

CURRICULUM VITAE

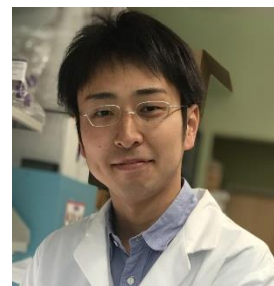
Hiroataka Iijima, PhD, PT

Personal:

Date of Birth: February 19, 1987

Place of Birth: Saitama, Japan

Hobby: watching movie and sports



Work Address:

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Current Position:

Overseas Research Fellowship, Japan Society for the Promotion of Science

Research Scholar, Department of Physical Medicine and Rehabilitation, University of Pittsburgh
(advisor: Dr. Fabrisia Ambrosio)

Visiting Researcher, Department of System Design Engineering, Faculty of Science and Technology,
Keio University (advisor: Dr. Masaki Takahashi)

Visiting Researcher, Department of Physical Therapy, Human Health Sciences, Graduate School of
Medicine, Kyoto University (advisor: Dr. Hiroshi Kuroki)

Education:

Ph.D. Human Health Science

Kyoto University, Japan, March, 2017

Thesis: *“Exercise intervention increases expression of bone morphogenetic proteins and prevents the progression of cartilage-subchondral bone lesions in a post-traumatic rat knee model”*

Advisor: Prof. Hiroshi Kuroki

MS.c. Human Health Science

Kyoto University, Japan, March, 2014

Thesis: *“Investigating weakness of knee cartilage covered by menisci and changes of cartilage and subchondral bone in early knee osteoarthritis”*

Advisor: Prof. Hiroshi Kuroki

B.S. Healthcare and Welfare

Saitama Prefectural University, Japan, March, 2009

Thesis: “*Effects of physical therapy modalities on musculoskeletal disease: a systematic review*”

Advisor: Prof. Kiyomi Takayanagi

2014–2017

Department of Physical Therapy, Graduate School of Medicine, Kyoto University, Kyoto, Japan
(Ph.D. Thesis) Advisor: Hiroshi Kuroki

2012–2014

Department of Physical Therapy, Graduate School of Medicine, Kyoto University, Kyoto, Japan
(MSc. Thesis) Advisor: Hiroshi Kuroki

2005–2009

Department of Physical Therapy, Saitama Prefectural University, Saitama, Japan
(B.S. Thesis) Advisor: Kiyomi Takayanagi

Positions and Honors:

Positions and Employment

2019–present Overseas Research Fellowship, Japan Society for the Promotion of Science, University of Pittsburgh, United State

2019–present Visiting Researcher, Keio University, Yokohama, Japan

2017–present Visiting Researcher, Kyoto University, Kyoto, Japan

2017–2019 Research Fellow of Japan Society for the Promotion of Science (PD), Keio University, Yokohama, Japan

2016–2017 Part-time Lecturer, Kyoto University, Kyoto, Japan

2015–2017 Research Fellow of Japan Society for the Promotion of Science (DC2), Kyoto University, Kyoto, Japan

2012–2015 Physical Therapist, Watatani Orthopaedic Clinic, Kyoto, Japan

2012–2015 Physical Therapist, Ito Clinic, Kyoto, Japan

2009–2012 Physical Therapist, Juntendo University Hospital, Chiba, Japan

Other Experience and Professional Memberships

2012–present Member, Osteoarthritis Research Society International

2012–present Member, The Japanese Society of Cartilage Metabolism

2009–present Member, The Japanese Physical Therapy Association

2018-2019 Member, The American Physiological Society

2018-2019 Member, The Japan Society of Mechanical Engineers

2018-2019 Member, The Society of Life Support Engineering

Honor

2021 Uehara Memorial Foundation Research Fellowship

2020 Highest Rated Abstracts from Young Investigators, OARSI World Congress on Osteoarthritis 2020

2019 Travel Award, 8th Annual International Symposium on Regenerative Rehabilitation

2018 Travel Scholarship, Japan Foundation for Aging and Health

2017 Best Graduate Student Award, Department of Physical Therapy, Graduate School of Medicine, Kyoto University

2017 Outstanding publication, The Japanese Society for Bone and Mineral Research

2016 Award for Outstanding Contribution in Reviewing - Osteoarthritis and Cartilage

2015 Outstanding Poster Presentation, Osteoarthritis Research Society International Young Investigator Committee, OARSI World Congress on Osteoarthritis 2015

2013 Best Presentation Award, First Research Symposium in Saitama Prefectural University

2012 Student Scholarship, Japan Student Services Organization

2009 Best Student Award, The Japanese Rehabilitation Association

2009 Best Bachelor Student Award, Department of Physical Therapy, Saitama Prefectural University

2005 Student Scholarship, Japan Student Services Organization

2003 Student Scholarship, Furuoka Scholarship Foundation

Research Interests:**Biological Response of Cartilage-Bone Unit to Physical Exercise**

My previous studies have provided mechanistic evidence that treadmill running improved cartilage and subchondral bone integrities through increased expression of bone morphogenetic protein (BMP) in a pre-clinical model of rat meniscus injury (awarded as *outstanding publication by the Japanese Society for Bone and Mineral Research*)¹⁻².

1. **Iijima H**, et al. Physiological exercise loading suppresses post-traumatic osteoarthritis progression via an increase in bone morphogenetic proteins expression in an experimental rat knee model. *Osteoarthritis Cartilage* 2017;25(6):964–75.
2. **Iijima H**, et al. Exercise intervention increases expression of bone morphogenetic proteins and prevents the progression of cartilage-subchondral bone lesions in a post-traumatic rat knee model. *Osteoarthritis Cartilage* 2016;24(6):1092–102.

Regenerative Rehabilitation for Knee Osteoarthritis

My researches also contributed to promote effective regenerative rehabilitation in knee osteoarthritis, as defined integration of approaches from cartilage-bone biology and rehabilitation

medicine, with the ultimate goal of developing innovative and effective diagnostic and therapeutic methods that promote the tissue regeneration and functional recovery. My previous work shed light on a potential role of rehabilitation to promote functional recovery after mesenchymal stem cell therapy in individuals with knee osteoarthritis³.

3. **Iijima H**, et al. Effectiveness of Mesenchymal Stem Cells for Treating Patients with Knee Osteoarthritis: A Meta-analysis toward the Establishment of Effective Regenerative Rehabilitation. *npj Regenerative Medicine* 2018;17:15.

Identification of Modifiable Risk Factors Associated with Knee Osteoarthritis

In addition to mechanistic/basic science studies, I have been working to identify the modifiable risk factors associated with progression of knee osteoarthritis. My researches addressed an important role of altered biomechanics during gait on knee pain and structural abnormality in individuals with knee OA⁴⁻⁶.

4. **Iijima H**, et al. Association of varus thrust with prevalent patellofemoral osteoarthritis: a cross-sectional study. *Gait Posture* 2017;58:394–400.
5. Fukutani N, **Iijima H**, et al. Association between varus thrust and Pain and Stiffness and Activity of Daily Living in patients with medial knee osteoarthritis. *Phys Ther* 2016;96(2):167–75.
6. **Iijima H**, et al. Clinical phenotype classifications based on static varus alignment and varus thrust in Japanese patients with medial knee osteoarthritis. *Arthritis Rheumatol* 2015;67(9):2354–62.

Human Dynamics and Biomechanical Analysis of Human Locomotion

I have been working to identify biomechanical characteristics associated with knee osteoarthritis^{7,8}. My colleagues and I have developed a markerless motion capture system in the clinical setting and applied for patients with knee osteoarthritis⁹. This novel system can non-invasively evaluate functional performance, thereby overcoming the issue of traditional analytical systems that typically require sophisticated equipment (featured in *Orthopedics Today* at October 01, 2020).

7. **Iijima H**, et al. Hip Abductor Muscle Weakness and Slower Turning Motion in People with Knee Osteoarthritis. *J Biomech* 2020;101.
8. **Iijima H**, et al. Proximal Gait Adaptations in Individuals with Knee Osteoarthritis: A Systematic Review and Meta-analysis. *J Biomech* 2019;87:127–41.
9. **Iijima H**, et al. Trunk movement asymmetry associated with pain, disability, and quadriceps strength asymmetry in individuals with knee osteoarthritis: a cross-sectional study. *Osteoarthritis Cartilage* 2019;27(2):248–56.

Journal Publications:

1. Suzuki Y, **Iijima H**, Nakamura M, Aoyama T. Rate of Force Development in the Quadriceps of Individuals With Severe Knee Osteoarthritis: A Cross-Sectional Study. [Preprint]
2. Ogawa A, **Iijima H**, Takahashi M. Staircase design for health monitoring in elderly people. *Journal of Building Engineering* 2021; 37:102152.
3. Fujita K, **Iijima H**, Eguchi R, Kuroiwa T, Sasaki T, Yokoyama Y, Koyama T, Nimura A, Kato R, Okawa A, Takahashi M. Gait analysis of patients with distal radius fracture by using a novel laser Timed Up-and-Go system. *Gait Posture* 2020;80:223–7.
4. **Iijima H**, Eguchi R, Shimoura K, Yamada K, Aoyama T, Takahashi M. Transcutaneous Electrical Nerve Stimulation Improves Stair Climbing Capacity in People with Knee Osteoarthritis. *Scientific Reports* 2020;10(1):7294.
5. **Iijima H**, Takahashi M. State of the Field of Waist-Mounted Sensor Algorithm for Gait Events Detection: A Scoping Review. *Gait Posture* 2020;79:152–161.
6. **Iijima H**, Yorozu A, Suzuki Y, Eguchi R, Aoyama T, Takahashi M. Hip Abductor Muscle Weakness and Slowed Turning Motion in People with Knee Osteoarthritis. *J Biomech* 2020;101.
7. **Iijima H**, Shimoura K, Aoyama T, Takahashi M. Low Back Pain as a Risk Factor for Recurrent Falls in People with Knee Osteoarthritis. *Arthritis Care & Research* 2020 [Epub ahead of print].
8. **Iijima H**, Inoue M, Suzuki Y, Shimoura K, Aoyama T, Madoba K, Takahashi M. Contralateral Limb Effects on Gait Asymmetry and Ipsilateral Knee Pain in Patient with Knee Osteoarthritis: A Proof-of-Concept Case Report. *JBJS Case Connect* 2020;10(1):e0418.
9. **Iijima H**, Suzuki Y, Aoyama T, Takahashi M. Relationship between varus thrust during gait and low back pain in people with knee osteoarthritis. *Arthritis Care Res (Hoboken)* 2020;72(9):1231–8.
10. Zeidan H, Eguchi R, Suzuki Y, **Iijima H**, Kajiwara Y, Harada K, Nakai K, Shimoura K, Fujimoto K, Takahashi M, Aoyama T. Detailed analysis of the transverse arch of hallux valgus feet with and without pain using weight-bearing ultrasound imaging and precise force sensors. *PLoS One* 2020;9(15):e0226914.
11. Suzuki Y, **Iijima H**, Aoyama T. Pain catastrophizing affects stair climbing ability in individuals with knee osteoarthritis. *Clinical Rheum* 2019;39(4):1257-64.
12. Sonoo M, **Iijima H**, Kanemura N. Altered sagittal plane kinematics and kinetics during sit-to-stand in individuals with knee osteoarthritis: A systematic review and meta-analysis. *J Biomech* 2019;96:109331.
13. Tajino J, Ito A, Torii Y, Tsuchimoto K, **Iijima H**, Zhang X, Tanima M, Yamaguchi S, Ieki H, Kakinoki R, Kuroki H. Lower Body Positive Pressure Diminishes the Responsiveness of Surface Blood Flow Changes during Treadmill Walking. *BMC Research Notes* 2019;12(1):733.

14. **Iijima H**, Eguchi R, Shimoura K, Aoyama T, Masaki Takahashi. Stair Climbing Ability in Patients with Early Knee Osteoarthritis: Defining the Clinical Hallmarks of Early Disease. *Gait Posture* 2019;72:148–53.
15. **Iijima H**, Shimoura K, Ono T, Aoyama T, Takahashi M. Proximal Gait Adaptations in Individuals with Knee Osteoarthritis: A Systematic Review and Meta-analysis. *J Biomech* 2019;87:127–41.
16. **Iijima H**, Aoyama T, Eguchi R, Takahashi M, Matsuda S. Effects of Interaction Between Varus Thrust and Ambulatory Physical Activity on Knee Pain in Individuals with Knee Osteoarthritis: An Exploratory Study with 12-Month Follow-Up. *Clinical Rheum* 2019;38(6):1721–9.
17. Ito A, Aoyama T, **Iijima H**, Nishitani K, Tajino J, Kuroki H. Periodic mild heat stimuli diminish extracellular matrix synthesis in pellet cultured human chondrocytes. *BMC Research Notes* 2019;12(1):16.
18. **Iijima H**, Shimoura K, Eguchi R, Aoyama T, Takahashi M. Concurrent Validity and Measurement Error of Stair Climb Test in People with Pre-radiographic to Mild Knee Osteoarthritis. *Gait Posture* 2019;68:335–9.
19. Suzuki Y, **Iijima H**, Shimoura K, Tsuboyama T, Aoyama T. Patients with early-stage knee osteoarthritis and knee pain on descending stairs have decreased hip abductor muscle strength. *Clin Rheumatol* 2019;38(8):2249–54.
20. **Iijima H**, Eguchi R, Aoyama T, Takahashi M. Trunk movement asymmetry associated with pain, disability, and quadriceps strength asymmetry in individuals with knee osteoarthritis: a cross-sectional study. *Osteoarthritis Cartilage* 2019;27(2):248–56.
21. Shimoura K, **Iijima H**, Suzuki Y, Aoyama T. Immediate effects of transcutaneous electrical nerve stimulation on pain and physical performance in individuals with pre-radiographic knee osteoarthritis: a randomized controlled trial. *Arch Phys Med Rehabil* 2018;100(2):300–6.
22. **Iijima H**, Isho T, Kuroki H, Takahashi M, Aoyama T. Effectiveness of Mesenchymal Stem Cells for Treating Patients with Knee Osteoarthritis: A Meta-analysis toward the Establishment of Effective Regenerative Rehabilitation. *npj (nature partner journal) Regenerative Medicine* 2018;17:15.
23. Tajino J, Ito A, Nagai M, Yamaguchi S, **Iijima H**, Nakahata A, Kiyan W, Aoyama T, Kuroki H. Three-dimensional motion analysis for comprehensive understanding of gait characteristics after sciatic nerve lesion in rodents. *Sci Rep.* 2018;8(1):13585.
24. Suzuki Y, **Iijima H**, Tashiro Y, Zeidan H, Shimoura K, Nishida Y, Bitoh T, Nakai K, Tatsumi M, Yoshimi S, Tsuboyama T, Aoyama T. Home exercise therapy to improve muscle strength and joint flexibility effectively treats pre-radiographic OA in community-dwelling elderly: A randomized controlled trial. *Clin Rheumatol* 2019;38(1):133–41.
25. Suzuki Y, **Iijima H**, Tashiro Y, Kajiwara Y, Zeidan H, Shimoura K, Nishida Y, Bitoh T, Nakai K, Tatsumi M, Yoshimi S, Tsuboyama T, Aoyama T. Development of a questionnaire survey to

- evaluate lower limb function of patients with knee osteoarthritis. *Clin Rheumatol* 2018;37(11):3115–23.
26. **Iijima H**, Suzuki Y, Aoyama T, Takahashi M. Quadriceps weakness in individuals with coexisting medial and lateral osteoarthritis. *JBJS Open Access* 2019; 4(1):e0028.
 27. **Iijima H**, Suzuki Y, Aoyama T, Takahashi M. Interaction between low back pain and knee pain contributes to disability level in individuals with knee osteoarthritis: A cross-sectional study. *Osteoarthritis Cartilage* 2018;26(1):1319–25.
 28. Ji X, Morino S, **Iijima H**, Ishihara M, Kawagoe M, Umezaki F, Hatanaka Y, Yamashita M, Tsuboyama T, Aoyama T. The Association of Variations in Hip and Pelvic Geometry with Pregnancy-Related Sacroiliac Joint Pain Based on a Longitudinal Analysis. *Spine (Phila Pa 1976)* 2018;44(2):E67–73.
 29. Kiyon W, Nakagawa Y, Ito A, **Iijima H**, Nishitani K, Tanimura-Nagai M, Mukai S, Yamaguchi S, Nakahata A, Zhang J, Aoyama T, Kuroki H. Ultrasound Parameters for Human Osteoarthritic Subchondral Bone Ex Vivo: Comparison with Micro-Computed Tomography Parameters. *Ultrasound Med Biol* 2018;44(10):2115–30.
 30. **Iijima H**, Ohi H, Fukutani N, Aoyama T, Kaneda E, Abe K, Takahashi M, Matsuda S. Inverted Rearfoot posture in subjects with coexisting patellofemoral osteoarthritis in medial knee osteoarthritis: an exploratory study. *J Foot Ankle Res* 2018;11:17.
 31. **Iijima H**, Aoyama T, Fukutani N, Isho T, Yamamoto Y, Hiraoka M, Miyano K, Junnouchi M, Kaneda E, Kuroki H, Matsuda S. Psychological health is associated with knee pain and physical function in patients with knee osteoarthritis: an exploratory cross-sectional study. *BMC Psychology* 2018;6(1):19.
 32. **Iijima H**, Takahashi M, Tashiro Y, Aoyama T. Comparison of the Effects of Kilohertz- and Low-frequency Electric Stimulations: A Systematic Review with Meta-analysis. *PLoS One* 2018;13(4):e0195236.
 33. **Iijima H**, Shimoura K, Aoyama T, Takahashi M. Biomechanical Characteristics of Stair Ambulation in Patients with Knee OA: A Systematic Review with Meta-analysis Toward A Better Definition of Clinical Hallmarks. *Gait Posture* 2018; 62:191–201.
 34. **Iijima H**, Takahashi M, Tashiro Y, Aoyama T. Effects of Kilohertz-Frequency Electrical Stimulation on Muscle Performance and Adverse Event in Individuals with Neuromuscular Skeletal Disorders: A Systematic Review. *The Japanese Journal of Rehabilitation Medicine* 2018;55(9):784–90.
 35. Ohi H, **Iijima H**, Fukutani N, Aoyama T, Kaneda E, Ohi K, Ito H, Matsuda S, Abe K. Varus thrust visualized during gait was associated with inverted foot in patients with knee osteoarthritis: an exploratory study. *Gait Posture* 2018;61:269–275.

36. Morino S, Ishihara M, Umezaki F, Hatanaka H, **Iijima H**, Yamashita M, Aoyama T, Takahashi M. Low back pain and causative movements in pregnancy: a prospective cohort study. *BMC Musculoskeletal Disorders* 2017;18(1):416.
37. **Iijima H**, Fukutani N, Yamamoto Y, Hiraoka M, Miyano K, Jinnouchi M, Kaneda E, Isho T, Aoyama T, Kuroki H, Matsuda S. Association of varus thrust with prevalent patellofemoral osteoarthritis: a cross-sectional study. *Gait Posture* 2017;58:394–400.
38. Tanimura-Nagai M, Harada H, Aoyama T, Yamaguchi S, Ito A, Tajino J, **Iijima H**, Zhang X, Kuroki H, Kobayashi M. Pathohistological investigation of osteochondral tissue obtained during total knee arthroplasty after osteochondral autologous transfer: a case report. *BMC Res Notes* 2017;10(1):194.
39. **Iijima H**, Ohi H, Aoyama T, Kaneda E, Ohi K, Abe K. Association of Frontal Plane Knee Alignment With Foot Posture in Patients With Medial Knee Osteoarthritis. *BMC Musculoskeletal Disorders* 2017;18(1):246.
40. **Iijima H**, Ohi H, Isho T, Aoyama T, Fukutani N, Kaneda E, Ohi K, Abe K, Kuroki H, Matsuda S. Association of bilateral flat feet with knee pain and disability in patients with knee osteoarthritis: A cross-sectional study. *J Orthop Res* 2017;35(11):2490–8.
41. **Iijima H**, Fukutani N, Isho T, Yamamoto Y, Hiraoka M, Miyano K, Jinnouchi M, Kaneda E, Aoyama T, Kuroki H, Matsuda S. Changes in clinical symptoms and functional disability in patients with coexisting patellofemoral and tibiofemoral osteoarthritis: a 1-year prospective cohort study. *BMC Musculoskeletal Disorders* 2017;18(1):126.
42. **Iijima H**, Aoyama T, Nishitani K, Ito H, Fukutani N, Isho T, Kaneda E, Kuroki H, Matsuda S. Coexisting Lateral Tibiofemoral Osteoarthritis Is Associated with Worse Knee Pain in Patients with Mild Medial Osteoarthritis. *Osteoarthritis Cartilage* 2017;25(8):1274–81.
43. **Iijima H**, Fukutani N, Isho T, Yamamoto Y, Hiraoka M, Miyano K, Jinnouchi M, Kaneda E, Aoyama T, Kuroki H, Matsuda S. Relationship between pedometer-based physical activity and physical function in patients with osteoarthritis of the knee: a cross-sectional study. *Arch Phys Med Rehabil* 2017;98(7):1382–88.
44. **Iijima H**, Ito A, Nagai M, Tajino J, Yamaguchi S, Kiyan W, Nakahata A, Zhang J, Wang T, Aoyama T, Nishitani K, Kuroki H. Physiological exercise loading suppresses post-traumatic osteoarthritis progression via an increase in bone morphogenetic proteins expression in an experimental rat knee model. *Osteoarthritis Cartilage* 2017;25(6):964–75.
45. Ji X, Takakuwa T, Takahashi M, **Iijima H**, Morino S, Ishihara M, Kawagoe M, Hadanaka Y, Umezaki F, Yamashita M, Aoyama T. Postpartum radiographic changes in pelvic morphology and its relation with symptoms of pregnancy-related symphysis pain, *Clin Exp Obst Gynecol* 2017, in press.

46. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Tajino J, Zhang X, Wataru K, Kuroki H. Effect of Low-Intensity Pulsed Ultrasound after Mesenchymal Stromal Cell Injection to Treat Osteochondral Defects: An In Vivo Study. *Ultrasound Med Biol* 2016;42(12):2903–13.
47. Fukutani N, **Iijima H**, Aoyama T, Yamamoto Y, Hiraoka M, Miyanobu K, Jinnouchi M, Kaneda E, Tsuboyama T, Matsuda S. Knee pain during activities of daily living and its relationship with physical activity in patients with early and severe knee osteoarthritis. *Clin Rheumatol* 2016;35(9):2307–16.
48. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Tajino J, Zhang X, Kiyon W, Kuroki H. The effect of exercise on the early stages of mesenchymal stromal cell-induced cartilage repair in a rat osteochondral defect model. *PLoS One* 2016;11(3):e0151580.
49. **Iijima H**, Aoyama T, Ito A, Tajino J, Yamaguchi S, Nagai M, Kiyon W, Zhang X, Kuroki H. Exercise intervention increases expression of bone morphogenetic proteins and prevents the progression of cartilage-subchondral bone lesions in a post-traumatic rat knee model. *Osteoarthritis Cartilage* 2016;24(6):1092–102.
50. Nagai M, Ito A, Tajino J, **Iijima H**, Yamaguchi S, Zhang X, Aoyama T, Kuroki H. Re-mobilization cause cyst formation in immobilization-induced knee cartilage degeneration with site specificity in an immobilized rat model. *J Anat* 2016;228:929–39.
51. Zhang X, Aoyama T, Yasuda T, Oike M, Ito A, Tajino J, Nagai M, Fujioka R, **Iijima H**, Yamaguchi S, Kakinuma N, Kuroki H. Effect of microfabricated microgroove-surface devices on the morphology of mesenchymal stem cells. *Biomed Microdevices* 2015;17(6):116.
52. **Iijima H**, Aoyama T, Tajino J, Ito A, Nagai M, Yamaguchi S, Zhang X, Kiyon W, Kuroki H. Subchondral plate porosity colocalizes with the point of mechanical load during ambulation in a rat knee model of post-traumatic osteoarthritis. *Osteoarthritis Cartilage* 2016;24(2):354–63.
53. **Iijima H**, Fukutani N, Aoyama T, Fukumoto T, Uritani D, Kaneda E, Ota K, Kuroki H, Matsuda S. Clinical impact of coexisting patellofemoral osteoarthritis in Japanese patients with medial knee osteoarthritis. *Arthritis Care Res (Hoboken)* 2016;68(4):493–501.
54. Fukutani N, **Iijima H**, Fukumoto T, Uritani D, Kaneda E, Ota K, Aoyama T, Tsuboyama T, Matsuda S. Association between varus thrust and Pain and Stiffness and Activity of Daily Living in patients with medial knee osteoarthritis. *Phys Ther* 2016;96(2):167–75.
55. **Iijima H**, Fukutani N, Aoyama T, Fukumoto T, Uritani D, Kaneda E, Ota K, Kuroki H, Matsuda S. Clinical phenotype classifications based on static varus alignment and varus thrust in Japanese patients with medial knee osteoarthritis. *Arthritis Rheumatol* 2015;67(9):2354–62.
56. Ito A, Nagai M, Tajino J, Yamaguchi S, **Iijima H**, Zhang X, Aoyama T, Kuroki H. Culture temperature affects human chondrocyte messenger RNA expression in monolayer and pellet culture systems. *PLoS One* 2015;26(5):e0128082.

57. **Iijima H**, Aoyama T, Ito A, Yamaguchi S, Nagai M, Tajino J, Zhang X, Kuroki H. Effects of short-term gentle treadmill walking on subchondral bone in a rat model of instability-induced osteoarthritis. *Osteoarthritis Cartilage* 2015;23(9):1563–74.
58. Tajino J, Ito A, Nagai M, Zhang X, Yamaguchi S, **Iijima H**, Aoyama T, Kuroki H. Intermittent application of hypergravity by centrifugation attenuates disruption of rat gait induced by 2 weeks of simulated microgravity. *Behav Brain Res* 2015;287:276–84.
59. Ito A, Aoyama T, Yoshizawa M, Nagai M, Tajino J, Yamaguchi S, **Iijima H**, Zhang X, Kuroki H. The effects of short-term hypoxia on human mesenchymal stem cell proliferation, viability, and p16INK4A mRNA expression: Investigation using a simple hypoxic culture system with a deoxidizing agent. *J Stem Cells Regen Med* 2015;11(1):25–31.
60. Nagai M, Aoyama T, Ito A, **Iijima H**, Yamaguchi S, Tajino J, Zhang X, Akiyama H, Kuroki H. Alteration of cartilage-surface collagen fibers differs locally after immobilization of knee joints in rats. *J Anat* 2015;226(5):447–57.
61. Tajino J, Ito A, Nagai M, Zhang X, Yamaguchi S, **Iijima H**, Aoyama T, Kuroki H. Discordance in Recovery Between Altered Locomotion and Muscle Atrophy Induced by Simulated Microgravity in Rats. *J Mot Behav* 2015;47(5):397–406.
62. Ito A, Aoyama T, **Iijima H**, Tajino J, Nagai M, Yamaguchi S, Zhang X, Kuroki H. Culture temperature affects redifferentiation and cartilaginous extracellular matrix formation in dedifferentiated human chondrocytes. *J Orthop Res* 2015;33(5):633–9.
63. **Iijima H**, Isho T, Aoyama T. Effects of knee orthoses on walking capacity and biomechanics in patients with knee osteoarthritis: A critical review. *OA Musculoskeletal Medicine* 2014;2(2):13.
64. Nagai M, Aoyama T, Ito A, **Iijima H**, Yamaguchi S, Tajino J, Zhang X, Akiyama H, Kuroki H. Contributions of biarticular myogenic components to the limitation of the range of motion after immobilization of rat knee joint. *BMC Musculoskelet Disord* 2014;15:224.
65. Zhang X, Aoyama T, Ito A, Tajino J, Nagai M, Yamaguchi S, **Iijima H**, Kuroki H. Regional comparisons of porcine menisci. *J Orthop Res* 2014;32(12):1602–11.
66. Ito A, Aoyama T, Tajino J, Nagai M, Yamaguchi S, **Iijima H**, Zhang X, Akiyama H, Kuroki H. Effects of the thermal environment on articular chondrocyte metabolism: A fundamental study to facilitate establishment of an effective thermotherapy for osteoarthritis. *J Jpn Phys Ther Assoc* 2014;17(1):14–21.
67. **Iijima H**, Aoyama T, Ito A, Tajino J, Nagai M, Zhang X, Yamaguchi S, Akiyama H, Kuroki H. Destabilization of the medial meniscus leads to subchondral bone defects and site-specific cartilage degeneration in an experimental rat model. *Osteoarthritis Cartilage* 2014;22(7):1036–43.

68. **Iijima H**, Aoyama T, Ito A, Tajino J, Nagai M, Zhang X, Yamaguchi S, Akiyama H, Kuroki H. Immature articular cartilage and subchondral bone covered by menisci are potentially susceptible to mechanical load. *BMC Musculoskelet Disord* 2014;15:101.
69. Ito A, Aoyama T, Tajino J, Nagai M, Yamaguchi S, **Iijima H**, Zhang X, Akiyama H, Kuroki H. Evaluation of reference genes for human chondrocytes cultured in several different thermal environments. *Int J Hyperthermia* 2014;30(3):210–6.
70. Ito A, Aoyama T, **Iijima H**, Nagai M, Yamaguchi S, Tajino J, Zhang X, Akiyama H, Kuroki H. Optimum temperature for extracellular matrix production by articular chondrocytes. *Int J Hyperthermia* 2014;30(2):96–101.
71. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Zhang X, Tajino J, Kuroki H. Effects of Exercise Level on Biomarkers in a Rat Knee Model of Osteoarthritis. *J Orthop Res* 2013;31(7):1026–31.

Manuscript under review or under preparation:

1. **Iijima H**, *et al.* Age-related increase in matrix stiffness downregulates α -Klotho in cartilage and induces cartilage degeneration.
2. **Iijima H**, *et al.* Meta-analysis and integrative omics to elucidate pathogenic mechanisms of age-related knee osteoarthritis.
3. **Iijima H**, *et al.* NOTUM -- Transcriptomic Evidence of an Exercise-Responsive Myokine Toward the Preservation of Bone Health: An Exploratory Study.
4. **Iijima H**, *et al.* People With Varus Thrust Less Responds to Quadriceps Strength Exercise on Pain Outcomes: A Secondary Analysis From a Randomized Controlled Trial.
5. **Iijima H**, *et al.* Relationship Between Lower Ambulatory Physical Activity and Poor Turning Function in People with Knee Osteoarthritis.
6. **Iijima H**, *et al.* Clinical Benefit and Harm of Transcutaneous Electrical Stimulation in Patients with Knee Osteoarthritis: A Systematic Review and Meta-analysis.
7. **Iijima H**, *et al.* Clinical Benefit and Harm of Transcutaneous Electrical Stimulation in Patients with Chronic Low Back Pain: A Systematic Review and Meta-analysis.
8. **Iijima H**, *et al.* Causal Link Between Increased Knee Pain and Biomechanical Alterations in Knee Osteoarthritis: A Systematic Review and Meta-analysis.
9. **Iijima H**, *et al.* Risk-benefit balance of repetitive physical exercise on osteoarthritic articular cartilage: a cross-cutting systematic review of human, *in vivo*, and *ex vivo* studies.
10. **Iijima H**, *et al.* Sarcopenic Knee Osteoarthritis: A Risk Factor for Recurrent Falls
11. Yamagata M, **Iijima H**, *et al.* Sex differences in knee joint biomechanics: a meta-analysis providing a mechanistic insight into severe knee osteoarthritis phenotype in females.
12. Shimizu H, **Iijima H**, *et al.* Functional manifestation in patients with early knee osteoarthritis toward the preservation of joint health: A systematic review and meta-analysis
13. Ogawa A, **Iijima H**, *et al.* Identification of Early Knee Osteoarthritis based on Knee Joint Trajectory during Stair Climbing.
14. Ogawa A, **Iijima H**, *et al.* Disease-specific turning characteristics: a systematic review and meta-analysis.
15. Suzuki Y, **Iijima H**, *et al.* Lower limb muscle strength in symptomatic early knee osteoarthritis: Defining the clinical hallmarks of early disease.
16. Suzuki Y, **Iijima H**, *et al.* Personalized multiple exercise program for improved physical function in pre-radiographic and early knee osteoarthritis patients with moderate-to-severe low back pain: A randomized controlled trial.

17. Suzuki Y, **Iijima H**, *et al.* Rate of Force Development in the Quadriceps of Individuals With Severe Knee Osteoarthritis: A Cross-Sectional Study.
18. Sonoo M, **Iijima H**, *et al.* The effect of exercise intervention on biomechanical load during gait in patients with knee osteoarthritis: A systematic review and meta-analysis
19. Usami Y, **Iijima H**, *et al.* Role of Mechanical Force in Tendon Development: A Scoping Review
20. Nakahata A, **Iijima H**, *et al.* Patellofemoral Osteoarthritis After Meniscus Instability Surgery in Rats.
21. Nakahata A, **Iijima H**, *et al.* Gait Kinematics Changes in Post Traumatic Knee Osteoarthritis with Destabilized Medial Meniscus in Rats.
22. Kubo N, **Iijima H**, *et al.* Combinational effects of rehabilitation and cell therapy on functional motor recovery after cerebral infarction: A systematic review.

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/1rME925Pq4gQo/bibliography/public/>

Google Scholar Citations:

<https://scholar.google.com/citations?user=XAQHfdwAAAAJ>

Research Gate:

https://www.researchgate.net/profile/Hiroataka_Iijima

LinkedIn:

<https://www.linkedin.com/in/hirotaka-ijima-pt-phd-95204b13a/>

News in AR³T:

<https://ar3t.pitt.edu/intl-regen-rehab-collaboration/>

Conference

Oral presentation (peer review)

1. **Iijima H**, Gilmer G, Wang K, Bean A, Ambrosio F. Age-related increase in matrix stiffness downregulates α -Klotho in cartilage and induces cartilage degeneration. 2021 World Congress on Osteoarthritis (accepted for oral presentation)
2. **Iijima H**, Gilmer G, Wang K, Sivakumar S, Matsui Y, Ambrosio F. Integrated approach of meta-analysis and bioinformatics towards elucidating disease mechanisms associated with age-related knee osteoarthritis. 2021 World Congress on Osteoarthritis (accepted for oral presentation)
3. **Iijima H**, He Y, Wang N, Lin H, Ambrosio F. The association of declining klotho expression with an onset of knee osteoarthritis in pre-clinical model and human samples. 2020 World Congress on Osteoarthritis, April 30-May 3, 2020, Wien, Austria.
4. **Iijima H**, Shimoura K, Eguchi R, Aoyama T, Takahashi M. Concurrent Validity and Measurement Error of Stair Climb Test in Individuals with Knee Osteoarthritis. 23th Annual Meeting of the Japanese Association of Physical Therapy Fundamentals, December 15-16, 2018, Kyoto, Japan. Abstract book p25.
5. **Iijima H**, Yorozu A, Suzuki Y, Eguchi R, Aoyama T, Takahashi M. Slowed turning speed in knee osteoarthritis patients with weaker hip abductor muscle. 23th Annual Meeting of the Japanese Association of Physical Therapy Fundamentals, December 15-16, 2018, Kyoto, Japan. Abstract book p33.
6. **Iijima H**, Sonoo M, Yamashita T. Risk-benefit balance of repetitive physical exercise on osteoarthritic articular cartilage: a cross-cutting systematic review of human, in vivo, and ex vivo studies. 23th Annual Meeting of the Japanese Association of Physical Therapy Fundamentals, December 15-16, 2018, Kyoto, Japan. Abstract book p26.
7. **Iijima H**, Isho T, Kuroki H, Aoyama T. Rehabilitation program after mesenchymal stem cell therapy in patients with knee osteoarthritis –a systematic review of clinical study-. The 30th Annual Meeting of the Japanese Society of Cartilage Metabolism, March 3-4, 2017, Kyoto, Japan. Abstract book p72.
8. Tajino J, Ito A, Nagai M, Zhang X, Yamaguchi S, **Iijima H**, Aoyama T, Kuroki H. Intermittent gravitation by centrifuge counteracts against the gait alteration in rats induced by two-week simulated microgravity. 20th IAA Humans in Space, June 29-July3, 2015, Prague, czech republic. Final programme p16.
9. Tajino J, Ito A, Nagai M, Zhang X, Yamaguchi S, **Iijima H**, Aoyama T, Kuroki H. Intermittent centrifugation attenuates the disruption of rat walking induced by 2-week hind limb unloading. 35th Annual International Gravitational Physiology Meeting, June 16-20, 2014, Ontario, Canada. Session 14, Abstract book p62.

10. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Tajino J, Zhang X, Akiyama H, Kuroki H. Treadmill exercise post bone marrow mesenchymal stromal cells transplantation stimulated the regeneration of articular cartilage on rat knee joint osteochondral defect. 2014 World Congress on Osteoarthritis, April 24-27, 2014, Paris, France. Osteoarthritis and Cartilage. Volume22. Supplement. April 2014. S30.

Oral presentation (non-peer review)

1. **Iijima H**. Exercise intervention for cartilage-subchondral bone unit in knee osteoarthritis. Japan × Finland Special seminar, November 26, 2015, Kyoto, Japan.

Poster presentation (peer review)

1. Shimizu H, Suzuki Y, **Iijima H**, Kanako S. Functional manifestation in patients with early knee osteoarthritis toward the preservation of joint health: A systematic review and meta-analysis. 2021 World Congress on Osteoarthritis (accepted for poster presentation)
2. **Iijima H**, Chowdhary K, Ambrosio F. NOTUM -- Transcriptomic Evidence of an Exercise-Responsive Myokine Toward the Preservation of Bone Health: An Exploratory Study. Physiatry'21, February 9-13, 2021 (Virtual congress).
3. Chowdhary K, Sahu A, **Iijima H**, Miller A, Bean A, Ambrosio F. Age attenuates the benefits of platelet-rich plasma on chondrocyte health. Physiatry'21, February 9-13, 2021 (Virtual congress).
4. **Iijima H**, Shimoura K, Aoyama T, Takahashi M. Moderate to Severe LBP was Associated with Recurrent Falls in People with Knee Osteoarthritis. ORS 2020 Annual Meeting, February 8-11, 2020, Arizona, USA. Poster No. PS2-120-2253.
5. **Iijima H**, Aoyama T. Sarcopenic Knee Osteoarthritis: A Risk Factor for Recurrent Falls. ORS 2020 Annual Meeting, February 8-11, 2020, Arizona, USA. Poster No. PS2-120-2254.
6. **Iijima H**, Takahashi M. Waist-Mounted Sensor Algorithm for Gait Events Detection: A Scoping Review. ORS 2020 Annual Meeting, February 8-11, 2020, Arizona, USA. Poster No. PS2-120-2261.
7. **Iijima H**, Wang N, Lin H, Ambrosio F. Role of the Anti-Aging Factor Alpha-Klotho in Aging-related Knee Osteoarthritis: A Pilot Study. 8th Annual International Symposium on Regenerative Rehabilitation, October 24-26, 2019, Charlottesville, USA. Poster abstract p14.
8. **Iijima H**, Sonoo M. Rehabilitative Exercise-driven Cartilage Regeneration: A Cross-Cutting Systematic Review from Ex Vivo, Animal, and Clinical Trials. 8th Annual International Symposium on Regenerative Rehabilitation, October 24-26, 2019, Charlottesville, USA. Poster abstract p15.

9. Fujita K, **Iijima H**, Okumura A, Yao Y, Nimura A, Kato R, Okawa A, Takahashi M. Gait Analysis Of Patients With Distal Radius Fracture Using A Novel Laser-tug System. ACSM's annual meeting, May 28-Jun 1, 2019, Orlando, USA. *Medicine & Science in Sports & Exercise* 51(6) Supplement;703.
10. **Iijima H**, Suzuki Y, Aoyama T, Matsuda S, Takahashi M. Relationship Between Varus Thrust During Gait and Low Back Pain in People with Knee Osteoarthritis. ORS 2019 Annual Meeting, February 2-5, 2019, Austin, USA. Poster No. PS1-061-1193.
11. **Iijima H**, Suzuki Y, Aoyama T, Matsuda S, Takahashi M. People With Varus Thrust Less Responds to Home-Based Quadriceps Exercise on Pain Outcomes: A Secondary Subgroup Analysis From a Randomized Controlled Trial. ORS 2019 Annual Meeting, February 2-5, 2019, Austin, USA. Poster No. PS2-103-1849.
12. **Iijima H**, Yorozu A, Suzuki Y, Eguchi R, Aoyama T, Takahashi M. Novel Locomotive Assessment for Knee Osteoarthritis: Laser-TUG. ORS 2019 Annual Meeting, February 2-5, 2019, Austin, USA. Poster No. PS1-039-0953.
13. **Iijima H**, Eguchi R, Aoyama T, Takahashi M. Trunk movement asymmetry was associated with pain, disability, and quadriceps strength asymmetry in individuals with knee osteoarthritis: a cross-sectional study. ORS 2019 Annual Meeting, February 2-5, 2019, Austin, USA. Poster No. PS1-036-0979.
14. **Iijima H**, Eguchi R, Shimoura K, Aoyama T, Takahashi M. Poor Stair Climbing Capacity in Early Knee Osteoarthritis: Toward a Defining Clinical Hallmarks of Early Disease. ORS 2019 Annual Meeting, February 2-5, 2019, Austin, USA. Poster No. PS2-099-1818.
15. **Iijima H**, Eguchi R, Shimoura K, Aoyama T, Takahashi M. Effects of Transcutaneous Electrical Nerve Stimulation on Stair Climbing Capacity: a Secondary Analysis of Randomized Controlled Trial. ORS 2019 Annual Meeting, February 2-5, 2019, Austin, USA. Poster No. PS2-102-1838.
16. **Iijima H**, Eguchi R, Yorozu A, Aoyama T, Takahashi M. Markerless Mobility Assessment Techniques Toward an Establishment of Outcome Measures of Regenerative Rehabilitation for Knee Osteoarthritis. 7th Annual International Symposium on Regenerative Rehabilitation, October 11-13, 2018, Seattle, USA. Poster abstract p5.
17. **Iijima H**, Isho T, Kuroki H, Takahashi M, Aoyama T. Effectiveness of Mesenchymal Stem Cells for Treating Patients with Knee Osteoarthritis: A Meta-analysis Toward the Establishment of Effective Regenerative Rehabilitation. 7th Annual International Symposium on Regenerative Rehabilitation, October 11-13, 2018, Seattle, USA. Poster abstract p3.
18. **Iijima H**, Takeda T, Harada S, Iwadata D, Otsuka K. Rehabilitation After Osteochondral Autograft Transplantation: A Single Case Report. 7th Annual International Symposium on Regenerative Rehabilitation, October 11-13, 2018, Seattle, USA. Poster abstract p10.

19. Nakahata A, **Iijima H**, Tanima-Nagai M, Ito A, Wang T, Nakahara R, Tajino J, Zhang J, Kawai H, Kubo N, Aoyama T, Kuroki H. Patellofemoral osteoarthritis progression related with gait kinematics changes in rat with destabilized medial meniscus. 7th Annual International Symposium on Regenerative Rehabilitation, October 11-13, 2018, Seattle, USA. Poster abstract p9.
20. Kubo N, Ito A, Shimogawa T, **Iijima H**, Wang T, Aoyama T, Kuroki H. Effects of the combined therapy of rehabilitation with cell therapy on motor functional recovery after cerebral infarction: A systematic review. 7th Annual International Symposium on Regenerative Rehabilitation, October 11-13, 2018, Seattle, USA. Poster abstract p15.
21. **Iijima H**, Shimoura K, Aoyama T, Takahashi M. Biomechanical Characteristics of Stair Ambulation in Patients with Knee OA: A Systematic Review with Meta-analysis Toward A Better Definition of Clinical Hallmarks. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 415.
22. **Iijima H**, Takahashi M. Proximal Gait Adaptations in Individuals with Medial Knee OA: A Systematic Review with Meta-analysis. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 427.
23. **Iijima H**, Tanima-Nagai M, Uchiyama K, Ito A, Tajino J, Nakahata A, Kiyon W, Zhang J, Ji X, Wang T, Aoyama T, Nishitani K, Takahashi M, Kuroki H. The limited knee range of motion causes progression of cartilage degeneration in the osteoarthritic knee joint: an experimental study using a preclinical model of osteoarthritis. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 735.
24. **Iijima H**, Suzuki Y, Aoyama T, Takahashi M. Quadriceps strength in individuals with coexisting medial and lateral osteoarthritis: toward an identification of modifiable risk factors in important subgroup of mild radiographic disease. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 438.
25. **Iijima H**, Yorozu A, Suzuki Y, Eguchi R, Aoyama T, Takahashi M. Specific contribution of hip abductor muscle strength to turning movement in individuals with knee osteoarthritis. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 716.
26. **Iijima H**, Eguchi R, Aoyama T, Takahashi M. Acceleration patterns of the trunk during walking in individuals with varus thrust: toward an establishment of the pathomechanics of varus thrust. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 728.
27. Nakahata A, **Iijima H**, Tanima-Nagai M, Ito A, Tajino J, Kiyon W, Zhang J, Ji X, Wang T, Aoyama T, Nishitani K, Kuroki H. Gait kinematics changes in post-traumatic knee osteoarthritis

- with destabilized medial meniscus in rat. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 719.
28. Ji X, Nakahata A, Ito A, **Iijima H**, Tajino J, Tanimura-Nagai M, Kiyama W, Zhang J, Wang T, Nishitani K, Aoyama T, Kuroki H. Assessment on the effects of high and low in vivo cyclic compressive loading on the progression of cartilage degeneration in rat knee joint. 2018 World Congress on Osteoarthritis, April 26-29, 2018, Liverpool, United Kingdom. Osteoarthritis and Cartilage. April 2018. Poster No. 732.
 29. **Iijima H**, Ito A, Nagai M, Tajino J, Yamaguchi S, Kiyama W, Nakahata A, Zhang J, Wang T, Aoyama T, Nishitani K, Kuroki H. Physiological exercise loading suppresses post-traumatic osteoarthritis progression via increase in bone morphogenetic proteins expression in an experimental rat knee model. 2017 World Congress on Osteoarthritis, April 27-30, 2017, Las Vegas, USA. Osteoarthritis and Cartilage. Volume25. Supplement1. April 2017. S391-392.
 30. Nagai M, **Iijima H**, Tajino J, Yamaguchi S, Zhang X, Kiyama W, Aoyama T, Kuroki H. Site specific influence of weight or non-weight bearing condition on the stiffness of the cartilage during short-term immobilization intervention on rat knee joint. 2016 World Congress on Osteoarthritis, March 31-April 3, 2015, Amsterdam, Netherlands. Osteoarthritis and Cartilage. Volume24. Supplement1. April 2016. A558.
 31. Ito A, **Iijima H**, Tajino J, Nagai M, Yamaguchi S, Zhang X, Aoyama T, Kuroki H. Periodic heat stimulus for extracellular matrix production on human chondrocytes. Fourth Annual Symposium on Regenerative Rehabilitation, September 24–26, 2015, Rochester, MN.
 32. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Tajino J, Zhang X, Kiyama W, Kuroki H. Efficacy of LIPUS treatment following mesenchymal stromal cell intra-articular injection in an osteochondral defect model rats. Fourth Annual Symposium on Regenerative Rehabilitation, September 24–26, 2015, Rochester, MN.
 33. **Iijima H**, Aoyama T, Ito A, Tajino J, Yamaguchi S, Nagai M, Zhang X, Kiyama W, Kuroki H. Dynamic regulation of bone morphogenetic proteins by gentle treadmill walking potentially prevent progression of osteoarthritis in a rat model of destabilized medial meniscus. Fourth Annual Symposium on Regenerative Rehabilitation, September 24–26, 2015, Rochester, MN.
 34. Fukutani N, **Iijima H**, Fukumoto T, Uritani D, Kaneda E, Ota K, Aoyama T, Tsuboyama T, Matsuda S. Influence of knee pain on various activities of daily living may reduce physical activity in patients with knee osteoarthritis according to disease severity. 9th World Congress of the International Society of Physical and Rehabilitation Medicine, June 19–23, 2015, Berlin, Germany.
 35. Tajino J, Ito A, Nagai M, Zhang X, Yamaguchi S, **Iijima H**, Aoyama T, Kuroki H. Identifying the optimal dose of the intermittent gravitation to attenuate the alteration of rat's walking induced by 2-week simulated microgravity. 36th Annual International Gravitational Physiology Meeting, June 7-13, 2015, Ljubljana Slovenia. P22, Abstract book p62.

36. **Iijima H**, Aoyama T, Ito A, Yamaguchi S, Nagai M, Tajino J, Zhang X, Kiyam W, Kuroki H. Effect of initiation timing of gentle treadmill exercise on cartilage and subchondral bone in a model of destabilization of medial meniscus of rats. 2015 World Congress on Osteoarthritis, April 30-May3, 2015, Seattle, WA. Osteoarthritis and Cartilage. Volume23. Supplement2. April 2015. A308.
37. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Tajino J, Zhang X, Kiyam W, Kuroki H. The effect of low intensity pulsed ultrasound treatment combined with mesenchymal stromal cell injection for cartilage regeneration in a knee osteochondral defect model of rats. 2015 World Congress on Osteoarthritis, April 30-May3, 2015, Seattle, WA. Osteoarthritis and Cartilage. Volume23. Supplement2. April 2015. A147.
38. Nagai M, Ito A, Tajino J, Zhang X, Yamaguchi S, **Iijima H**, Kiyam W, Aoyama T, Kuroki H. The influence of re-mobilization on altered cartilage induced by joint immobilization - pathological process of the cyst formation -. 2015 World Congress on Osteoarthritis, April 30-May3, 2015, Seattle, WA. Osteoarthritis and Cartilage. Volume23. Supplement2. April 2015. A269–270.
39. Ito A, Aoyama T, Tajino J, Nagai M, Yamaguchi S, **Iijima H**, Zhang X, Akiyama H, Kuroki H. Culturing temperature affects chondrocyte differentiation and extracellular matrix formation and redifferentiation of expanded human chondrocyte. 2014 World Congress on Osteoarthritis, April 24-27, 2014, Paris, France. Osteoarthritis and Cartilage. Volume22. Supplement. April 2014. S170.
40. Nagai M, Aoyama T, Ito A, Yamaguchi S, **Iijima H**, Tajino J, Zhang X, Akiyama H, Kuroki H. Re-mobilization of knees aggravated cartilage degeneration in an immobilization model of rats. 2014 World Congress on Osteoarthritis, April 24-27, 2014, Paris, France. Osteoarthritis and Cartilage. Volume22. Supplement. April 2014. S305.
41. Tajino J, Ito A, Zhang X, Nagai M, Yamaguchi S, **Iijima H**, Aoyama T, Kuroki H. Reloading does not attenuate the hindlimb unload-induced gait alteration: The influence of tail suspension to gait pattern of rats. 2014 World Congress on Osteoarthritis, April 24-27, 2014, Paris, France. Osteoarthritis and Cartilage. Volume22. Supplement. April 2014. S356.
42. **Iijima H**, Aoyama T, Ito A, Yamaguchi S, Nagai M, Tajino J, Zhang X, Akiyama H, Kuroki H. Regional changes of early osteoarthritis cartilage and subchondral bone fracture in a rat knee model of OA. 2014 World Congress on Osteoarthritis, April 24-27, 2014, Paris, France. Osteoarthritis and Cartilage. Volume22. Supplement. April 2014. S356.
43. Yamaguchi S, Aoyama T, Ito A, Nagai M, **Iijima H**, Tajino J, Zhang X, Akiyama H, Kuroki H. Efficacy of exercise following bone marrow mesenchymal stromal cell transplantation in an osteochondral defect model of rats. Third Annual Symposium on Regenerative Rehabilitation, April 10-11, 2014, San Francisco, CA.
44. Ito A, Yamaguchi A, Tajino J, Nagai M, **Iijima H**, Zhang X, Aoyama T, Kuroki H. Mild thermal environment enhances redifferentiation and cartilage extracellular matrix formation of expanded

- elderly human chondrocytes. Third Annual Symposium on Regenerative Rehabilitation, April 10-11, 2014, San Francisco, CA.
45. Nagai M, Aoyama T, Ito A, Tajino J, Yamaguchi A, **Iijima H**, Zhang X, Akiyama H, Kuroki H. Cartilage degeneration in immobilization rat knee joint deteriorated with re-mobilization. Third Annual Symposium on Regenerative Rehabilitation, April 10-11, 2014, San Francisco, CA.
 46. Tajino J, Ito A, Nagai M, Zhang X, Yamaguchi S, **Iijima H**, Kuroki H. Slower belt, but still enough adaptation ~the extent of a “broken escalator phenomenon”~. American Physical Therapy Association (APTA) Combined Sections Meeting (CSM), February 3-6, 2014, Las Vegas, NV.
 47. Nagai M, Ito A, Yamaguchi S, **Iijima H**, Zhang X, Tajino J, Aoyama T, Kuroki H. Contribution of biarticular myogenic components to limitation of range of motion after joint immobility. Asia-Western Pacific Regional Congress of the World Confederation for Physical Therapy (WCPT) & International Congress of Asian Confederation for Physical Therapy (ACPT) Congress 2013, September 2013, Taichung.
 48. **Iijima H**, Aoyama T, Ito A, Tajino J, Nagai M, Zhang X, Yamaguchi S, Kuroki H. Effect of unweight-bearing for mechanical properties and ultrastructure of collagen in articular cartilage. The 6th Asia-Western Pacific Regional Congress of the World Confederation for Physical Therapy (WCPT) & The 12th International Congress of Asian Confederation for Physical Therapy (ACPT) Congress 2013, September 5-9, 2013, Taichung, Taiwan. Program book p75, II-P230.
 49. **Iijima H**, Aoyama T, A. Ito, J. Tajino, M. Nagai, X. Zhang, S. Yamaguchi, H. Akiyama, H. Kuroki. Is cartilage and subchondral bone covered by menisci weak? 2013 World Congress on Osteoarthritis, April 18-21, 2013, Philadelphia, PA. Osteoarthritis and Cartilage. Volume21. Supplement. April 2013. S238.
 50. Nagai M, Ito A, Zhang X, Yamaguchi S, **Iijima H**, Tajino J, Aoyama T, Kuroki H. Changes on the expression of CD44 in immobilized knee in rats. 2013 World Congress on Osteoarthritis, April 18-21, 2013, Philadelphia, PA. Osteoarthritis and Cartilage. Volume21. Supplement. April 2013. S208.
 51. Ito A, Aoyama T, Tajino J, Nagai M, Yamaguchi S, **Iijima H**, Zhang X, Akiyama H, Kuroki H. Culturing temperature affects chondrocyte differentiation and extracellular matrix formation. 2013 World Congress on Osteoarthritis, April 18-21, 2013, Philadelphia, PA. Osteoarthritis and Cartilage. Volume21. Supplement. April 2013. S131.
 52. **Iijima H**, Isho T, Murata K, Gomi T. Effects of physical therapy for shoulder subluxation after stroke: a systematic review. 7th Academic Congress of the Asian Shoulder Association, July 7, 2011, Okinawa.

Poster presentation (non-peer review)

1. **Iijima H**, Isho T, Kuroki H, Aoyama T. Effects of Mesenchymal Stem Cells In Treating Patients With Knee Osteoarthritis and Role of Rehabilitation –a Systematic Review of Clinical study-. 3rd International Symposium on Regenerative Rehabilitation in Kyoto, February 11, 2017, Kyoto, Japan. P4, Abstract book p7.
2. Tajino J, Ito A, Tanimura-Nagai M, Yamaguchi S, **Iijima H**, Kiyama W, Aoyama T, Kuroki H. Investigating Multiple Influence of Gravitation. 3rd International Symposium on Regenerative Rehabilitation in Kyoto, February 11, 2017, Kyoto, Japan. P8, Abstract book p9.
3. Xiang J, Takahashi M, Morino S, **Iijima H**, Ishihara M, Kawaboe M, Hatanaka Y, Umezaki F, Yamashita M, Aoyama T. Postpartum radiographic changes in pelvic morphology and its relation with symptoms of pregnancy-related symphysis pain. 3rd International Symposium on Regenerative Rehabilitation in Kyoto, February 11, 2017, Kyoto, Japan. P8, Abstract book p10.
4. Yamaguchi S, Aoyama T, Ito A, Tanimura-Nagai M, Tajino J, **Iijima H**, Zhang X, Kiyama W, Kuroki H. Research for the appropriate stimulation after mesenchymal stromal cells injection to treat osteochondral defect. 3rd International Symposium on Regenerative Rehabilitation in Kyoto, February 11, 2017, Kyoto, Japan. P3, Abstract book p7.
5. **Iijima H**, Ito A, Nagai M, Tajino J, Yamaguchi S, Kiyama W, Nakahata A, Zhang J, Wang T, Aoyama T, Nishitani K, Kuroki H. Physiological exercise loading suppresses post-traumatic osteoarthritis progression via increase in bone morphogenetic proteins expression in an experimental rat knee model. 4th symposium on physical therapy in Saitama prefectural university, November 6, 2016, Saitama, Japan. 28-P1, Abstract book p27.
6. **Iijima H**, Aoyama T, Ito A, Tajino J, Yamaguchi S, Nagai M, Kuroki H. Exercise therapy for knee osteoarthritis. 2nd International Symposium on Regenerative Rehabilitation in Kyoto, March25-26, 2016, Kyoto, Japan. P7, Abstract book p8.
7. Yamaguchi S, Aoyama T, Ito A, Nagai M, Tajino J, **Iijima H**, Zhang X, Kiyama W, Kuroki H. Effect of low-intensity pulsed ultrasound after mesenchymal stromal cells injection to treat osteochondral defect. 2nd International Symposium on Regenerative Rehabilitation in Kyoto, March25-26, 2016, Kyoto, Japan. P4, Abstract book p6.
8. **Iijima H**, Aoyama T, Ito A, Nagai M, Tajino J, Yamaguchi S, Zhang X, Kiyama W, Kuroki H. Effects of exercise for joint tissue regeneration in osteoarthritic knee. 1st International Symposium on Regenerative Rehabilitation in Kyoto, March 29, 2015, Kyoto, Japan.

Seminars and Invited Lectureships Related to Research:

1. December 2018– Invited Lecture, 23th Annual Meeting of the Japanese Association of Physical Therapy Fundamentals
“A Cross-Cutting Research in Knee Osteoarthritis: Toward An Establishment of Regenerative Rehabilitation”
2. December 2018– Invited Lecture, Sixth Research Symposium in Saitama Prefectural University
“A Cross-Cutting Research in Knee Osteoarthritis: Toward An Establishment of Regenerative Rehabilitation”
3. April 2017 – Lecture of Motor Function Analysis in Kyoto University
“Regenerative Rehabilitation and Knee Osteoarthritis”
4. January 2017 – Lecture of Pharmaceutical Sciences in Tokushima University
“Current and Future Research of Knee Osteoarthritis: Toward 2020 years”
5. July 2015 – Lecture of Pharmaceutical Sciences in Tokushima University
“Shuttle Between Bedside and Bench: As A Physical Therapist”
6. March 2014 – Research Seminar, Rehabilitation Day Service Acty
“Reconsidering of Physical Therapy from Pathology of Knee Osteoarthritis: Risk and Benefit of Exercise Therapy”
7. January 2014 – Research Seminar, Nozomi Orthopaedic Clinic
“Therapeutic Strategy for Patients with Knee Osteoarthritis”
8. November 2013 – Invited Lecture, First Research Symposium in Saitama Prefectural University
“Biology of Knee Osteoarthritis”
9. September 2013 – Rehabilitation Research Seminar, Fifth Functional Innovation Research Institute “Identification of Varus Thrust-Based Novel Subgroup in Knee Osteoarthritis”
10. April 2013 – Rehabilitation Research Seminar, Kyoto Hakuai Hospital
“Biology and Rehabilitation of Knee Osteoarthritis”

Referee/Reviewer Experience:

Journal Review

1. Osteoarthritis and Cartilage (Outstanding Contribution in Reviewing in 2016)
 2. Acta Biomaterialia
 3. Journal of Biomechanics
 4. IEEE Transactions on Neural Systems
 5. Gait & Posture
 6. Clinical Biomechanics
 7. Scientific Reports
 8. Osteoarthritis and Cartilage Open
 9. Journal of Applied Physiology
 10. European Journal of Clinical Investigation
 11. Stem Cell International
 12. Archives of Gerontology and Geriatrics
 13. PLoS One
 14. The Knee
 15. Clinical Rheumatology
 16. The Journal of Rheumatology
 17. Histology and Histopathology
 18. Journal of Immunological Sciences
 19. BMJ Open
 20. BMC Musculoskeletal Disorder
 21. Clinical Rehabilitation
 22. Journal of Translational Medicine
 23. Physical Therapy in Sport
 24. Medical Science Monitor
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Editorial Responsibilities:

Editorships

Guest Editor, Journal of Visualized Experiments, 2020

Research Support and/or Scholastic Performance:*Current Grant Support*

11/01/2020-10/31/2021, 2.0 calendar

Scott F. Nadler PASSOR Musculoskeletal Research Grant, \$30,000

“From platelet dust to extracellular vesicles – the mechanistic study of platelet-rich plasma and its role in the treatment of osteoarthritis”

Role: Co-I

The overarching goal of this study is to assess the age-dependent role of Platelet-rich Plasma (PRP) on musculoskeletal tissue mitochondrial function. We propose that EVs are mediators of restorative properties in young PRP through enhanced chondrocyte mitochondrial function. Two specific aims will test our central hypothesis:

Specific Aim 1: To test the hypothesis that the beneficial impact of PRP on cartilage integrity is attenuated with increasing age. Specific Aim 2: To test the hypothesis that circulating EVs in PRP derived from young individuals promote chondrocyte mitochondrial function, but the beneficial impact is diminished with increasing age.

04/01/2019-03/31/2021, 8.0 calendar

Grant-in-Aid for Japan Society for the Promotion of Science Overseas Research Fellowships, \$111,000

“Niche Rehabilitation Toward an Optimal Joint Microenvironment for Bone Marrow-Derived Mesenchymal Stem Cell Transplantation”

Role: PI

Mechanical stimulation, such as rehabilitation, has the potential to improve microenvironment within the knee joint, thereby enhancing the cartilage repair effect of injected and/or implanted mesenchymal stem cells (MSCs). To verify this concept, “niche rehabilitation”, this study aims to (1) examine the effect of rehabilitation (i.e., electrical stimulation-induced quadriceps muscle contraction) before MSC treatment on the MSC treatment efficacy using a preclinical model of post-traumatic knee OA; and (2) elucidate its mechanism. The general hypothesis is that quadriceps muscle contraction before MSC injection enhances both homing and trophic effects of injected MSC, thereby enhancing cartilage regeneration and functional recovery. Before performing this pre-clinical experiment, a systematic review and cytokine analysis after rehab will be performed to identify potential factors that enhance MSC’s homing and trophic effects.

18045240, 04/01/2018-, 2.0 calendar

JSPS KAKENHI, Grant-in-Aid for Japan Society for Early-Career Scientists, \$39,685

“Multiple Sensor-Based Predictive Algorithm for Musculoskeletal Disease”

Role: PI

Knee osteoarthritis (OA) is a leading cause of knee pain and chronic disability in the elderly and subsequent mobility limitation. Mobility limitation is typically considered one of the most significant consequences in individuals with knee OA. This study aims to establish a novel locomotive assessment method that synchronizes inertial measurement unit, depth sensor, and laser range sensor. The proposed method evaluates kinematic and kinetic characteristics during functional locomotion in a non-invasive manner in patients with knee OA.

Pending Grant Support

Department of Defence (DoD)

“Optimizing Muscle and Bone Mechanoadaptation to Physical Training: Understanding the Mechanistic Pathways via Muscle Bone Crosstalk to Altered Mechanical Loading”

Role: Co-I

Completed Research

17J03084, 04/01/2017-03/31/2020, 10.0 calendar

Grant-in-Aid for Japan Society for the Promotion of Science Research Fellows (PD), \$28,677

“Dynamic Diagnostic System for Knee Osteoarthritis and Tailor-made Rehabilitation”

Role: PI

This study aimed to develop a dynamic movement-based diagnostic method of patients with knee osteoarthritis (OA) using a marker less motion capture system.

15J08195, 04/01/2015-03/31/2017, 12.0 calendar

Grant-in-Aid for Japan Society for the Promotion of Science Research Fellows (DC2), \$17,576

“Histopathological Changes of Physiological Exercise in A Rat Knee Model of Post-traumatic Osteoarthritis”

Role: PI

This study aimed to test the central hypothesis that physiological exercise improves articular cartilage integrity in the knee joint through increased bone morphogenetic protein.

Patents and Inventions:

1. METHODS AND MATERIALS FOR TREATING OSTEOARTHRITIS – US Patent (Pending)

Academic Responsibilities:

Graduate Student Advising

Completed

Doctoral Thesis; Hiroshi Ohi *Varus thrust visualized during gait was associated with inverted foot in patients with knee osteoarthritis: an exploratory study.*

Doctoral Thesis; Yusuke Suzuki *Home exercise therapy to improve muscle strength and joint flexibility effectively treats pre-radiographic OA in community-dwelling elderly: A randomized controlled trial.*

Doctoral Thesis; Naoto Fukutani *Association of Varus Thrust With Pain and Stiffness and Activities of Daily Living in Patients With Medial Knee Osteoarthritis.*

Master’s Thesis; Hiroshi Ohi *Relationship between varus thrust during gait and foot posture in individuals with knee osteoarthritis.*

Master’s Thesis; Kanako Shimoura *Immediate effects of transcutaneous electrical nerve stimulation on pain and physical performance in individuals with pre-radiographic knee osteoarthritis: a randomized controlled trial.*