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FIRST PERSON

First person – Shengli Gu

First Person is a series of interviews with the first authors of a selection of papers published in Biology Open, helping early-career researchers promote themselves alongside their papers. Shengli Gu is first author on 'Morphological mechanism allowing a parasitic leech, O*zobranchus jantseanus* (Rhynchobdellida: Ozobranchidae), to survive in ultra-low temperatures', published in BiO. Shengli is a PhD student in the lab of Niuwang Nie at Anhui Normal University, Wuhu, China, investigating the true cause of the parasite's resistance to adversity from multiple perspectives such as morphology and omics.

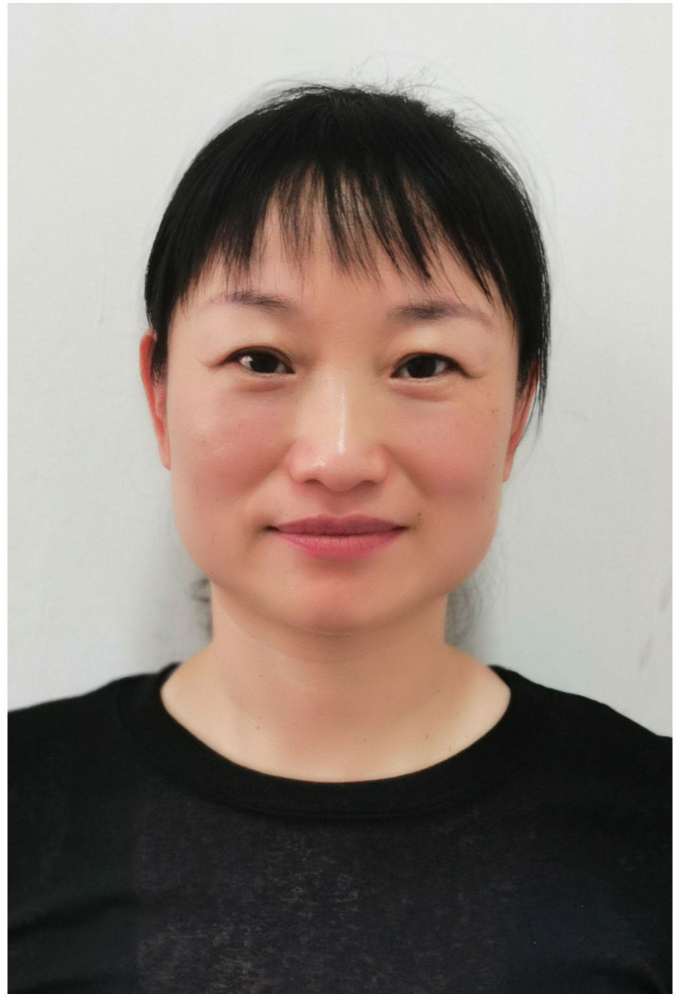

Fig. 1. Shengli Gu

What is your scientific background and the general focus of your lab?

My tutor's lab is focused on cell biology research of turtles, mainly analyzing the molecular mechanism of morphological and functional changes through molecular biology and omics methods. At present, I am mainly engaged in morphological and molecular biology research of parasites in turtles.

How would you explain the main findings of your paper to non-scientific family and friends?

It was found that a leech that is put directly into liquid nitrogen for 96 h can survive efficiently (about 87%) after resuscitation. The leech could also withstand desiccation and its survival rate after rehydration was 100% when they lost most of the total water (about 85%). The reason for its tolerance to ultra-low temperatures may be due to its rapid and short-term tolerance to dehydration. It was observed that under ultra-low temperature and dehydration conditions, it can quickly form a hemispherical shape, and transparent glass-like substances can be seen on the body surface.

What are the potential implications of these results for your field of research?

As the largest metazoan known to survive in liquid nitrogen without pre-treatment to date, the species is a very good model for studies of ultra-low temperature tolerance and provides additional data for resolving related scientific issues, such as the resuscitation of entire living organisms after freezing.

What has surprised you the most while conducting your research?

Why can such large multi-cellular animals (about 3–16 mm×1.2–7 mm in size) tolerate the freezing in liquid nitrogen and drying, and what are the inherent mechanisms of freeze tolerance and post freezing repair?

What, in your opinion, are some of the greatest achievements in your field and how has this influenced your research?

At present, there are a lot of reference research methods on the stress resistance of Tardigrada and African chironomid, and some saccharides and proteins have been found to play a key protective role. In this study, we found that the leech has the ability of resistance to desiccation, and the mechanism of freeze tolerance may be related to its tolerance to desiccation. By referring to previous studies, we tried to find answers from further omics research.

What changes do you think could improve the professional lives of early-career scientists?

In my opinion, publicity can promote the communication and learning among peers and getting technical and financial support.

What's next for you?

I will carry out omics research, and try to find the real reason for the species' resistance to adversity at the molecular level.

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Biology Open (2021) 10, bio058867. doi:10.1242/bio.058867

Fig. 2. The hemispherical shape of *Ozobranchus jantseanus* resistant to ultra-low temperatures and dehydration.

Reference

Gu, S., Liu, J., Xiong, L., Dong, J., Sun, E., Hu, H., Yang, M., and Nie, L (2021). Morphological mechanism allowing a parasitic leech, O*zobranchus jantseanus* (Rhynchobdellida: Ozobranchidae), to survive in ultra-low temperatures. *Biology Open* **10**, bio058524. doi:10.1242/bio.058524