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News

Chen Chiu wins 2010 JEB Outstanding Paper Prize

The Editors of *The Journal of Experimental Biology* are pleased to announce that Dr Chen Chiu is the winner of this year's JEB Outstanding Paper Prize. 'The prize is awarded in recognition of an outstanding achievement and is intended to encourage young scientists,' says Hans Hoppeler, the JEB Editor-in-Chief, and adds, 'We truly appreciate when authors submit their very best work to the JEB.' Explaining how the prize is awarded, Hoppeler says, 'Over the year, we note all the truly outstanding contributions, and the selection is then made by a vote of all of the Editors.'

Chiu was the first author on the paper 'Effects of competitive prey capture on flight behaviour and sonar beam pattern in paired big brown bats, *Eptesicus fuscus*' (Chiu et al., 2010) and admits that she was, 'Very surprised because I didn't know that there is such a prize, but then I was very happy. It feels like all the hard work paid off'. Reflecting on the paper, Editor Andy Biewener says, 'This study reports exciting results that bats employ a follower–leader strategy using classical pursuit,' and Hoppeler adds, 'The study is exceptional for its use of cutting edge technology and data analysis to study a behaviourally complex situation.'

Chen Chiu, winner of the 2010 JEB Outstanding Paper Prize.

Chiu joined Cynthia Moss's lab at the University of Maryland in 2002 after graduating from the National Taiwan University with a BSc in Zoology in 2000. 'I came to Cindy's lab because I am interested in bats and I wanted to learn more about their echolocation and flight behaviour,' says Chiu. Moss explains that she is interested in understanding orientation and navigation in the environment and the sensory motor integration required for spatially guided behaviour. 'We've been working for some time using specialised facilities in the lab that allow for the reconstruction of the bat's flight path in 3D combined with sound recordings that allow us to determine where the sound beam is directed as well as the characteristics of the calls,' says Moss.

Embarking on her PhD, Chiu began a series of studies looking at the vocal and flight behaviours of bat pairs competing for prey. 'She made the discovery that often times one bat in this situation would go silent,' recalls Moss, who published the discovery that bats sometimes stop vocalising to avoid jamming with Chiu and Wei Xian in *PNAS* in 2008 (Chiu et al., 2008). Continuing her work, Chiu then became interested in how duelling bats track each other as they compete to catch prey. Noticing that one dominant bat usually caught the target and that the trailing bat often outmanoeuvred the leader in the closing moments, Chiu began analysing the call patterns of the duelling animals to find out how they tracked each other.

'We animate the data so we can create a video of the bat's flight path and play the corresponding sounds that the bat is producing at any moment in time, and these animations help reveal patterns of results that are difficult to extract from static displays of the data,' explains Moss. Painstakingly analysing hundreds of bat dogfights and converting them into animations that could be analysed, Chiu teamed up with P. S. Krishnaprasad and Puduru Reddy to discover other aspects of the duelling bats' strategies. Together, they realised that the trailing bat focuses its echolocation calls on the bat that it is pursuing (Chiu et al., 2010). Chiu explains that this is a completely different strategy from the one that bats adopt when pursuing prey, when they fly so that the invisible line (joining the bat to its victim) maintains a constant orientation as the bat and its victim proceed.

Reflecting on working with Chiu, Moss says, 'Chen has worked *so hard*, the analysis of these data is very tedious and a lot of students get discouraged by the boring aspects of the analysis but her hard work has led to so many extraordinarily interesting discoveries that I use her as a model for other students that are not quite so far along in their work.' Chiu admits that this is possibly the most exciting work that she has done during her time in Moss's lab. 'I have done several research projects about bats in the Moss lab and the most exciting one was the study about two bats changing their echolocation and flight behaviour when flying together in the same room. No one has done such research before and I needed to develop a new method to analyse my data.'

Looking to the future, Chiu is planning to join Sharon Swartz early next year to work on bat flight kinematics, but before moving to Rhode Island, Chiu and her husband have to get used to the arrival of their new son, Vitus, who was born in September. 'He was born about a month earlier than expected,' says Moss, who adds, 'but he's doing fine and Chen is very much enjoying motherhood.'

Kathryn Knight
News and Views Editor

References

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