

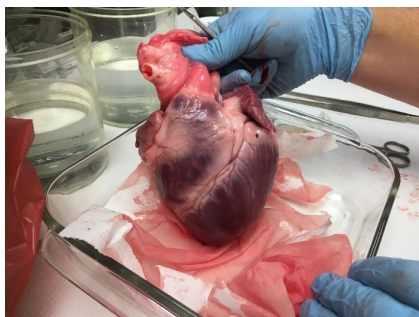
Research Topic	Myokines in skeletal muscle	Graduate School of Engineering
Host University	Clemson University / Clemson, South Carolina / USA	Applied Chemistry, Environmental and Biomedical Engineering
Duration	From November 18 to December 22, 2019	SHIRAI Yuko

## Summary of the Research Activities

My research is in relation to myokine secretion from tissue-engineered (TE) skeletal muscle (artificial skeletal muscle). Myokines are small proteins released from skeletal muscle and may have positive effects on our health. In my laboratory, three-dimensional TE skeletal muscle has been developed using the mouse muscle cell line and collagen scaffold. So, I am now working to find best condition for myokine secretion from our TE skeletal muscle by contracting it using electrical and/or mechanical stimulation. Then, I am going to investigate its effects to cancer cells, muscle cells, and nerve cells.

BTRL (Biocompatibility and Tissue Regeneration Laboratory) in Clemson University is focusing on tissue engineering and regenerative medicine of cardiovascular and orthopedic systems. In BTRL, decellularization of heart and heart valves and their recellularization using bioreactor are investigated. Decellularized tissue in which cells are removed is to be used as regenerative medicine materials.

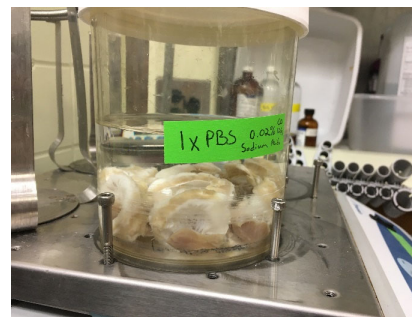
I decellularized a porcine mitral valve which is located between left ventricular and left ventricle. I am also using decellularized blood vessel for my TE skeletal muscle as artificial tendons, but the procedure for decellularization in BTRL was different from ours. It was difficult to trim mitral valves after extraction from heart because it was first time for me to do. I did decellularization of mitral valve only, however learned much about decellularization.



Porcine heart



Mitral valve



Decellularized valve

## College Life, Friends and Others

Clemson university is famous for American football. There were many sports shops around university.



I was invited to a Christmas party at the professor's house. I ate many foods we brought and exchanged gifts.



## 指導教員講評

短い期間でしたが、新しい技術や知識を習得しつつ、海外での生活を楽しめたようで、とても良かったです。得られた経験を今後活かせるよう期待しています。

指導教員氏名：藤里 俊哉