




## Stuart Goodman, MD, PhD

The Robert L. and Mary Ellenburg Professor of Surgery and Professor, by courtesy, of Bioengineering

Orthopaedic Surgery

 NIH Biosketch available Online

 Resume available Online

### CLINICAL OFFICE (PRIMARY)

- **Joint Replacement Center**

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### ACADEMIC CONTACT INFORMATION

- **Alternate Contact**

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### Bio

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#### BIO

Brief Biography: Stuart B. Goodman MD MSc PhD FRCSC FACS FBSE

Stuart B. Goodman is the Robert L. and Mary Ellenburg Professor of Surgery, and Professor with Tenure in the Department of Orthopaedic Surgery at Stanford University. He has a courtesy appointment in the Department of Bioengineering, and is a Fellow of the Institute of Chemistry, Engineering and Medicine for Human Health (ChEM-H) at Stanford University. He was Chief of Orthopaedic Surgery at Stanford University from 1994-2002. Dr. Goodman received his BSc, MD and MSc (Institute of Medical Science) from the University of Toronto, and his PhD in Orthopedic Medical Science from Lund University in Sweden. He is a Fellow of the Royal College of Surgeons (Canada), the American Academy of Orthopaedic Surgeons and the American College of Surgeons. Dr. Goodman's clinical practice concentrates on adult reconstructive surgery. His clinical research interests center on the outcome of surgery for arthritis including primary and revision total joint replacement, juvenile arthritis, and osteonecrosis of the hip and knee. His basic science interests center on biocompatibility of orthopaedic implants, inflammation, and musculoskeletal tissue regeneration and repair. Dr. Goodman is/has been a member of numerous academic organizations including the AAOS Biological Implants Committee (Chairman), and is a former member of the AAOS Biomedical Engineering Committee. He is a member of the Hip Society, Knee Society and AAHKS, a consultant to the Orthopaedic and Rehabilitation Devices Advisory Panel of the FDA, and former vice-chairman of the Musculoskeletal Tissue Engineering study section at NIH. Dr. Goodman is on the editorial board of the Journal of Orthopaedic Research (Associate Editor), Clinical Orthopaedics (Associate Editor), Biomaterials (Associate Editor), Journal of Arthroplasty, Journal of Biomedical Materials Research, and other journals, and is a manuscript reviewer for over 30 journals in the fields of orthopaedic surgery, arthritis, bioengineering and biomaterials. Dr. Goodman has published over 500 peer-reviewed manuscripts in medical and bioengineering journals. Dr. Goodman and co-workers have received awards for their research from the Society for Biomaterials, Orthopaedic Research Society, the American Orthopaedic Association, Western Orthopaedic Association, and the Association of Bone and Joint Surgeons. Dr. Goodman was awarded the Clemson Award for Basic Research from the Society For Biomaterials in May 2000. He was the President of the Society For Biomaterials (2001-2) and served on the Board of Directors of the Orthopaedic Research Society. Dr. Goodman served as Co-Chair for the 1995, 2000 and 2007 NIH/AAOS-sponsored workshops on Implant Wear. Dr. Goodman was recognized as a Fellow, Biomaterials Science and Engineering (FBSE) by the International Union of Societies, Biomaterials Science and Engineering in May 2004, a Fellow of the Japanese Society of the Promotion of Science in 2011, and a Fellow of the American Institute of Medical and Biological Engineers in 2012.

Dr. Goodman serves as a consultant for several companies including Hyalex., Accelalox, Pluristem, and Wishbone Medical.

## **CLINICAL FOCUS**

- Adult Reconstruction- Lower Extremity
- Osteonecrosis - hip and knee
- primary and revision hip and knee replacement
- Juvenile arthritis - surgery of the lower extremity
- Adult Reconstructive Orthopedic Surgery

## **ACADEMIC APPOINTMENTS**

- Professor, Orthopaedic Surgery
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Faculty Fellow, Sarafan ChEM-H

## **ADMINISTRATIVE APPOINTMENTS**

- Fellow, Institute for Chemistry, Engineering and Medicine for Human Health (ChEM-H), Stanford University, (2014- present)
- Professor (by courtesy), Department of Bioengineering, Stanford University, (2011- present)
- Fellowship Director, Orthopaedic Adult Reconstruction, Stanford University, (2008- present)
- Robert and Mary Ellenburg Professor of Surgery, Stanford University, (2006- present)
- Affiliated Faculty – Stanford Center on Longevity, Stanford University, (2005- present)
- Professor, Orthopaedic Surgery, Stanford University, (2002- present)
- Associated Faculty - Biomechanical Engineering Program, Mechanical Engineering Department, Stanford University, (1990- present)

## **HONORS AND AWARDS**

- Patriotic Employer Award, Employer Support of the Guard and Reserve (ESGR), Department of Defense (2018)
- Fellow, International Combined Orthopaedic Research Societies (2016)
- Fellow, American Institute of Medical and Biological Engineers (2012)
- Fellow, Japan Society for the Promotion of Science (2011)
- Saul Halpern M.D. Orthopaedic Educator Award, Department of Orthopaedic Surgery, Stanford University (2007)
- Fellow, Biomaterials Science and Engineering (FBSE), International Union of Societies, Biomaterials Science and Engineering (2004)
- Clemson Award for Basic Research, Society For Biomaterials., Society For Biomaterials (2000)
- America's Top Surgeons, America's Top Surgeons (2016-2020)
- Patient's Choice Award, Patient's Choice Award (2012-2015, 2020)
- Compassionate Doctor Award, Compassionate Doctor Award (2015, 2020)
- America's Most Honored Professionals, America's Most Honored Professionals (2016-2020)
- America's Top Doctors, America's Top Doctors (2000-2020)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- Fellow, Fellow Royal College of Physicians & Surgeons (Canada) (1984 - present)
- Fellow, American College of Surgeons (1988 - present)
- Fellow, American Academy of Orthopaedic Surgeons (1987 - present)

## PROFESSIONAL EDUCATION

- Residency: University of Toronto (1984)
- Medical Education: University of Toronto (1978) Canada
- Internship: Toronto General Hospital Postgraduate Education (1979) Canada
- Board Certification: Orthopaedic Surgery, American Board of Orthopaedic Surgery (1987)
- Fellowship: Sunnybrook Medical Center (1985) Canada
- Fellowship: Wellesley Hospital (1985) Canada

## LINKS

- Get a Second Opinion: <https://stanfordhealthcare.org/second-opinion/overview.html>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

As an academic orthopaedic surgeon, my interests center on adult reconstructive surgery including total joint replacement, osteotomies and the fixation of fractures. Both clinical and basic science investigations are ongoing.

My specific research interests include the following:

1. the biological aspects of the interface between orthopaedic implants/biomaterials and bone
2. the innate immune system and macrophages
3. tissue engineering and mesenchymal tissue differentiation
4. total joint replacement: prosthesis design, biomechanics, biomaterials, mechanisms of failure, imaging etc
5. arthritis: etiology, diagnosis, imaging, treatment, outcomes
6. osteonecrosis

### CLINICAL TRIALS

- Use of PET/MR Imaging in Chronic Pain, Not Recruiting

### PROJECTS

- Customized MSCs to Enhance Healing of Bone Defects - Stanford University
- Enhanced Bone Healing Around Implants by Transplanted NF- $\kappa$ B Driven Immunomodulating MSCs - Orthopaedic Research Laboratories, Stanford University
- Tissue Engineering Approaches for Improved Treatment of Early Stage Osteonecrosis of the Hip - Orthopaedic Research Laboratories, Stanford University
- Tissue Chip Modeling of Synovial Joint Pathologies: Effects of Inflammation and Adipose Mediated Diabetic Complications - Orthopaedic Research Laboratories, Stanford University
- Cell-Based Autogenous Grafting for the Treatment of Femoral Head Osteonecrosis - Orthopaedic Research Laboratories, Stanford University

## Teaching

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### STANFORD ADVISEES

#### Med Scholar Project Advisor

Max Lee

#### Doctoral Dissertation Reader (AC)

Cassandra Villicana

#### Postdoctoral Faculty Sponsor

Qi Gao, Yosuke Susuki

#### Postdoctoral Research Mentor

Qi Gao

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Adult Reconstruction (Fellowship Program)
- Bioengineering (Phd Program)

## Publications

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### PUBLICATIONS

- **The outcome of revision total hip arthroplasty for instability.** *The bone & joint journal*  
Apinyankul, R., Hong, C., Hwang, K. L., Burket Koltsov, J. C., Amanatullah, D. F., Huddleston, J. I., Maloney, W. J., Goodman, S. B.  
2024; 106-B (5 Supple B): 105-111
- **Correction: Pius et al. Effects of Aging on Osteosynthesis at Bone-Implant Interfaces.** *Biomolecules* 2024, 14, 52. *Biomolecules*  
Pius, A. K., Toya, M., Gao, Q., Lee, M. L., Ergul, Y. S., Chow, S. K., Goodman, S. B.  
2024; 14 (3)
- **Targeting an inflammation-amplifying cell population can attenuate osteoarthritis-associated pain.** *Arthritis research & therapy*  
Pandey, A., Singla, M., Geller, A., Goodman, S. B., Bhutani, N.  
2024; 26 (1): 53
- **Assessing Ability for ChatGPT to Answer Total Knee Arthroplasty-Related Questions.** *The Journal of arthroplasty*  
Magruder, M. L., Rodriguez, A., Wong, C. H., Erez, O., Piuuzzi, N. S., Scuderi, G. R., Slover, J., Oh, J. H., Schwarzkopf, R., Chen, A. F., Iorio, R., Goodman, S. B.,  
Mont, et al  
2024
- **Additively manufactured Ti-Ta-Cu alloys for the next-generation load-bearing implants.** *International journal of extreme manufacturing*  
Bandyopadhyay, A., Mitra, I., Ciliveri, S., Avila, J. D., Dernell, W., Goodman, S. B., Bose, S.  
2024; 6 (1): 015503
- **Sex differences of NF- $\kappa$ B-targeted therapy for mitigating osteoporosis associated with chronic inflammation of bone.** *Bone & joint research*  
Toya, M., Kushioka, J., Shen, H., Utsunomiya, T., Hirata, H., Tsubosaka, M., Gao, Q., Chow, S. K., Zhang, N., Goodman, S. B.  
2024; 13 (1): 28-39
- **Preclinical models for studying corticosteroid-induced osteonecrosis of the femoral head.** *Journal of biomedical materials research. Part B, Applied biomaterials*  
Tsubosaka, M., Maruyama, M., Lui, E., Kushioka, J., Toya, M., Gao, Q., Shen, H., Li, X., Chow, S. K., Zhang, N., Yang, Y. P., Goodman, S. B.  
2024; 112 (1): e35360
- **Preclinical models for studying corticosteroid-induced osteonecrosis of the femoral head** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART B-APPLIED BIOMATERIALS*  
Tsubosaka, M., Maruyama, M., Lui, E., Kushioka, J., Toya, M., Gao, Q., Shen, H., Li, X., Chow, S., Zhang, N., Yang, Y., Goodman, S. B.

2024; 112 (1)

- **Effects of Aging on Osteosynthesis at Bone-Implant Interfaces.** *Biomolecules*  
Pius, A. K., Toya, M., Gao, Q., Ergul, Y. S., Chow, S. K., Goodman, S. B.  
2023; 14 (1)
- **The 2023 Orthopaedic Research Society's International Consensus Meeting on musculoskeletal infection: Summary from the host immunity section.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*  
Schwarz, E. M., Archer, N. K., Atkins, G. J., Bentley, K. a., Botros, M., Cassat, J. E., Chisari, E., Coraça-Huber, D. C., Daiss, J. L., Gill, S. R., Goodman, S. B., Harro, J., Hernandez, et al  
2023
- **Primary Total Hip Arthroplasty in Juvenile Idiopathic Arthritis: Survivorship after a Median Follow-up of 12 Years.** *The Journal of arthroplasty*  
Warren, S. I., Hwang, K. L., Lee, J. J., Murrietta, A., Koltsov, J. C., Goodman, S. B.  
2023
- **Host and Microbial Characteristics Associated with Recurrent Prosthetic Joint Infections.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*  
Hampton, J. P., Zhou, J. Y., Kameni, F. N., Espiritu, J. R., Manasherob, R., Cheung, E., Miller, M. D., Huddleston, J. I., Maloney, W. J., Goodman, S. B., Amanatullah, D. F.  
2023
- **C-C Motif Chemokine Ligand 2 Enhances Macrophage Chemotaxis, Osteogenesis, and Angiogenesis during the Inflammatory Phase of Bone Regeneration.** *Biomolecules*  
Shinohara, I., Tsubosaka, M., Toya, M., Lee, M. L., Kushioka, J., Murayama, M., Gao, Q., Li, X., Zhang, N., Chow, S. K., Matsumoto, T., Kuroda, R., Goodman, et al  
2023; 13 (11)
- **Poly lactide Degradation Activates Immune Cells by Metabolic Reprogramming.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*  
Maduka, C. V., Alhaj, M., Ural, E., Habeeb, O. M., Kuhnert, M. M., Smith, K., Makela, A. V., Pope, H., Chen, S., Hix, J. M., Mallett, C. L., Chung, S., Hakun, et al  
2023: e2304632
- **Friend or foe? Inflammation and the foreign body response to orthopedic biomaterials.** *Journal of biomedical materials research. Part A*  
Gibon, E., Takakubo, Y., Zwingenberger, S., Gallo, J., Takagi, M., Goodman, S. B.  
2023
- **TET1 regulates skeletal stem cell (SSC) mediated cartilage regeneration.** *Arthritis & rheumatology (Hoboken, N.J.)*  
Pandey, A., Hoover, M., Singla, M., Bedi, Y., Storaci, H., Goodman, S. B., Chan, C., Bhutani, N.  
2023
- **Glycolytic reprogramming in macrophages and MSCs during inflammation.** *Frontiers in immunology*  
Li, X., Shen, H., Zhang, M., Teissier, V., Huang, E. E., Gao, Q., Tsubosaka, M., Toya, M., Kushioka, J., Maduka, C. V., Contag, C. H., Chow, S. K., Zhang, et al  
2023; 14: 1199751
- **Del1 Is a Growth Factor for Skeletal Progenitor Cells in the Fracture Callus.** *Biomolecules*  
Sun, Y., Boyko, T., Marecic, O., Struck, D., Mann, R. K., Andrew, T. W., Lopez, M., Tong, X., Goodman, S. B., Yang, F., Longaker, M. T., Chan, C. K., Yang, et al  
2023; 13 (8)
- **CCL2 promotes osteogenesis by facilitating macrophage migration during acute inflammation.** *Frontiers in cell and developmental biology*  
Toya, M., Zhang, N., Tsubosaka, M., Kushioka, J., Gao, Q., Li, X., Chow, S. K., Goodman, S. B.  
2023; 11: 1213641
- **Purification and functional characterization of novel human skeletal stem cell lineages.** *Nature protocols*  
Hoover, M. Y., Ambrosi, T. H., Steininger, H. M., Koepke, L. S., Wang, Y., Zhao, L., Murphy, M. P., Alam, A. A., Arouge, E. J., Butler, M. G., Takematsu, E., Stavitsky, S. P., Hu, et al  
2023
- **Glycolytic reprogramming underlies immune cell activation by polyethylene wear particles.** *Biomaterials advances*  
Maduka, C. V., Habeeb, O. M., Kuhnert, M. M., Hakun, M., Goodman, S. B., Contag, C. H.  
2023; 152: 213495

- **Bone regeneration in inflammation with aging and cell-based immunomodulatory therapy.** *Inflammation and regeneration*  
Kushioka, J., Chow, S. K., Toya, M., Tsubosaka, M., Shen, H., Gao, Q., Li, X., Zhang, N., Goodman, S. B.  
2023; 43 (1): 29
- **Bioenergetic Profile Of Mesenchymal Stromal Cells And Macrophages In The Presence Of An Inflammatory Stimulus In A 3D Model**  
Teissier, V., Gao, Q., Shen, H., Li, J., Li, X., Huang, E., Kushioka, J., Toya, M., Tsubosaka, M., Hirata, H., Alizadeh, H., Maduka, C., Zhang, et al  
MARY ANN LIEBERT, INC.2023
- **Selecting a High-dose Antibiotic-laden Cement Knee Spacer.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*  
Hollyer, I., Ivanov, D., Kappagoda, S., Lowenberg, D. W., Goodman, S. B., Amanatullah, D. F.  
2023
- **Sex Differences Of Nf- $\kappa$ B-targeted Therapy For Mitigating Chronic Inflammation In Bone**  
Toya, M., Kushioka, J., Shen, H., Utsunomiya, T., Huang, E., Hirata, H., Tsubosaka, M., Gao, Q., Teissier, V., Li, X., Zhang, N., Goodman, S. B.  
MARY ANN LIEBERT, INC.2023
- **Arthroplasty for femoral neck fractures is at risk for under restoration of lateral femoral offset.** *Hip international : the journal of clinical and experimental research on hip pathology and therapy*  
Shah, H. N., Barrett, A. A., Finlay, A. K., Arora, P., Bellino, M. J., Bishop, J. A., Gardner, M. J., Miller, M. D., Huddleston, J. I., Maloney, W. J., Goodman, S. B., Amanatullah, D. F.  
2023: 11207000231169914
- **Metabolic profile of mesenchymal stromal cells and macrophages in the presence of polyethylene particles in a 3D model.** *Stem cell research & therapy*  
Teissier, V., Gao, Q., Shen, H., Li, J., Li, X., Huang, E. E., Kushioka, J., Toya, M., Tsubosaka, M., Hirata, H., Alizadeh, H. V., Maduka, C. V., Contag, et al  
2023; 14 (1): 99
- **Assessment of Team Dynamics and Operative Efficiency in Hip and Knee Arthroplasty.** *JAMA surgery*  
Cousins, H. C., Cahan, E. M., Steere, J. T., Maloney, W. J., Goodman, S. B., Miller, M. D., Huddleston, J. I., Amanatullah, D. F.  
2023
- **Improving Biocompatibility for Next Generation of Metallic Implants.** *Progress in materials science*  
Bandyopadhyay, A., Mitra, I., Goodman, S. B., Kumar, M., Bose, S.  
2023; 133
- **Abrieb bei Metall-Metall-Gleitpaarungen : Was haben wir aus den letzten Jahrzehnten gelernt?** *Orthopadie (Heidelberg, Germany)*  
Knecht, C., Polakof, L., Behrens, J., Goodman, S. B.  
2023
- **Using Microphysiological System for the Development of Treatments for Joint Inflammation and Associated Cartilage Loss-A Pilot Study.** *Biomolecules*  
Makarczyk, M. J., Hines, S., Yagi, H., Li, Z. A., Aguglia, A. M., Zbikowski, J., Padget, A. M., Gao, Q., Bunnell, B. A., Goodman, S. B., Lin, H.  
2023; 13 (2)
- **Complications, Implant Survivorships, and Functional Outcomes of Conversion Total Knee Arthroplasty with Prior Hardware.** *The Journal of arthroplasty*  
Apinyankul, R., Hui, A. Y., Hwang, K., Segovia, N. A., Amanatullah, D. F., Huddleston, J. I., Maloney, W. J., Goodman, S. B.  
2023
- **Creation of a Knee Joint-on-a-Chip for Modeling Joint Diseases and Testing Drugs.** *Journal of visualized experiments : JoVE*  
Makarczyk, M. J., Li, Z. A., Yu, I., Yagi, H., Zhang, X., Yocum, L., Li, E., Fritch, M. R., Gao, Q., Bunnell, B. A., Goodman, S. B., Tuan, R. S., Alexander, et al  
2023
- **Stereochemistry Determines Immune Cellular Responses to Polylactide Implants.** *ACS biomaterials science & engineering*  
Maduka, C. V., Alhaj, M., Ural, E., Kuhnert, M. M., Habeeb, O. M., Schillmiller, A. L., Hankenson, K. D., Goodman, S. B., Narayan, R., Contag, C. H.  
2023
- **The efficiency of genetically modified mesenchymal stromal cells combined with a functionally graded scaffold for bone regeneration in corticosteroid-induced osteonecrosis of the femoral head in rabbits.** *Journal of biomedical materials research. Part A*  
Tsubosaka, M., Maruyama, M., Lui, E., Moeinzadeh, S., Huang, E. E., Kushioka, J., Hirata, H., Jain, C., Storaci, H. W., Chan, C., Toya, M., Gao, Q., Teissier, et al  
2023
- **MegaPro, a clinically translatable nanoparticle for in vivo tracking of stem cell implants in pig cartilage defects.** *Theranostics*

- Suryadevara, V., Hajipour, M. J., Adams, L. C., Aissaoui, N. M., Rashidi, A., Kiru, L., Theruvath, A. J., Huang, C., Maruyama, M., Tsubosaka, M., Lyons, J. K., Wu, W. E., Roudi, et al  
2023; 13 (8): 2710-2720
- **Clinical Assessments of Fracture Healing and Basic Science Correlates: Is There Room for Convergence?** *Current osteoporosis reports*  
Lopas, L. A., Shen, H., Zhang, N., Jang, Y., Tawfik, V. L., Goodman, S. B., Natoli, R. M.  
2022
  - **Revision hip arthroplasty using a modular, cementless femoral stem: long-term follow-up.** *The Journal of arthroplasty*  
Valtanen, R. S., Hwang, K. L., Amanatullah, D. F., Huddleston, J. I., Maloney, W. J., Goodman, S. B.  
2022
  - **Experimental models to study osteoarthritis pain and develop therapeutics.** *Osteoarthritis and cartilage open*  
Riewruja, K., Makarczyk, M., Alexander, P. G., Gao, Q., Goodman, S. B., Bunnell, B. A., Gold, M. S., Lin, H.  
2022; 4 (4): 100306
  - **The Environmental Impact of Orthopaedic Surgery.** *The Journal of bone and joint surgery. American volume*  
Saleh, J. R., Mitchell, A., Kha, S. T., Outterson, R., Choi, A., Allen, L., Chang, T., Ladd, A. L., Goodman, S. B., Fox, P., Chou, L.  
2022
  - **Sexually dimorphic estrogen sensing in skeletal stem cells controls skeletal regeneration.** *Nature communications*  
Andrew, T. W., Koepke, L. S., Wang, Y., Lopez, M., Steininger, H., Struck, D., Boyko, T., Ambrosi, T. H., Tong, X., Sun, Y., Gulati, G. S., Murphy, M. P., Marcic, et al  
2022; 13 (1): 6491
  - **Outcome of the Wagner Cone femoral component for difficult anatomical conditions during total hip arthroplasty.** *International orthopaedics*  
Lawson, K., Hwang, K. L., Montgomery, S., Amanatullah, D. F., Huddleston, J. I., Maloney, W. J., Goodman, S. B.  
2022
  - **Relationship of Aging, Inflammation, and Skeletal Stem Cells and Their Effects on Fracture Repair.** *Current osteoporosis reports*  
Goodnough, L. H., Goodman, S. B.  
2022
  - **Isolated Versus Full Component Revision In Total Knee Arthroplasty For Aseptic Loosening.** *The Journal of arthroplasty*  
Apinyankul, R., Hwang, K., Segovia, N. A., Amanatullah, D. F., Huddleston, J. I., Maloney, W. J., Goodman, S. B.  
2022
  - **The Impact of Extended Trochanteric Osteotomy with Cerclage Fixation in Revision Total Hip Arthroplasty for Prosthetic Joint Infection.** *The Journal of arthroplasty*  
Whittaker, M. J., Arora, P., Huddleston, J. I., Goodman, S. B., Maloney, W. J., Amanatullah, D. F.  
2022
  - **Differential dynamics of bone graft transplantation and mesenchymal stem cell therapy during bone defect healing in a murine critical size defect.** *Journal of orthopaedic translation*  
Huang, E. E., Zhang, N., Ganio, E. A., Shen, H., Li, X., Ueno, M., Utsunomiya, T., Maruyama, M., Gao, Q., Su, N., Yao, Z., Yang, F., Gaudilliere, et al  
2022; 36: 64-74
  - **A Physician Assistant Is Associated With Higher Patient Satisfaction With Outpatient Orthopedic Surgery** *ORTHOPEDICS*  
Korth, M., Lu, L. Y., Finlay, A. K., Kamal, R. N., Goodman, S. B., Maloney, W. J., Amanatullah, D. F., Huddleston, J. I.  
2022; 45 (5): E252-E256
  - **Therapeutic effects of MSCs, genetically modified MSCs, and NFκB-inhibitor on chronic inflammatory osteolysis in aged mice.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*  
Kushioka, J., Toya, M., Shen, H., Hirata, H., Zhang, N., Huang, E., Tsubosaka, M., Gao, Q., Teissier, V., Li, X., Utsunomiya, T., Goodman, S. B.  
2022
  - **Synovial joint-on-a-chip for modeling arthritis: progress, pitfalls, and potential.** *Trends in biotechnology*  
Li, Z. A., Sant, S., Cho, S. K., Goodman, S. B., Bunnell, B. A., Tuan, R. S., Gold, M. S., Lin, H.  
2022
  - **Facilitation Of Bone Defect Healing By IL-4 Over- expressing MSCs**

Goodman, S. B., Zhang, N., Ueno, M., Yang, F.  
MARY ANN LIEBERT, INC.2022: 80-81

- **Aberrant Expression of COX-2 and FOXG1 in Infrapatellar Fat Pad-Derived ASCs from Pre-Diabetic Donors.** *Cells*  
O'Donnell, B. T., Monjure, T. A., Al-Ghadban, S., Ives, C. J., L'Ecuyer, M. P., Rhee, C., Romero-Lopez, M., Li, Z., Goodman, S. B., Lin, H., Tuan, R. S., Bunnell, B. A.  
2022; 11 (15)
- **Effect of Perioperative Gabapentin on Postoperative Pain Resolution and Opioid Cessation in a Mixed Surgical Cohort: A Randomized Clinical Trial (vol 153, pg 303, 2018) JAMA SURGERY**  
Hah, J., Mackey, S. C., Schmidt, P.  
2022; 157 (6): 553
- **Efficacy of Periarticular Multimodal Analgesic Injection Containing High-Dose Ketorolac versus Triamcinolone in Early Postoperative Total Knee Arthroplasty: A Randomized Controlled Trial** *SURGICAL TECHNOLOGY INTERNATIONAL-INTERNATIONAL DEVELOPMENTS IN SURGERY AND SURGICAL RESEARCH*  
Apinyankul, R., Lilakhunakon, K., Vechvitvarakul, M., Witayakom, W., Goodman, S. B.  
2022; 40
- **Efficacy of Periarticular Multimodal Analgesic Injection Containing High-Dose Ketorolac versus Triamcinolone in Early Postoperative Total Knee Arthroplasty: A Randomized Controlled Trial.** *Surgical technology international*  
Apinyankul, R., Lilakhunakon, K., Witayakom, W., Vechvitvarakul, M., Goodman, S. B.  
2022; 40
- **Effect of Perioperative Gabapentin on Postoperative Pain Resolution and Opioid Cessation in a Mixed Surgical Cohort: A Randomized Clinical Trial (vol 153, pg 303, 2018) JAMA SURGERY**  
Hah, J., Mackey, S. C., Schmidt, P.  
2022
- **Human Mesenchymal Stem Cell-Derived Miniature Joint System for Disease Modeling and Drug Testing.** *Advanced science (Weinheim, Baden-Wuerttemberg, Germany)*  
Li, Z., Lin, Z., Liu, S., Yagi, H., Zhang, X., Yocum, L., Romero-Lopez, M., Rhee, C., Makarczyk, M. J., Yu, I., Li, E. N., Fritch, M. R., Gao, et al  
2022: e2105909
- **A Review of Biomimetic Topographies and Their Role in Promoting Bone Formation and Osseointegration: Implications for Clinical Use.** *Biomimetics (Basel, Switzerland)*  
Berger, M. B., Slosar, P., Schwartz, Z., Cohen, D. J., Goodman, S. B., Anderson, P. A., Boyan, B. D.  
2022; 7 (2)
- **Novel Techniques and Future Perspective for Investigating Critical-Size Bone Defects.** *Bioengineering (Basel, Switzerland)*  
Huang, E. E., Zhang, N., Shen, H., Li, X., Maruyama, M., Utsunomiya, T., Gao, Q., Guzman, R. A., Goodman, S. B.  
2022; 9 (4)
- **EFFICACY OF PRECONDITIONED OR GENETICALLY MODIFIED IL4-SECRETING MESENCHYMAL STROMAL CELLS IN A MODEL OF STEROID-ASSOCIATED OSTEONECROSIS OF THE FEMORAL HEAD IN RABBITS**  
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