

Arthroscopy's Third Annual Musculoskeletal Biologics Special Issue Highlights Orthobiologics Having Current Impact and Future Promise



Abstract: *Arthroscopy's* Third Annual Musculoskeletal Biologics Special Issue delivers the most nascent scientific research and techniques from selected top publications and authors. These articles, published in our family of journals, feature a mix of infographics, basic science, clinical research, systematic reviews and meta-analyses, and technical notes with video content. We congratulate the selected authors for their inclusion in this Special Issue and continue the Call for Papers to promote and publish orthobiologic research in musculoskeletal medicine.

A *Arthroscopy* introduces its Third Annual Musculoskeletal Biologics Special Issue, https://www.arthroscopyjournal.org/biologics_vsi_2025, which again delivers the most nascent scientific research and techniques from selected, top publications and authors. This online compendium of orthobiologic publications has been compiled by Special Issue Guest Editor Brian Cole, M.D., and his team, Jared P. Sachs, M.S., and Yusuf N. Mufti, B.S.,¹ and follows two successful Annual Special Issues,²⁻⁵ https://www.arthroscopyjournal.org/biologics_vsi_2024 and https://www.arthroscopyjournal.org/biologics_vsi_2023. As Dr. Cole and his team state, “this issue underscores a commitment to high-quality research and further solidifies its role as a vital reference for orthopaedic professionals in this rapidly evolving area.”¹

These articles⁶⁻²⁰ published in our family of journals—*Arthroscopy*; *Arthroscopy, Sports Medicine, and Rehabilitation*; and *Arthroscopy Techniques*—feature a mix of infographics, basic science, clinical research, systematic reviews and meta-analyses, and technical notes with video content (Table 1). The authors cover the impact of orthobiologics on symptom management, healing, and repair of cartilage, meniscus, ligament, rotator cuff, and osteoarthritis (OA) involving the knee, hip, and shoulder with implications for other joints. The reports study potential blood-derived components and pluripotential cells derived from various sources, including plasma; adipose tissue; bone marrow; and umbilical, placental or amniotic origins.

Some of the conclusions reached by these authors after adding plasma or cellular treatment to the musculoskeletal milieu include the following:

- Basic science
 - adipose-derived stem cell sheets improve tensile strength and load distribution function in meniscus tears⁷;
 - adipose-derived stem cell sheets promote meniscus regeneration in meniscus defects⁸; and
 - decellularized bovine pericardial patch loaded with mesenchymal stromal cells increases mechanical strength and histologic healing after rotator cuff repair.⁹
- Clinical research
 - bone marrow–derived fibrin clot yields low clinical and anatomic failure rate after meniscal repair¹⁰;
 - adipose-derived stromal vascular fractions improve clinical and radiologic outcome after cartilage restoration and high tibial osteotomy¹¹;
 - amniotic suspension allograft improves pain and outcome after injection for moderate hip OA¹²;
 - platelet-rich plasma (PRP) shows significant variability in concentration on the basis of age and baseline platelet count¹³; and
 - optimal scaffold is yet to be determined but biologic enhancement of anterior cruciate ligament reconstruction or repair is promising.¹⁴
- Systematic review and meta-analysis
 - PRP augmentation yields lower failure rate in meniscus repair¹⁵;
 - PRP, bone marrow aspirate concentrate, and hyaluronic acid injections reduce pain and increase functional outcome via injection for knee OA¹⁶;
 - placenta-derived product injection shows good safety profile and satisfactory outcomes for knee OA¹⁷; and
 - PRP provides prolonged pain relief after injection for knee OA.¹⁸

Table 1. The Third Annual *Arthroscopy* Musculoskeletal Special Issue: Table of Contents

	Article Title	Authors
Infographics	Surgical applications for bone marrow aspirate concentrate ⁶	Lee JS, Gillinov SM, Siddiq BS, Dowley KS, Martin SD.
Basic Science	Regeneration using adipose-derived stem cell sheets in a rabbit meniscal defect model improves tensile strength and load distribution function of the meniscus at 12 weeks ⁷	Kimura M, Nakase J, Takata Y, Shimozaki K, Asai K, Yoshimizu R, Kanayama T, Yanatori Y, Tsuchiya H.
	Adipose-derived stem cell sheets promote meniscus regeneration regardless of whether the defect involves the inner half or the whole width of the anterior half of the medial meniscus in a rabbit model ⁸	Asai K, Nakase J, Yoshioka K, Yoshimizu R, Kimura M, Tsuchiya H.
	Decellularized bovine pericardial patch loaded with mesenchymal stromal cells enhance the mechanical strength and biological healing of large-to-massive rotator cuff tear in a rat model ⁹	Shim IK, Kang MS, Lee ES, Choi JH, Lee YN, Koh KH.
Clinical research	Biochemical characteristics and clinical result of bone marrow–derived fibrin clot for repair of isolated meniscal injury in the avascular zone ¹⁰	Hashimoto Y, Nishino K, Orita K, Yamasaki S, Nishida Y, Kinoshita T, Nakamura H.
	Adipose-derived stromal vascular fractions are comparable with allogenic human umbilical cord blood–derived mesenchymal stem cells as a supplementary strategy of high tibial osteotomy for varus knee osteoarthritis ¹¹	Kim YS, Suh DS, Tak DH, Kwon YB, Koh YG.
	A single injection of amniotic suspension allograft is safe and effective for treatment of mild to moderate hip osteoarthritis: A prospective study ¹²	Meadows MC, Elisman K, Nho SJ, Mowry K, Safran MR.
	Substantial variability in platelet-rich plasma composition is based on patient age and baseline platelet count ¹³	Rossi L, Ranalletta M, Pasqualini I, Zicaro JP, Paz MC, Camino P, Piuze NS.
	Biologics, stem cells, growth factors, platelet-rich plasma, hemarthrosis, and scaffolds may enhance anterior cruciate ligament surgical treatment ¹⁴	Sinkler MA, Furdock RJ, McMellen CJ, Calcei JG, Voos JE.
	Systematic reviews and meta-analyses	The use of platelet-rich plasma augmentation in meniscus repair results in a lower failure rate than in the control group: A systematic review from meta-analysis ¹⁵
Platelet-rich plasma, bone marrow aspirate concentrate, and hyaluronic acid injections outperform corticosteroids in pain and function scores at a minimum of 6 months as intra-articular injections for knee osteoarthritis: A systematic review and network meta-analysis ¹⁶		Jawanda H, Khan ZA, Warriar AA, Acuña AJ, Allahabadi S, Kaplan DJ, Ritz E, Jackson GR, Mameri ES, Batra A, Dornan G, Westrick J, Verma NN, Chahla J.
Placenta-derived products demonstrate good safety profile and overall satisfactory outcomes for treating knee osteoarthritis: A systematic review of clinical evidence ¹⁷		Di Matteo B, Anzillotti G, Gallese A, Vitale U, Gaggia GMMC, Ronzoni FL, Marcacci M, Kon E.
Estimated time to maximum medical improvement of intra-articular injections in the treatment of knee osteoarthritis: A systematic review ¹⁸		Mojica ES, Markus DH, Hurley ET, Blaeser AM, Jazrawi LM, Campbell KA, Strauss EJ.
Technical notes with video		Microfragmented adipose tissue associated with collagen membrane in the treatment of focal knee cartilage defect ¹⁹
	Revision meniscal repair with amniotic membrane augmentation ²⁰	Feeley SM, Feldman MW, McCarthy CF, Colantonio DF, Tokish JM, Tucker CJ.

Call for Papers on orthopaedic biologics for submission to *Arthroscopy*; *Arthroscopy Techniques*; and *Arthroscopy, Sports Medicine, and Rehabilitation*

• *Arthroscopy*; *Arthroscopy Techniques*; and *Arthroscopy, Sports Medicine, and Rehabilitation* wish to become “your home” for clinical musculoskeletal biologics research.

• We invite all authors to submit your clinical musculoskeletal biologics original scientific research, and technical notes with video, for peer review, consideration for publication, and possible selection for inclusion in upcoming orthopaedic biologics special issues.

• We look forward to peer reviewing your clinical musculoskeletal biologics submissions.

• Submit your biologic paper: <https://www.editorialmanager.com/arth>

Fig 1. Call for papers.

We urge our readers and researchers to access each of these articles to examine the precise cellular or plasma composition studied and the extent of impact. We encourage reviewing one of our featured infographics on the surgical applications of bone marrow aspirate concentrate⁶ available in the *Arthroscopy* Journal Infographics Library, <https://www.arthroscopyjournal.org/infographics>. In addition, two *Arthroscopy Techniques* videos,^{19,20} which describe specific orthobiologic delivery techniques of the use of microfragmented adipose tissue and amniotic membrane as augmentation for knee cartilage restoration and meniscus repair, respectively, are available.

We remind authors, researchers, and readers to adhere to regulations regarding the use and application of biologics in clinical and research realms as directed by their individual countries and specifically by the United States from the U.S. Food & Drug Administration.²¹

We congratulate the selected authors on their inclusion in this Third Annual Musculoskeletal Biologics Special Issue. We continue the Call for Papers (Fig 1) to press forward in our charge to promote “high-impact research, innovative clinical practice, and cutting-edge technologies in arthroscopic surgery, sports medicine, rehabilitation, and related fields to advance high-quality patient care.”²²

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Elizabeth Matzkin, M.D.
Deputy Editor

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**Orthopaedic Musculoskeletal Biologics Research Impacts Patient Care:
The Third Annual *Arthroscopy: The Journal of Arthroscopic and Related
Surgery Orthobiologics Virtual Special Issue***



Abstract: Orthobiologics represent a rapidly advancing field of research in musculoskeletal care, providing novel therapies to modify symptoms and potentially augment tissue regeneration when used in the clinical or operative setting. These treatments are derived from autologous cells, tissues, and blood components, yielding bioactive elements that may promote healing, reduce symptoms, and be associated with improved patient outcomes. Biologic therapies such as platelet-rich plasma, bone marrow aspirate concentrate, adipose-derived products, and amniotic allograft tissues have demonstrated favorable clinical outcomes. *Arthroscopy: The Journal of Arthroscopic and Related Surgery* and its companion journals are committed to advancing the field by publishing high-quality, peer-reviewed orthobiologics research. This anthology of articles showcases significant recent advancements in musculoskeletal orthobiologics research.

Orthobiologics continue to advance as a critical component of musculoskeletal care, offering innovative therapies to enhance tissue repair and support biological healing. These treatments, sourced autologously from patient cells, tissues, blood-derived components, and growth factors, offer valuable support in advancing the management of orthopaedic injuries and musculoskeletal conditions. Commonly used modalities, including platelet-rich plasma, bone marrow aspirate concentrate, adipose-derived products,

and amniotic allograft tissues show promise in both surgical and nonsurgical applications. Ongoing research has broadened their application across a wide range of conditions, including osteoarthritis, rotator cuff injuries, ligament reconstruction, and meniscal pathology, with the aim of not only relieving symptoms but also addressing the underlying pathology.

This Third Annual Orthobiologics Virtual Special Issue, presented by *Arthroscopy: The Journal of Arthroscopic and Related Surgery* and the family of journals, continues to highlight the most significant advancements in this rapidly growing field. Released in conjunction with the Arthroscopy Association of North America Annual Meeting and the Biologic Association