/v12/2398A.

20. Ipek D, Çalbiyık M, Zehir S. Intratendinous Injection of Autologous Conditioned Serum for Treatment of Lateral Epicondylitis of the Elbow: A Pilot Study. *Arch Iran Med.* 2022;25(May):319-323. doi:10.34172/aim.2022.52.
21. Nwazota N, Hegazi A. Regenerative Therapies. In: Multidisciplinary Spine Care. Springer International Publishing; 2022:711-722. doi:10.1007/978-3-031-04990-3_30.
22. Bies M, Ashmore Z, Qu W, Hunt C. Injectable Biologics for Neuropathic Pain: A Systematic Review. *Pain Med.* Published online April 28, 2022. doi:10.1093/pm/pnac066.
23. Koduru, S. K. Investigating the Role of Autologous Conditioned Serum in Triangular Fibrocartilage Complex Injuries. *Current Practice in Medical Science Vol. 6,* July 2022, pp. 69-80, doi:10.9734/bpi/cpms/v6/2397A.
24. Godek P, Szczepanowska-Wolowiec B, Golicki D. GOLDIC therapy in degenerative lumbar spinal stenosis: randomized, controlled trial. *Regen Med.* 2022;1. doi:10.2217/rme-2022-0047.
25. Löfgren M, Ekman S, Ekholm J, et al. Conditioned serum in vitro treatment of chondrocyte pellets and osteoarthritic explants. *Equine Vet J.* Published online May 6, 2022. doi:10.1111/evj.13582. PMID: 35514185.
26. Schneider U. First results of Gold-induced activated serum injections (GOLDIC®) for Dupuytren disease. White Paper on ArthroGen Website. Accessed August 2022.
27. Loppnow ZR, Janke J, Klein CE, Tatarskiuk DM. Traumatic synovial herniation of the medial femorotibial joint as an aetiology of hindlimb lameness in a horse. *Equine Vet Educ.* 2022;(June):1-5. doi:10.1111/eve.13704.
28. Bülbül AM, Hakyemez ÖS. Use of autologous conditioned serum (ACS) in orthopaedics and traumatology Ortopedi ve travmatolojide otolog şartlandırılmış serum (ACS) kullanımı. *TOTBİD Derg.* Published online 2022:521-525. doi:10.5578/totbid.dergisi.2022.72

29. Ozer K. COVID-19-associated Cytokine Release Syndrome and Autologous Conditioned Serum: A Hypothesis. *Explor Res Hypothesis Med.* 2021;000(000):000-000. doi:10.14218/ERHM.2021.00006
30. Simon MJK, Aartsen VE, Coghlan JA, Strahl A, Bell SN. Shoulder injections with autologous conditioned serum reduce pain and disability in glenohumeral osteoarthritis: longitudinal observational study. *ANZ J Surg.* 2021 Feb 20; DOI: 10.1111/ans.16672. PMID: 33609074.
31. Schneider U, Hollands P. Intravenous gold-induced autologous serum injection therapy (Go ACT®) as a new treatment for seasonal pollen-based allergies. *Eur Rev Med Pharmacol Sci.* 2021;25(11):4121-4127. doi:10.26355/eurev_202106_26055.
32. Schneider U, Murrell WD, Hollands P. The regeneration of damaged connective tissue: wishful thinking or reality ? *CellR4.* Published online 2021:1-11. doi:10.32113/cellr4_20215_3171.
33. Feldt J, Wells J, Schneider U, Paulsen F. Gold-based blood serum treatment promotes wound closure of corneal epithelial cell defects in primary in vitro experiments. *Ann Anat.* Published online April 24, 2021:151745. doi:10.1016/j.aanat.2021.151745.
34. Schneider U, Lotzof K, Murrell WD, Hollands P. Safety and efficacy of systemically administered autologous Gold-Induced Cytokines (GOLDIC®). *CELLR4.* Published online 2021:1-9. doi:10.32113/cellr4_20214_3132.
35. Camargo Garbin L, Morris MJ. A Comparative Review of Autologous Conditioned Serum and Autologous Protein Solution for Treatment of Osteoarthritis in Horses. *Front Vet Sci.* 2021 Feb 19;8(February):1–7. DOI: 10.3389/fvets.2021.602978.
36. Doyscher R, Martin Bartsch. Injizierbare Blutderivate. *sportärztezeitung.* 1/2021;
37. Woodell-May J, Steckbeck K, King W. Potential Mechanism of Action of Current Point-of-Care Autologous Therapy Treatments for Osteoarthritis of the Knee—A Narrative **Review**. *Int J Mol Sci.* 2021 Mar 8;22(5):2726. DOI: 10.3390/ijms22052726.
38. Leone R, Rosa A, Iudicone P et al. (2021). Pain control and functional improvement in patients treated by autologous conditioned serum after failure of

platelet rich plasma treatments in knee osteoarthritis. *Transfusion Medicine*, 12(June), tme.12801. [DOI: 10.1111/tme.12801](https://doi.org/10.1111/tme.12801). PMID: 34189774.

39. Kubrova E, D'Souza RS, Hunt CL, Wang Q, van Wijnen AJ, Qu W. Injectable Biologics: What is the Evidence? *Am J Phys Med Rehabil*. 2020 Mar 19; PMID: 32209835.

40. Ribitsch I, Oreff GL, Jenner F. Regenerative Medicine for Equine Musculoskeletal Diseases. *Anim an open access J from MDPI*. 2021 Jan 19;11(1):234. PMID: 33477808.

41. Hussein M, van Eck CF, Kregar Velikonja N. Bone Marrow Aspirate Concentrate Is More Effective Than Hyaluronic Acid and Autologous Conditioned Serum in the Treatment of Knee Osteoarthritis: A Retrospective Study of 505 Consecutive Patients. *Appl Sci*. 2021 Mar 25;11(7):2932. DOI: 10.3390/app11072932.

42. Schneider U, Kumar A, Murrell W, Ezekwesili A, Yurdi NA, Maffulli N. Intra-articular gold induced cytokine (GOLDIC®) injection therapy in patients with osteoarthritis of knee joint: a clinical study. *Int Orthop*. 2021 Feb 6;45(2):497–507. DOI: 10.1007/s00264-020-04870-w.

43. Kersch, M., Hertz-Kleptow, D., Drabik, A., Kaptan, T., & Reinecke, J. (2021). Cell-Free Blood Cell Secretome (BCS) Counteracts Skin Aging and Restores Firmness and Elasticity. *J Drugs Dermatol*, 20(6). [DOI: 10.36849/JDD.5018](https://doi.org/10.36849/JDD.5018). PMID 34076388.

44. Khurana, A., Goyal, A., Kirubakaran, P., Akhand, G., Gupta, R., & Goel, N. (2021). Efficacy of Autologous Conditioned Serum (ACS), Platelet-Rich Plasma (PRP), Hyaluronic Acid (HA) and Steroid for Early Osteoarthritis Knee: A Comparative Analysis. *Indian Journal of Orthopaedics*, 55(Suppl 1), 217–227. [DOI: 10.1007/s43465-020-00274-5](https://doi.org/10.1007/s43465-020-00274-5). PMID: 34122773. **Clinical Study.**

45. Tomlinson, F., Terschuur, J., & Henson, F. (2021). Use of autologous products for the treatment of joint and soft tissue disease in horses: A systematic review. *Veterinary Record*, 188(2). [DOI: 10.1002/vetr.9](https://doi.org/10.1002/vetr.9).

46. Story, M. R., Haussler, K. K., Nout-Lomas, Y. S., Aboellail, T. A., Kawcak, C. E., Barrett, M. F., Frisbie, D. D., & McIlwraith, C. W. (2021). Equine Cervical Pain and Dysfunction: Pathology, Diagnosis and Treatment. *Animals: An Open Access Journal from MDPI*, 11(2), 422. [DOI: 10.3390/ani11020422](https://doi.org/10.3390/ani11020422). PMID: 33562089.

47. Strümper, R. W., Reinecke, J., Rechmeier, J. W., & Wehling, P. (2021). A Combination of Tisseel Fibrin Glue and Orthokine ACS improves Knee Meniscus Injury

Treatment and helps Avoid Surgery 4-year follow-up Archive Study. *Sports Injuries & Medicine*, 5(1), 1–8. DOI: [10.29011/2576-9596.110172](https://doi.org/10.29011/2576-9596.110172).

48. Hale J, Hughes K, Hall S, Labens R. Effects of Production Method and Repeated Freeze Thaw Cycles on Cytokine Concentrations and Microbial Contamination in Equine Autologous Conditioned Serum. *Front Vet Sci*. 2021;8(November): 759828. doi: 10.3389/fvets.2021.759828.

49. Shakouri SK, Dolati S, Santhakumar J, Thakor AS, Yarani R. Autologous conditioned serum for degenerative diseases and prospects. *Growth Factors*. Published online December 9, 2021:1-12. doi:10.1080/08977194.2021.2012467.

50. Anil U, Markus DH, Hurley ET, Manjunath AK, Alaia MJ, Campbell KA, Jazrawi LM, Strauss EJ. The efficacy of intra-articular injections in the treatment of knee osteoarthritis: A network meta-analysis of randomized controlled trials. *Knee*. 2021 Oct;32:173-182. doi: 10.1016/j.knee.2021.08.008. Epub 2021 Sep 6. PMID: 34500430.

51. Anitua E, Pino A, Zalduendo M. Long-term stability of a novel platelet-rich plasma-based topical serum for cutaneous applications. *J Cosmet Dermatol*. 2021;20(3):854-861. doi:10.1111/jocd.13617.

2020

52. Vitali M, Ometti M, Drossinos A, Pironti P, Santoleri L, Salini V. (2020) Autologous conditioned serum: clinical and functional results using a novel disease modifying agent for the management of knee osteoarthritis. *J Drug Assess*. Taylor & Francis; 2020;9(1):43–51. PMID: 32284907 DOI: [10.1080/21556660.2020.1734009](https://doi.org/10.1080/21556660.2020.1734009).

53. Marques-Smith P, Kallerud AS, Johansen GM, et al. Is clinical effect of autologous conditioned serum in spontaneously occurring equine articular lameness related to ACS cytokine profile? *BMC Vet Res*. BMC Veterinary Research; 2020;16(1):181. PMID: 32513154.

54. Godek P, Szajkowski S, Golicki D. Evaluation of the Effectiveness of Orthokine Therapy: Retrospective Analysis of 1000 Cases. *Ortop Traumatol Rehabil*. 2020 Apr 30;22(2):107–119. PMID: 32468996.

55. Bursac LO. Injection with autologous conditioned serum has better clinical results than physical therapy for knee osteoarthritis. *Osteoarthr Cartil*. Elsevier Ltd; 2020;28(2020):S521. DOI: 10.1016/j.joca.2020.02.819.

56. Angadi DS, Macdonald H, Atwal N. Autologous cell-free serum preparations in the management of knee osteoarthritis: what is the current clinical evidence? *Knee Surg Relat Res. Knee Surgery & Related Research*; 2020 Dec 23;32(1):16.
57. Buchheit T, Huh Y, Maixner W, Cheng J, Ji R-R. Neuroimmune modulation of pain and regenerative pain medicine. *J Clin Invest.* 2020 Apr 6; PMID: 32250346.
58. Shirokova L, Noskov S, Gorokhova V, Reinecke J, Shirokova K. Intra-Articular Injections of a Whole Blood Clot Secretome, Autologous Conditioned Serum, Have Superior Clinical and Biochemical Efficacy Over Platelet-Rich Plasma and Induce Rejuvenation-Associated Changes of Joint Metabolism: A Prospective, Controlled Open-Label Clinical Study in Chronic Knee Osteoarthritis. *Rejuvenation Res.* 2020 Feb 10;rej.2019.2263. PMID: 31847701.
59. Pishgahi A, Abolhasan R, Shakouri SK et al. Effect of Dextrose Prolotherapy, Platelet Rich Plasma and Autologous Conditioned Serum on Knee Osteoarthritis: A Randomized Clinical Trial. *Iran J Allergy, Asthma Immunol.* 2020 Jun 29;19(June):243–252. DOI: 10.18502/ijaai.v19i3.3452.
60. Hashemi M, Adlkhoo H, Dadkhah P, Rohanifar R, Taheri M. A Comparative Assessment of Autologous Conditioned Serum and Ozone for Knee Osteoarthritis Treatment: Mid-Term Follow up. *Nov Biomed.* 2020;8(1):45–52.
61. Velloso Alvarez A, Boone LH, Pondugula SR, Caldwell F, Wooldridge AA. Effects of Autologous Conditioned Serum, Autologous Protein Solution, and Triamcinolone on Inflammatory and Catabolic Gene Expression in Equine Cartilage and Synovial Explants Treated With IL-1 β in Co-culture. *Front Vet Sci.* 2020;7(June):1–11.
62. Doyscher R, Brucker P. PRP, ACS, BCS Überblick über die Bedeutung injizierbarer Blutderivate in der Sportmedizin. *sportärztezeitung.* 2020;01:16–20.
63. Yogev Y. A Humoral Solution: Autologous Blood Products and Tissue Repair. *Cell Immunol.* 2020 Jul;104178. DOI: [10.1016/j.cellimm.2020.104178](https://doi.org/10.1016/j.cellimm.2020.104178).
64. Ralph Kürschner, Jan Schilling. Schulterverletzungen bei Wassersportlern. *sportärztezeitung.* 2020;03

65. Genç E, Yüksel S, Çağlar A, Beytemur O, Güleç MA. Comparison on effects of platelet-rich plasma versus autologous conditioned serum on Achilles tendon healing in a rat model. *Acta Orthop Traumatol Turc.* 2020;54(4):438–444. PMID: 32812877.
66. Ibraheim HK, Al-asadi RN. Monitoring Of The Repair Process Of Surgically Created Lesions In Bucks Superficial Digital Flexor Tendons By The Use Of Autologous Conditioned Serum Clinical And Ultrasonographical Study. *Plant Arch.* 2020;20(2):7097-7106.
67. Godek P, Murawski P, Ruciński W, Guzek M. Biological, Mechanical or Physical? Conservative Treatment of Cervical Radiculopathy. *Ortop Traumatol Rehabil.* 2020; 22 (6): 407-416.
68. Shakouri SK, Roshangar L, Mahmoodpoor A. Intratracheal administration of autologous conditioned serum for COVID-19 associated respiratory distress syndrome. *J Crit Care.* 2020 Aug 20;60:209–211. PMID: 32871418.
69. Melo SNS, Ezekwesili A, Yurdi NA, Murrell WD, Maffulli N. Gold-Induced Cytokine (GOLDIC®) Injection Therapy in Patient with Plantar Fasciosis: A Case Report. *Indian J Orthop.* 2020;54(3):348-351. doi:10.1007/s43465-020-00089-4.
70. Anitua E, Troya M, Goñi F, Gómez P, Tierno R, Pino A. A Novel autologous topical serum based on plasma rich in growth factors technology counteracts ultraviolet light-derived photo-oxidative stress. *Skin Pharmacol Physiol.* 2020;33(3):67-81. doi:10.1159/000507716.

2019

71. Lasarzik de Ascurra J, Ehrle A, Einspanier R, Lischer C. (2019) Influence of Incubation Time and Incubation Tube on the Cytokine and Growth Factor Concentrations of Autologous Conditioned Serum in Horses. *J equine Vet Sci.* 2019 Apr;75:30–34. PMID: 31002089. DOI: 10.1016/j.jevs.2018.12.015.
72. von Wehren L, Pokorny K, Blanke F, Sailer J, Majewski M. (2019) Injection with autologous conditioned serum has better clinical results than eccentric training for chronic Achilles tendinopathy. *Knee Surg Sports Traumatol Arthrosc.* Springer Berlin Heidelberg; 2019 Mar 21; PMID: 30900032. DOI: 10.1007/s00167-019-05465-8.

73. Santoleri L. La nuova frontiera della medicina rigenerativa [Internet]. Transfusion Medicine Network. 2018 [cited 2019 Jan 22]. Available from: [http://www.invenadisapere.it/insertocultura/nopage/Medicina rigenerativa](http://www.invenadisapere.it/insertocultura/nopage/Medicina_rigenerativa).
74. Zhang T, Liu J, Zheng X, Zhang B, Xia C. Different roles of Akt and mechanistic target of rapamycin in serum-dependent chondroprotection of human osteoarthritic chondrocytes. *Int J Mol Med*. 2018;41(2):977-984. doi:10.3892/ijmm.2017.3285. PMID: 29207056.
75. Kılınç BE, Öç Y. Evaluation of the autologous conditioned serum in the treatment of osteoarthritis. *Arch Clin Exp Med*. 2019;4(2):94–98. DOI: 10.25000/acem.569936.
76. Ajrawat P, Dwyer T, Chahal J. (2019) Autologous Interleukin 1 Receptor Antagonist Blood-Derived Products for Knee Osteoarthritis: A Systematic Review. *Arthroscopy*. Arthroscopy Association of North America; 2019 Jul;35(7):2211–2221. PMID: 31272643. [DOI: 10.1016/j.arthro.2018.12.035](https://doi.org/10.1016/j.arthro.2018.12.035).
77. Blázquez R, Sánchez-Margallo FM, Reinecke J, Álvarez V, López E, Marinaro F, Casado JG. (2019) Conditioned Serum Enhances the Chondrogenic and Immunomodulatory Behavior of Mesenchymal Stem Cells. *Front Pharmacol*. 2019 Jun 28;10(June):699. PMID: 31316380. DOI: 10.3389/fphar.2019.00699.
78. Hashemi M, Taheri M, Adlkhoo H, Dadkhah P, Abbasian MR. Comparison of The Effect of Intra-Articular Injection of Autologous (Orthokine) Interleukin-1 (IL-1Ra) Receptor Antagonist and Hyaluronic Acid in Pain Control of Knee Osteoarthritis. *Nov Biomed*. 2019;7(4):210–217.
79. Leone R, DeRosa A, Iudicone P, Fioravanti D, Capua G, Rossetti F, Lavorino C, Costantino S, Pierelli L. Impiego Di Siero Autologo Condizionato (ACS - Orthokine) In Pazienti Affetti Da Gonartrosi Resistenti Al Trattamento Con Plasma Ricco Di Piastrine. Use of Conditioned Autologous Serum (ACS - Orthokine) in Patients with Gonarthrosis Resistant to Treatment with PRP. SIMTI, Rimini; 2019. p. 108.
80. Machado TSL, Massoco CO, Silva LCLC, Fülber J, Moreira JJ, Baccarin RYA. Effects of blood-derived products and sodium hyaluronate on equine synovial fluid cells and on synovial fluid from osteochondrotic joints of horses after arthroscopy and administration of treatment. *Am J Vet Res*. 2019;80(7):646–656.

81. Linardi RL, Dodson ME, Moss KL, King WJ, Ortvad KF. The Effect of Autologous Protein Solution on the Inflammatory Cascade in Stimulated Equine Chondrocytes. *Front Vet Sci.* 2019;6(March):1–9.
82. Billigmann P-W. Knie-Arthrose. Option intra-artikuläre Injektionen. *sportärztezeitung.* 2019;1.
83. Schmid O, Than P. Infiltrationstherapie bei Rückenschmerzen. Beispiel Golfport. *sportärztezeitung.* 2019;2:44–45.
84. Petermann J. Intraartikuläres BCS. Innovative Ergänzung innerhalb der operativen VKB-Behandlung. *sportärztezeitung.* 2019;4.
85. Patel S, Bansal T, Sharma S. Future trends in Orthobiologics for use in Osteoarthritis Knee. *Asian J Arthrosc.* 2019;4(3):33–38.
86. Shirmohammadi A. Autologous conditioned serum and treatment of periodontal diseases. *J Adv Periodontol Implant Dent.* 2019 Dec 18;11(2):54–62. DOI: 10.15171/japid.2019.008.
87. Wehling J. Genetic polymorphisms underlying pain report and treatment response of different intra-articular therapeutic modalities – autologous conditioned serum (ACS), hyaluronic acid (HA) and placebo (PL) - in patients suffering from symptomatic midstage knee osteoarthritis. Ludwig-Maximilians-Universität zu München. Ludwig-Maximilians-Universität zu München; 2019. DOI: [10.5282/edoc.24247](https://nbn-resolving.org/urn:nbn:de:bvb:19-242479). URN: [urn:nbn:de:bvb:19-242479](https://nbn-resolving.org/urn:nbn:de:bvb:19-242479).
88. Sole L, Beck A, Barnette T, Vergne-salle P. Autologous Conditioned Serum and Plasma Rich in Growth Factors Show Stronger Evidence of Efficacy Than Other Kinds of Platelet-Rich Plasma. 2019 ACR/ARP Annu Meet. p. 1–3.
89. Aminkov K. Regenerative therapies for treatment of osteoarthritis (oa) in dogs. review. *Tradit Mod Vet Med.* 2019;4(2):81–85.

2018

90. Tassara M, De Ponti A, Barzizza L, Zambelli M, Parisi C, Milani R, Santoleri L. Autologous conditioned serum (ACS) for intra-articular treatment in Osteoarthritis:

Retrospective report of 28 cases. *Transfus Apher Sci.* 2018 Aug;57(4):573–577. PMID: 30131208.

91. Warner RK. Autologes Conditioniertes Serum (ACS) in der Behandlung von Osteoarthritis des Hufgelenks und Komplikationen nach intraartikulärer Anwendung beim Pferd. Freie Universität Berlin. Freie Universität Berlin; 2018.

92. De Ponti A. Efficacia clinica e profilo di sicurezza del trattamento con siero autologo Risultati di uno studio retrospettivo in Italia Clinical outcome and safety of autologous conditioned serum (ACS - Orthokine®) in orthopedics. A retrospective study in Italy. *G Ital di Ortop e Traumatol.* 2018;287–293.

93. Genç E, Beytemur O, Yuksel S, Eren Y, Çağlar A, Küçükyıldırım BO, Güleç MA. Investigation of the biomechanical and histopathological effects of autologous conditioned serum on healing of Achilles tendon. *Acta Orthop Traumatol Turc.* 2018;52(3):226–231. PMID: 29454565.

94. Damjanov N, Barac B, Colic J, Stevanovic V, Zekovic A, Tulic G. The efficacy and safety of autologous conditioned serum (ACS) injections compared with betamethasone and placebo injections in the treatment of chronic shoulder joint pain due to supraspinatus tendinopathy: a prospective, randomized, double-blind, control. *Med Ultrason.* 2018 Aug 30;20(3):335–341. PMID: 30167587.

95. Lasarzik J, Bondzio A, Rettig M, Estrada R, Klaus C, Ehrle A, Einspanier R, Lischer CJ. Evaluation of Two Protocols Using Autologous Conditioned Serum for Intra-articular Therapy of Equine Osteoarthritis—A Pilot Study Monitoring Cytokines and Cartilage-Specific Biomarkers. *J Equine Vet Sci. Elsevier Ltd;* 2018 Jan;60:35-42.e2.

96. Fotouhi A, Maleki A, Dolati S, Aghebati-Maleki A, Aghebati-Maleki L. Platelet rich plasma, stromal vascular fraction and autologous conditioned serum in treatment of knee osteoarthritis. *Biomed Pharmacother.* 2018 Aug;104:652–660. PMID: 29803179.

97. Rajca J, Ficek K, Racut A. New approaches in the ortobiological therapy. *Eng Biomater.* 2018;21(148):75.

98. Lundgren J. Autologous Conditioned Serum and Platelet Rich Plasma Content and use in equine osteoarthritis and tendon injuries. Uppsala. Swedish University of Agricultural Sciences, Uppsala; 2018.

99. Godek P. Spinal injections under the control of computed tomography with laser navigation. *MOJ Sport Med.* Published online 2018:69-73. doi:10.15406/mojism.2018.02.00049.

100. Anitua E, Pino A, Troya M. Biological Stability of Plasma Rich in Growth Factors-Derived Autologous Topical Serum After Three-Months Storage. *J Drugs Dermatol.* 2018;17(10):1115-1121. <http://www.ncbi.nlm.nih.gov/pubmed/30365593>.

2017

101. Pecin M et al.: Accelerated Achilles tendon healing with interleukin-1 receptor antagonist protein in rabbits. *Turk J Vet Anim Sci*, (2017) 41: 118-126; TÜBİTAK doi:10.3906/vet-1604-32.

102. Arbel R. (2017). Bio-orthopaedics: A new approach. Orthokine. In A. Gobbi, J. G. Lane, J. Espregueira-Mendes, & M. Karahan (Eds.), *Bio-orthopaedics: A New Approach* (pp. 1–696). ISAKOS. DOI: 10.1007/978-3-662-54181-4.

103. Oc Y. Autologous conditioned serum treatment in the knee osteoarthritis. *Ann Eurasian Med.* 2017 Jan 1;5(1):17–21. Doi: 10.4328/AEMED.105.

104. Wehling P, Evans C, Wehling J, Maixner W. Effectiveness of intra-articular therapies in osteoarthritis: a literature. *Ther Adv Musculoskelet Dis.* 2017 Aug 20;9(8):183–196. PMID: 28835778

105. Caggiari, G., Uboldi, F. M., Mosele, G. R., Donato, A., Puddu, L., & Manunta, A. (2017). Chondroprotective Effects of Intra-Articular Autologous Conditioned Serum (ACS) Injection A Human Literature. *International Journal of Innovative Science, Engineering & Technology*, 4(3), 289–293.

106. K. Shirokova L. Shirokova, S. N. (2017). Comparison Of Clinical Efficacy Of Platelet-Rich Plasma And Autologous Conditioned Serum Treatment In Patients With Osteoarthritis Of The Knee. In *OARSI World Congress 2017*. Abstract 724.

107. Warner K, Lischer CJ. Komplikationen nach intraartikularer Anwendung von ACS (IRAP®) beim Pferd - Retrospektive Studie. Complications after intra-articular application of ACS (IRAP®) in horses – retrospective study. *Pferdeheilkunde.* 2017;33(4):356–362. DOI: 10.21836/PEM20170405.

108. Schneider U, Wallich R, Felmet G, Murrell WD. Gold-Induced Autologous Cytokine Treatment in Achilles Tendinopathy. In: Al. C et, ed. *Muscle and Tendon Injuries*. Springer Berlin Heidelberg; 2017:411-419. doi:10.1007/978-3-662-54184-5_39.
109. Cordes F, Curaj A, Simseyilmaz S, Schneider U, Liehn EA. Anti-inflammatory Gold-Induced Autologous Cytokines treatment triggers heart failure after myocardial infarction. *Discov (Craiova, Rom.* 2017;5(4):e80. doi:10.15190/d.2017.10.
110. Romero García A, Torres Hortelano J, Rodríguez Ramírez De Arellano T, Wehling P. Intraarticular TMJ Injections of Autologous Conditioned Serum In The Treatment of Temporomandibular Joint Osteoarthritis: Description Of The Procedure And Development Of A Pilot Study. EACD Barcelona. 2017. p. 2013.
111. Strümper R. Intra-Articular Injections of Autologous Conditioned Serum to Treat Pain from Meniscal Lesions. *Sport Med Int open.* 2017 Oct 29;1(6):E200–E205. PMID: 30539108.
112. Chen X, Wang J, Li YJ. Purification and cytokine profile of autologous conditioned serum. *Chinese J Tissue Eng Res.* 2017;21(24):3894–3899. DOI: 10.3969/j.issn.2095-4344.2017.24.021. PMID 29207056.
113. Lasarzik J. Interleukin-1 receptor antagonist and interleukin-1 beta levels in equine synovial fluid of normal and osteoarthritic joints and the influence of two different autolougous conditioned serum treatment intervals on cytokine and cartilage biomarker levels in. *Freie Univ Berlin*. Published online 2017.
114. Barreto A. A short report on the effect of decreased incubation time on the architectural profile of autologous conditioned serum (ACS). *Cytokine.* 2017;94:52-54. doi:10.1016/j.cyto.2017.03.019.

2016

115. Aartsen VE. (2016) Intra-articular injections of Orthokine reduce symptoms of pain and disability in patients with glenohumeral osteoarthritis . Theses Univ. Groningen; 2016.

116. Moser C. Wirksamkeit und Sicherheit intraartikulärer Osteoarthritis-Behandlung mit autologem, konditioniertem Serum (Autologous Conditioned Serum - ACS) Akronym: German Orthokine OsteoArthritis Trial - GOAT. Orthopädische Klinik. Heinrich- Heine Universität Düsseldorf; 2016.
117. Brodd S. Behandling med autologt konditionerat serum vid osteoartrit hos häst. Autologous conditioned serum for treatment of osteoarthritis in the horse. University Uppsala; 2016.
118. Crnogaca K, Bicanic G, Delimar D. (2016) Elevated CRP level could herald less efficient autologous conditioned serum (ACS) treatment. *Med Hypotheses*. 2016;86:135-7. doi: 10.1016/j.mehy.2015.11.001. Epub 2015 Nov 5. PubMed PMID: 26559885.
119. Wehling P, Moser C, Maixner W. (2016) How does surgery compare with advanced intra-articular therapies in knee osteoarthritis: current thoughts. *Ther Adv Musculoskelet Dis*. 2016 Jun;8(3):72-85. doi: 10.1177/1759720X16642405. Epub 2016. PubMed PMID: 27247634.
120. Richards MM, Maxwell JS, Weng L, Angelos MG, Golzarian J. (2016) Intra-articular treatment of knee osteoarthritis: from anti-inflammatories to products of regenerative medicine. *Phys Sportsmed*. 2016;44(2):101-8. doi: 10.1080/00913847.2016.1168272. Epub 2016 Apr 4. PubMed PMID: 26985986.
121. Sawyere D. Cytokine and Growth Factor Profiles in Canine Autologous Conditioned Serum. Virginia Polytechnic; 2016.
122. Sawyere DM, Lanz OI, Dahlgren LA, Barry SL, Nichols AC, Werre SR. (2016) Cytokine and Growth Factor Concentrations in Canine Autologous Conditioned Serum. *Vet Surg*. 2016 Jul;45(5):582-6. doi: 10.1111/vsu.12506. PubMed PMID: 27357270.
123. Ionita CR, Troillet AR, Vahlenkamp TW, Winter K, Brehm W, Ionita JC. (2016) Comparison of humoral insulin-like growth factor-1, platelet-derived growth factor-BB, transforming growth factor- β 1, and interleukin-1 receptor antagonist concentrations among equine autologous blood-derived preparations. *Am J Vet Res*. 2016 Aug;77(8):898-905. doi: 10.2460/ajvr.77.8.898. PubMed PMID: 27463555.

124. Evans CH, Chevalier X, Wehling P. (2016) Autologous Conditioned Serum. *Phys Med Rehabil Clin N Am.* 2016 Nov;27(4):893-908. doi: 10.1016/j.pmr.2016.06.003. PubMed PMID: 27788906.
125. Godek P. (2016) Use of Autologous Serum in Treatment of Lumbar Radiculopathy Pain. Pilot Study. *Ortop Traumatol Rehabil.* 2016 Jan-Feb;18(1):11-20. doi: 10.5604/15093492.1198829. PubMed PMID: 27053305.
126. Warner K, Schulze T, Lischer C. Treatment of Osteoarthritis with ACS (IRAP®) on 26 horses – retrospective study. *Pferdeheilkd Equine Med.* 2016;32(3):241–248. DOI: 10.21836/PEM20160307
127. Pokorny KA. Effektivität der Injektion mit Autologem Conditioniertem Serum (ACS; Orthokin®) bei Amateur-Ausdauersportlern mit chronischer Tendinopathie der Achillessehne. University Basel; 2017.
128. Barreto A, Braun TR. A method to induce Interleukin-1 Receptor Antagonist Protein from autologous whole blood. *Cytokine.* 2016;81:137-141. doi:10.1016/j.cyto.2016.03.008.

2015

129. Frisbie DD. (2015) Autologous-conditioned serum: evidence for use in the knee. *J Knee Surg.* 2015 Feb;28(1):63-6. doi: 10.1055/s-0034-1543956. Epub 2015 Jan 19. PubMed PMID: 25599270.
130. Rey-Rico A, Reinecke J, Wehling P, Cucchiaroni M, Madry H. Effects of exosomes upon the metabolic activities of human osteoarthritic articular cartilage in situ. *Osteoarthr Cartil.* Elsevier Ltd; 2015 Apr;23(2015):A399.
131. Rutgers M, Creemers LB, Auw Yang KG, Raijmakers NJ, Dhert WJ, Saris DB. (2015) Osteoarthritis treatment using autologous conditioned serum after placebo. *Acta Orthop.* 2015 Feb;86(1):114-8. doi: 10.3109/17453674.2014.950467. Epub 2014 Aug PubMed PMID: 25140983.
132. Oliveira, Rafaela Andreia Crespo de. The use of autologous conditioned serum for articular lesions treatment in horses: a preliminary study. Lisboa. 2015;0. <http://hdl.handle.net/10400.5/9421>.

133. Huggins SS, Suchodolski JS, Bearden RN, Steiner JM, Saunders WB. (2015) Serum concentrations of canine interleukin-1 receptor antagonist protein in healthy dogs after incubation using an autologous serum processing system. *Res Vet Sci*. 2015 Aug;101:28-33. doi: 10.1016/j.rvsc.2015.05.012. Epub 2015. PubMed PMID: 26267085.
134. Patel DN, Strauss EJ. (2015) Alternative Therapeutic Modalities in Sports Medicine. *Bull Hosp Jt Dis* (2013). 2015 Jun;73(2):122-7. PubMed PMID: 26517165.
135. Geburek F, Lietzau M, Beineke A, Rohn K, Stadler PM. (2015) Effect of a single injection of autologous conditioned serum (ACS) on tendon healing in equine naturally occurring tendinopathies. *Stem Cell Res Ther*. 2015 Jun 26;6:126. doi: 10.1186/s13287-015-0115-0. PubMed PMID: 26113022.
136. Torrero JI, Martínez C. (2015) New developments in the treatment of osteoarthritis -focus on biologic agents. *Open Access Rheumatol*. 2015 Jul 22;7:33-43. eCollection 2015. PubMed PMID: 27790043.
137. Goni VG, Singh Jhala S, Gopinathan NR, Behera P, Batra YK, R H H A, Guled U, Vardhan H. (2015) Efficacy of Epidural Perineural Injection of Autologous Conditioned Serum in Unilateral Cervical Radiculopathy: A Pilot Study. *Spine (Phila Pa 1976)*. 2015 Aug 15;40(16):E915-21. doi: 10.1097/BRS.0000000000000924. PubMed PMID: 25893359.
138. Baselga García-Escudero J, Miguel Hernández Trillos P. (2015) Treatment of Osteoarthritis of the Knee with a Combination of Autologous Conditioned Serum and Physiotherapy: A Two-Year Observational Study. *PLoS One*. 2015 Dec 28;10(12):e0145551. doi: 10.1371/journal.pone.0145551. eCollection 2015. PubMed PMID: 26709697.
139. Tatarniuk DM, Groschen DM, Merritt KA, Maher MC, Ernst NS, Brown MP, Trumble TN. Concentrations of cytokines, matrix metalloproteinases, and tissue inhibitors of matrix metalloproteinases in autologous conditioned serum from horses with distal interphalangeal joint osteoarthritis. *Osteoarthr Cartil*. Elsevier Ltd; 2015;23(2015):A399–A400.
140. Tatarniuk DM. Autologous conditioned serum and subsequent synovial fluid concentrations of cytokines, matrix metalloproteinases, and tissue inhibitors of

metalloproteinases after injection into equine osteoarthritic distal interphalangeal joints. University MINNESOTA; 2015.

141. Kumar R, Goni VG, Y. K. B. Autologous Conditioned Serum as a Novel Alternative Option in the Treatment of Unilateral Lumbar Radiculopathy: A Prospective Study. *Asian Spine J.* 2015;9(6):916–922. doi: 10.4184/asj.2015.9.6.916. Epub 2015. PubMed PMID: 26713125.

142. Puhar I, Plančak D, Piskač M, Badovinac A, Vražić D, Božić D. Autologous conditioned serum as an adjunct to nonsurgical periodontal therapy of aggressive periodontitis. *J Clin Periodontol.* 2015;42(S17):118. <https://www.bib.irb.hr/769103>.

143. Moreira JJ, Moraes APL, Brossi PM, et al. Autologous processed plasma: cytokine profile and effects upon injection into healthy equine joints. *J Vet Sci.* 2015;16(1):47. doi:10.4142/jvs.2015.16.1.47.

144. Muruzabal FJ, Fuente M De, Riestra AC, Merayo-Iloves J, Anitua E, Merayo-Iloves J. Effects of autologous serum and plasma rich in growth factors (PRGF-Endoret) eye drops on ocular surface myofibroblast differentiation. *Invest Ophthalmol Vis Sci.* 2015;56(June):16-18.

2014

145. Moser C, Thiel HJ, Grönemeyer D. (2014) [Biotechnological therapies for the treatment of back pain: alternatives to corticosteroids]. *Orthopade.* 2013 Dec;42(12):1054-61. doi: 10.1007/s00132-013-2197-7. German. Retraction in: *Orthopade.* 2014 Jul;43(7):688. PubMed PMID: 24201832.

146. Vendruscolo CP, Alves ALG, Brossi PM, Baccarin RYA. Autologous conditioned serum and platelet-rich plasma in equine orthopedic therapeutics. *Uso do soro autólogo condicionado e do plasma rico em plaquetas na terapia ortopédica de equinos. Semin Ciências Agrárias.* 2014 Nov 5;35(5):2607.

147. Fathalla, M., Abd-El Motaal, F., Abdulkareem, O., & Elganzoury, A. (2014). Low-dose intra-articular autologous conditioned serum in treatment of primary knee osteoarthritis. *Egypt Rheumatol Rehabil* 2014, 41:98-102, 41(3), 98.

148. Magalon J, Bausset O, Veran J, Giraudo L, Serratrice N, Magalon G, Dignat-George F, Sabatier F. (2014) Physico-chemical factors influencing autologous conditioned serum purification. *Biores Open Access*. 2014 Feb 1;3(1):35-8. doi: 10.1089/biores.2013.0041. PubMed PMID: 24570844.
149. Fjordbakk CT, Johansen GM, Løvås AC, Oppegård KL, Storset AK. (2014) Surgical stress influences cytokine content in autologous conditioned serum. *Equine Vet J*. 2015 Mar;47(2):212-7. doi: 10.1111/evj.12277. Epub 2014 May 26. PubMed PMID: 24735323.
150. Astolfi M, McGuire K, Kaminski TW. (2014) The effectiveness of autologous conditioned serum in the treatment of knee osteoarthritis. *J Sport Rehabil*. 2014 Nov;23(4):365-9. doi: 10.1123/jsr.2013-0029. Epub 2014 May 2. PubMed PMID: 24810293.
151. Zhang T. A Certain Concentration of Serum Promotes Human OA Chondrocyte Survival by Increasing the Level of Autophagy. Xiamen University; 2014. <https://etd.xmu.edu.cn/detail.asp?serial=46723>;
152. Ferris RA, Frisbie DD, McCue PM. (2014) Use of mesenchymal stem cells or autologous conditioned serum to modulate the inflammatory response to spermatozoa in mares. *Theriogenology*. 2014 Jul 1;82(1):36-42. doi: 10.1016/j.theriogenology.2014.02.015. Epub 2014 Feb 27. PubMed PMID: 24681213.
153. Shirokova, L., Noskov, S. M., Shirokova, K. Y., Golikova, Y. V, Kozlova, O. G., & Bulanov, R. K. (2014). AB0981 Comparison of the efficacy of autologous conditioned serum and hyaluronic acid treatment in hip osteoarthritis. *Annals of the Rheumatic Diseases*, 71 (Suppl 3), 694.18-694. DOI: [10.1136/annrheumdis-2012-eular.981](https://doi.org/10.1136/annrheumdis-2012-eular.981).
154. Majewski, M., von Wehren, L., & Blanke, F. (2014). Treatment Of Achillodynia With Local Injections Of Autologous Conditioned Serum (acs). *British Journal of Sports Medicine*, 48(Suppl_2), A38–A39. DOI: 10.1136/bjsports-2014-094114.60.
155. Beyzadeoglu, T. (2014). Cytokines in Sports Medicine. *ISAKOS NEWSLETTER 2014: Volume I. Current Concepts*, 1–44.
156. Easter L, Watts AE. How to Select Cases and Use Autologous Conditioned Serum to Treat Proximal Suspensory Desmitis. *AAEP*. 2014. p. 1–7.

157. Fuente M De, Lloves JM-, Orive G, Fernandez- IO. Comparing the biological outcomes of autologous serum versus plasma rich in growth factors (PRGF-Endoret) eye drops on ocular surface wound healing. ARVO 2014 Annu Meet Abstr. Published online 2014:20091021.

2013

158. Frizziero A, Giannotti E, Oliva F, Masiero S, Maffulli N. (2013) Autologous conditioned serum for the treatment of osteoarthritis and other possible applications in musculoskeletal disorders. Br Med Bull. 2013;105:169-84. doi: 10.1093/bmb/lds016. Epub 2012 Jul 4. Review. PubMed PMID: 22763153.

159. Sandoval JA, López C, Carmona JU. (2013) Therapies intended for joint regeneration in the horse. Arch Med Vet. 2013;45(3):229–236. DOI: 10.4067/S0301-732X2013000300002

160. Alvarez-Camino JC, Vázquez-Delgado E, Gay-Escoda C. (2013) Use of autologous conditioned serum (Orthokine) for the treatment of the degenerative osteoarthritis of the temporomandibular joint. Review of the literature. Med Oral Patol Oral Cir Bucal. 2013 May 1;18(3):e433-8. PubMed PMID: 23524415.

161. Carlson ER, Stewart AA, Carlson KL, Durgam SS, Pondenis HC. (2013) Effects of serum and autologous conditioned serum on equine articular chondrocytes treated with interleukin-1b. Am J Vet Res. 2013 May;74(5):700-5. doi: 10.2460/ajvr.74.5.700. PubMed PMID: 23627382.

162. Pinto H, Garrido LG. (2013) Study to evaluate the aesthetic clinical impact of an autologous antiaging serum. J Drugs Dermatol. 2013 Mar;12(3):322-6. PubMed PMID: 23545916.

163. Baltzer AW, Ostapczuk MS, Stosch D, Seidel F, Granrath M. (2013) A new treatment for hip osteoarthritis: clinical evidence for the efficacy of autologous conditioned serum. Orthop Rev (Pavia). 2013 Jun 14;5(2):59-64. doi: 10.4081/or.2013.e13. Print 2013 Jun 7. PubMed PMID: 23888203.

164. Alarcon KAK. Proteína Antagonista De Receptores De Interleukina (IRAP) Y Sus Aplicaciones En La Traumatología Equina. Facultad De Ciencias Veterinarias. BUENOS AIRES; 2013.

165. Mitchell J. Does Autologous Conditioned IL-1 Antagonist (ACS) Reduce Pain in Patients with OA or Lumbar Radiculopathy? Philadelphia College of Osteopathic Medicine; 2013.

166. Morgensteren D, Lowe J, Ilisar I, Friedman A, Liebergall M. Adjunctive Biological Treatment for Degenerative Hip Disease with Focal Chondro Labral Defects. Poster 58. ISHA Annu Meet Munich. 2013. p. 1.

2012

167. Heisterbach PE, Todorov A, Flückiger R, Evans CH, Majewski M. (2012) Effect of BMP-12, TGF- β 1 and autologous conditioned serum on growth factor expression in Achilles tendon healing. *Knee Surg Sports Traumatol Arthrosc.* 2012 Oct;20(10):1907-14. Epub 2011 Nov 29. PubMed PMID: 22124845.

168. Shirokova L. NEW POSSIBILITIES OF LOCAL TREATMENT OF OSTEOARTHRITIS OF KNEE AND HIP JOINTS. University Yaroslavl; 2012.

169. Noskov SM, Shirokova Llu, Snigireva AV, Parulia OM, Dybin SD. (2012) [Efficiency of use of autologous activated serum in coxarthrosis]. *Ter Arkh.* 2012;84(8):33-6. Russian. PubMed PMID: 22994086.

170. Shirokova LY, Noskov SM, Shirokova KY, Golikova Y, Dybin SD. Comparative Evaluation Of The Clinical Effectiveness Of Low-Molecular Hyaluronic Acid And Autological Conditioned Serum In Osteoarthrosis Of Hip Joint. 28-29/09/2017 1st Congr Assoc Rheum Dis Surg. 2017.

171. Brossi PM, Baccarin RYA, Massoco CO. Do blood components affect the production of reactive oxygen species (ROS) by equine synovial cells in vitro? *Pesqui Veterinária Bras.* 2012 Dec;32(12):1355–1360. DOI: 10.1590/S0100-736X2012001200023

172. Harnacke P. Autologes konditioniertes Serum als Behandlung einer persistierenden post-breeding Endometritis bei Stuten. Hannover; 2012.

173. Yang C, Robbins PD. Immunosuppressive Exosomes: A New Approach for Treating Arthritis. *Int J Rheumatol.* 2012;2012:1–8. PMID: 22548070.

2011

174. Sobhee R. Isolation and characterization of therapeutic active exosomes for an anti-inflammatory exosomes based therapy of immunodisfunction disease as rheumatoid arthritis. Bachelor University Applied Science Bonn-Rhein-Sieg. 2011.
175. Geburek F, Stadler P. (2011) [Regenerative therapy for tendon and ligament disorders in horses. Terminology, production, biologic potential and in vitro effects]. Tierarztl Prax Ausg G Grosstiere Nutztiere. 2011;39(6):373-83. German. PubMed PMID: 22167082.
176. Hraha TH, Doremus KM, McIlwraith CW, Frisbie DD. (2011) Autologous conditioned serum: the comparative cytokine profiles of two commercial methods (IRAP and IRAP II) using equine blood. Equine Vet J. 2011 Sep;43(5):516-21. doi: 10.1111/j.2042-3306.2010.00321.x. Epub 2011 Mar 11. PubMed PMID: 21496084.
177. Darabos N, Haspl M, Moser C, Darabos A, Bartolek D, Groenemeyer D. (2011) Intraarticular application of autologous conditioned serum (ACS) reduces bone tunnel widening after ACL reconstructive surgery in a randomized controlled trial. Knee Surg Sports Traumatol Arthrosc. 2011 Dec;19 Suppl 1:S36-46. doi: 10.1007/s00167-011-1458-4. Epub 2011 Mar 1. PubMed PMID: 21360125.
178. Textor J. (2011) Autologous biologic treatment for equine musculoskeletal injuries: platelet-rich plasma and IL-1 receptor antagonist protein. Vet Clin North Am Equine Pract. 2011 Aug;27(2):275-98. doi: 10.1016/j.cveq.2011.05.001. PubMed PMID: 21872759.
179. Moser C, Groenemeyer DD, Becker J, Hartmann J, Wehling P. 464 Intradiscal Injections Of Orthokine-Derived Autologous Conditioned Serum (ACS) For Lumbar Disc Degeneration. Osteoarthr Cartil. 2011 Sep;19:S215.
180. Fortier LA, Barker JU, Strauss EJ, McCarrel TM, Cole BJ. (2011) The role of growth factors in cartilage repair. Clin Orthop Relat Res. 2011 Oct;469(10):2706-15. doi: 10.1007/s11999-011-1857-3. PubMed PMID: 21403984.

2010

181. Aurelie M. Treatment Of Articular Equine Disorders By Irap. Retrospective Study Of 28 Cases. University CRETEIL; 2010.
182. Fox BA, Stephens MM. (2010) Treatment of knee osteoarthritis with Orthokine-derived autologous conditioned serum. *Expert Rev Clin Immunol.* 2010 May;6(3):335-45. doi: 10.1586/eci.10.17. PubMed PMID: 20441419.
183. Rutgers M, Saris DB, Dhert WJ, Creemers LB. (2010) Cytokine profile of autologous conditioned serum for treatment of osteoarthritis, in vitro effects on cartilage metabolism and intra-articular levels after injection. *Arthritis Res Ther.* 2010;12(3):R114. doi: 10.1186/ar3050. Epub 2010 Jun 10. PubMed PMID: 20537160.
184. Moser C. Response to: cytokine profile of autologous conditioned serum for treatment of osteoarthritis, in vitro effects on cartilage metabolism and intra-articular levels after injection. *Arthritis Res Ther.* 2010;12(6):410; author reply 411. doi: 10.1186/ar3146. Epub 2010 Dec 17. PubMed PMID: 21205281.
185. Moser C, Groenemeyer D, Wehling P. Efficacy Of Epidural Injections With Autologous Conditioned Serum (ACS) For Lumbar Radicular Compression. *Eur Spine J.* 2010 19: 1395-1412.
186. Moser C, Groenemeyer D, Paduch T, Becker J, Wehling P. Intradiscal Injections Of Autologous Conditioned Serum (ACS) For Lumbar Disc Pain. *Eur Spine J.* 2010 19: 1395-1412.
187. Jöstingmeier U, Reinecke J, Hertsch B. Comparative Examination Of The Treatment Success Of Intra Articular Injection Combining Sodium Hyaluronate And Betamethason Vs Intra-Articular Injection With Autologous Conditioned Serum (IL-1Ra) In Horses Positive For Coffin Joint Anaesthesia. An Observational Study. *Equine Veterinarians Australia, EVA.* 2010. p. 1–20.
188. K.Yu. Shirokova, M.V. Zhomova. Viscosity Of Synovial Fluid Of Patients With Gonarthrosis In The Treatment Of Derivatives Of Autolog[ous conditioned serum]. 6th Int Pirogov Sci Med Congr students young Sci. 2011. p. 27.

2009

189. Baltzer AW, Moser C, Jansen SA, Krauspe R. (2009) Autologous conditioned serum (Orthokine) is an effective treatment for knee osteoarthritis. *Osteoarthritis Cartilage*. 2009 Feb;17(2):152-60. doi: 10.1016/j.joca.2008.06.014. Epub 2008 Jul 31. PubMed PMID: 18674932.
190. Darabos N, Hundric-Haspl Z, Haspl M, Markotic A, Darabos A, Moser C. (2009) Correlation between synovial fluid and serum IL-1beta levels after ACL surgery-preliminary report. *Int Orthop*. 2009 Apr;33(2):413-8. doi: 10.1007/s00264-008-0649-1. Epub 2008 Aug 27. PubMed PMID: 18751702.
191. Darabos N. [Einfluss von Interleukin 1 zur Erweiterung des Knochentunnels nach der operativen Rekonstruktion der Kreuzbänder des Kniegelenks.] *Utjecaj interleukina 1 na proširenje koštanog tunela nakon operacijske rekonstrukcije prednje ukrižene sveze koljenog zgloba*. University of Zagreb Medical School Repository; 2009.
192. Majewski M, Ochsner PE, Liu F, Flückiger R, Evans CH. (2009) Accelerated healing of the rat Achilles tendon in response to autologous conditioned serum. *Am J Sports Med*. 2009 Nov;37(11):2117-25. doi: 10.1177/0363546509348047. PubMed PMID: 19875360.
193. Wehling P, Carsten Moser, Reinecke JA. Use of Autologous Conditioned Cell-free Serum (Orthokine®) in Treating Osteoarthritis and Sciatic Back Pain. *Eur Musculoskelet Rev*. 2009 Mar 1;105(1):169–184.

2008

194. Weinberger T. Klinische Erfahrungen mit der Anwendung von ACS/ORTHOKIN/IRAP beim Pferd. *pferdespiegel* 3/2008. 2008;
195. Österdahl J. Evaluation of autologous conditioned serum *Utvärdering av autologt konditionerat serum*. University Uppsala 2008.

196. Creaney L, Hamilton B. Growth factor delivery methods in the management of sports injuries: the state of play. *Br J Sports Med*. 2008 May;42(5):314–20. PMID: 17984193,
197. Auw Yang KG, Raijmakers NJ, van Arkel ER, Caron JJ, Rijk PC, Willems WJ, Zijl JA, Verbout AJ, Dhert WJ, Saris DB. (2008) Autologous interleukin-1 receptor antagonist improves function and symptoms in osteoarthritis when compared to placebo in a prospective randomized controlled trial. *Osteoarthritis Cartilage*. 2008 Apr;16(4):498-505. Epub 2007 Sep 6. PubMed PMID: 17825587.
198. Müller N. Epidural perineurale Injektion mit Interleukin-1-Rezeptor-Antagonisten-Protein zur Behandlung des lumbalen Nervenwurzelkompressionsyndromes. Inaugural-Dissertation zur Erlangung des Doktorgrades der Medizin einer Hohen Medizinischen Fakultät der Ruhr-Universität Bochum. Ruhr-Universität Bochum; 2008.
199. Jöstingmeier U: Vergleichende Betrachtung des Behandlungserfolges der intraartikulären kombinierten Behandlung mit Natriumhyaluronat und Betamethason mit der intraartikulären Behandlung mit autologem konditionierten Serum (IL-1Ra) bei Pferden mit positiver Hufgelenksanästhesie - Eine Anwendungsbeobachtung. Inaugural-Dissertation an der Freien Universität Berlin (2008) ISBN 978-3- 86664-665-0.
200. Wu W, Needleman R, Drachuk A, Martinelli MJ. Biochemical Characterization and Clinical Assessment of Autologous Conditioned Serum. Poster No 673 • 54th Annu Meet ORS. 2007. p. 2007. *Annual Meeting of the Orthopaedic Research Society* (2008), San Francisco, USA.
201. Weinberger T. Clinical experience with ACS / Orthokine / IRAP in horses. *Equine Sport Med*. 3/2008
202. Weinberger T. Regenerative Therapiemöglichkeiten beim Pferd – eine Übersicht. *pferde spiegel* 3/2008
203. Wolf F, Haug M, Farhadi J, Candrian C, Martin I, Barbero A. A low percentage of autologous serum can replace bovine serum to engineer human nasal cartilage. *Eur Cell Mater*. 2008 Feb 5;15:1-10. doi: 10.22203/ecm.v015a01. PMID: 18247273.

204. Frisbie DD, Kawcak CE, Werpy NM, Park RD, McIlwraith CW. (2007) Clinical, biochemical, and histologic effects of intra-articular administration of autologous conditioned serum in horses with experimentally induced osteoarthritis. *Am J Vet Res*. 2007 Mar;68(3):290-6. PubMed PMID: 17331019.

205. Brossi PM. Evaluation of the anti-inflammatory effects of the interleukin-1 receptor antagonist protein in equine synovial fluid using flow cytometric techniques. *Avaliação dos efeitos antiinflamatórios da proteína antagonista de receptor de interleucina - 1 (IRAP)* p. Faculdade de Medicina Veterinária e Zootecnia. 2007.

206. Becker C, Heidersdorf S, Drewlo S, de Rodriguez SZ, Krämer J, Willburger RE. (2007) Efficacy of epidural perineural injections with autologous conditioned serum for lumbar radicular compression: an investigator-initiated, prospective, double-blind, reference-controlled study. *Spine (Phila Pa 1976)*. 2007 Aug 1;32(17):1803-8. Erratum in: *Spine*. 2007 Nov 15;32(24):table of contents. Dosage error in article text. PubMed PMID: 17762286.

207. Wehling P, Moser C, Frisbie D, McIlwraith CW, Kawcak CE, Krauspe R, Reinecke JA. (2007) Autologous conditioned serum in the treatment of orthopedic diseases: the orthokine therapy. *BioDrugs*. 2007;21(5):323-32. PubMed PMID: 17896838.

2006

208. Atassi M. Autologous IL-1Ra for treatment of advance knee joints osteoarthritis: first Middle East Study. *APLAR J Rheumatol* 2006. 2006;9:258.

209. Glawe H. Orthokin-Therapie an der Wirbelsäule. Eine Anwendungsbeobachtung an 261 Patienten. *Orthopäden Kongress*. 2006.

210. Theodoridis T, Krämer J. Interleukin-1 Rezeptor-Antagonist-Protein (IRAP). Injektionstherapie an der Wirbelsäule Man und Atlas. Thieme; 2006. p. 1–7.

2005

211. Carpenter TW. New Approaches for the Treatment of Muscle Injuries. *Deutsche Sporthochschule Köln*; 2005.

212. Evans CH. (2005) Novel biological approaches to the intra-articular treatment of osteoarthritis. *BioDrugs*. 2005;19(6):355-62. PubMed PMID: 16392888.

213. Levy E, Tornell J, Weinberger T, Koene M. Ein neuer biotechnologischer Weg? Intraartikuläre Behandlung mit autologem IRAP® conditionierten Serum - Teil 1. *pferde spiegel* 3/2005. 2005;1–5.

214. Hague BA. Clinical Impression Of Orthokine (Irap) Treating Joint Disease In The Performance Horse. *ACVS Congr*. 2005.

2004

215. Wright-Carpenter T, Opolon P, Appell HJ, Meijer H, Wehling P, Mir LM. (2004) Treatment of muscle injuries by local administration of autologous conditioned serum: animal experiments using a muscle contusion model. *Int J Sports Med*. 2004 Nov;25(8):582-7. PubMed PMID: 15532000.

216. Wright-Carpenter T, Klein P, Schäferhoff P, Appell HJ, Mir LM, Wehling P. (2004) Treatment of muscle injuries by local administration of autologous conditioned serum: a pilot study on sportsmen with muscle strains. *Int J Sports Med*. 2004 Nov;25(8):588-93. PubMed PMID: 15532001.

2003

217. Meijer H, Reinecke J, Becker C, Tholen G, Wehling P. (2003) The production of anti-inflammatory cytokines in whole blood by physico-chemical induction. *Inflamm Res*. 2003 Oct;52(10):404-7. PubMed PMID: 14520515.

218. Baltzer AWA, Drever R, Granrath M, Godde G, Klein W, Wehling P. Intraartikuläre Therapie der Gonarthrose mit autologem Interleukin-1 Rezeptor Antagonisten (IL-1Ra). [Intraarticular treatment of osteoarthritis using autologous interleukin-1 receptor antagonist (IL-1Ra) conditioned serum] *Dtsch Z Sportmed*. 2003;54(6):209–211.

1999

219. Reinecke J, Koch H, Meijer H, Granrath M, Schultz KP, Wehling P. Current status of gene therapy for rheumatoid arthritis. *BioDrugs*. 1999 Feb;11(2):103–14. PMID: 18031119

1998

220. Wehling P, Reinecke J, Meijer H. Epidural Injections with Interleukin-1 Receptor Antagonist (IL-1Ra) in Lumbar Radicular Compression: Pathophysiological Background, Safety and Clinical Results. *Spine (Phila Pa 1976)*. p. 5–6. International Society for the Study of the Lumbar Spine Congress 1998.

1995

221. Andersen LS, Petersen J, Svenson M, Bendtzen K. IgG for intravenous use, autologous serum and plasma induce comparable interleukin-1 receptor antagonist liberation from human mononuclear cells: an in vitro phenomenon depending upon plastic adherence. *Autoimmunity*. 1995;22(2):127-33. PubMed PMID: 8722583.