

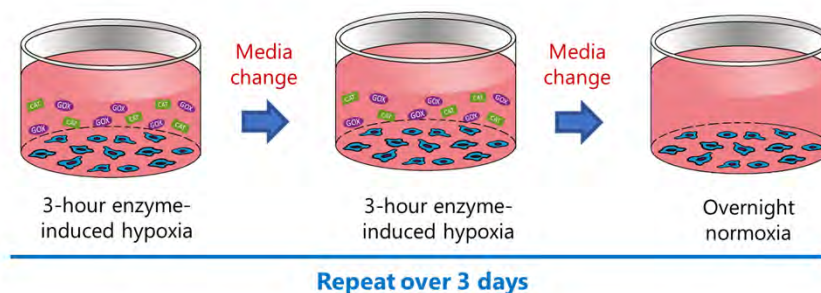
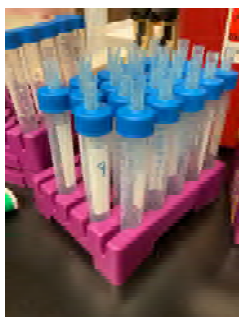
Research Topic	Tissue-engineering skeletal muscle	(Faculty) Engineering
Host University	Clemson University / Clemson / South Carolina / USA	(Department) Biomedical engineering
Duration	From NOV 30, 2022 to JAN 3, 2023	(Student Name) Kaito Sasaki

## Summary of the Research Activities

My research is to elucidate the relationship between muscle contractility and myokine secretion using the tissue-engineered (TE) skeletal muscle. Myokines are cytokines produced and released by skeletal muscle cells during muscular contractions. Myokines have various effects, such as preventing metabolic syndrome, diabetes, progression of arteriosclerosis, dementia, osteoporosis, cancer, and the development of age-associated diseases. In my laboratory, electrical, mechanical, and drug stimuli are applied to TE skeletal muscles to enhance contractility and myokine secretion.

The Cell Mechanics and Mechanobiology Laboratory in Clemson University is currently conducting research in the areas of hydrostatic mechanotransduction, multifunctional hydrogel tissue adhesives, and functional tissue engineering of intervertebral discs. They relate to urological and cardiovascular diseases. I was primarily involved in developing a new kind of bioreactor that reproduce the physicochemical environment of bladder outlet obstruction (BOO), including pressure, extensibility, and oxygen tension, and conducting experiments to evaluate inflammatory responses using caspases.

Caspases are associated with inflammatory cytokines. Since interleukin 6, one of myokines, is also inflammatory cytokine, I learned much about evaluation method of caspases.



## College Life, Friends and Others

Clemson university is famous for American football. The stadium is located on campus and can accommodate approximately 80,000 visitors (Figure.1).

I enjoyed BBQ with my roommates in the share house (Figure.2).



Figure.1



Figure.2

## 指導教員講評

新しい技術や知識が習得でき、生活も楽しめたようで、とても良かったです。得られた経験を今後に活かせるよう期待しています。

指導教員氏名: 藤里俊哉