

バイオメカニクス研究室

Biomechanics Research Laboratory

● バイオメカニクス、医用工学、スポーツ科学



教授 **小田 俊明**
Professor
Toshiaki Oda



研究概要 / Research overview

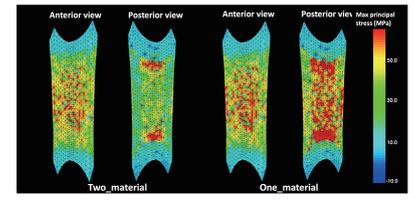
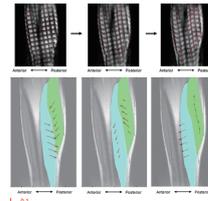
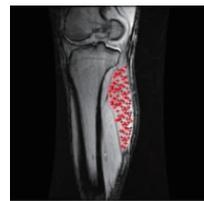
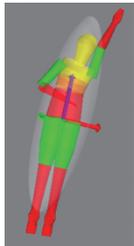
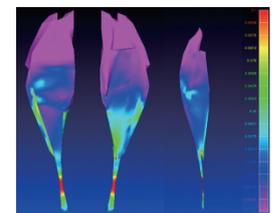
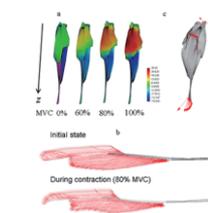
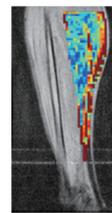
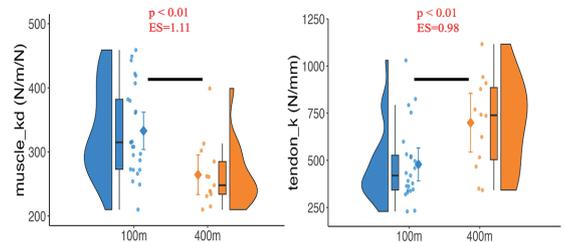
運動器、特に骨格筋の機能について、医用画像を用いた実験とシミュレーションの両面から研究をしている。骨格筋中の腱や結合組織の重要性について検討した研究では複数の学会賞を受賞した。トップアスリートを対象とした研究も多く、ビッグデータを用いた選手の競技力や健康状態のサポートに関するスポーツデータサイエンス研究も展開中です。

My research focuses on the function of the musculoskeletal system, particularly skeletal muscles, through both experimental studies using medical imaging and computational simulations. I have received multiple academic awards for studies highlighting the importance of tendons and connective tissues within skeletal muscles. I also conduct extensive research on elite athletes, including ongoing projects using big data to support their performance and health.

研究 / Research

医用画像による生体内の実測や、それらを用いた計算機シミュレーションを行うことで、トレーニング科学やリハビリテーションに必要な基礎的で詳細な知見を明らかにできます。また、機械学習を用いたスポーツ等の研究、ドローンやカメラを用いた計測研究も実施しています。

By conducting in vivo measurements using medical imaging and applying computational simulations based on those data, I aim to reveal fundamental and detailed insights essential for training science and rehabilitation. In addition, I conduct research in sports science using machine learning, as well as measurement studies using drones and cameras.



研究成果例

- Degree of twist in the Achilles tendon interacts with its length and thickness in affecting local strain magnitude: a finite element analysis. Enomoto, S., Furuuchi, S., Ishibashi, T., Yamada, S., Oda, T. *Frontiers in Bioengineering and Biotechnology* 12, 2024.
- Muscle-tendon architecture in Kenyans and Japanese: Potential role of genetic endowment in the success of elite Kenyan endurance runners. Kunimasa, Y., Sano, K., Oda, T., Nicol, C., Komi, P., Ishikawa, M. *Acta Physiologica* 235(2), 2022.
- Dynamics of quadriceps muscles during isometric contractions: Velocity-encoded phase contrast MRI study. Oda, T., Malis, V., Finni, T., Kinugasa, R., Sinha, S. *Diagnostics* 11(12) 2280, 2021.