**Settling into the Groove: Decreases in Metabolic Rate with Increasing Flight Duration in *Eptesicus fuscus***

Lucas J. S. Greville1, Jade Legros2, Paul A. Faure3 and Liam P. McGuire1

***1*** *Department of Biology, University of Waterloo, Waterloo, CAN;* ***2*** *Department of Biology, McGill University, Montreal, CAN;* ***3*** *Department of Psychology, Neuroscience & Behaviour, McMaster University, Hamilton, CAN*

Flight is the most energetically costly form of locomotion per unit time, yet bats are able to sustain flight over large distances and for many hours at a time. Studies to date have primarily focused on just the first couple minutes of flight, a period during which bats transition into steady state forward flight. We explore how the energetic cost of sustained flight changes with flight duration using big brown bats (*Eptesicus fuscus*). Using a within-subjects repeated measures design and the 13C-labelled sodium bicarbonate isotope tracer method to estimate energetic expenditure, bats were flown from 2 – 11 minutes in an outdoor flight chamber with video recordings used to calculate the duration of each flight. Flight metabolic rate decreased with flight duration with bats reaching a sustained steady-state metabolic rate at ~6 mins of flight. These results indicate that bats undergo a change in metabolic processes as they transition between initial and sustained flight periods, suggesting past studies of short duration may overestimate the energetic cost of flight. Future studies should examine changes in the metabolic pathways and micronutrient fuel sources of bats during flight, with opportunities for comparative studies among species of bats that differ in foraging and flight strategies.