

HONOURS PROJECT

Project Title: Evaporative water loss control by a dasyurid marsupial.



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Project: Recent studies have demonstrated that small mammals and birds have acute physiological control of insensible evaporative water loss (EWL). There are two theories concerning the adaptive significance EWL regulation. It may aid in thermoregulation, or facilitate water conservation. If the major adaptive significance of EWL regulation is water conservation, we would expect arid-habitat species to have greater control of EWL under perturbing conditions compared with mesic species. To determine this, we need to analyse data concerning EWL control for a number of species in an environmental, allometric and phylogenetic context. This study will examine the ability of a small-medium sized dasyurid marsupial to maintain EWL constancy under perturbing environmental conditions, and then assess this ability compared to other dasyurid marsupials using modern comparative approaches to determine if there are body size or environmental effects on EWL regulatory ability.

Funding: ARC Discovery grant

Special Requirements: This project will require regular care, maintenance and monitoring of research animals, including on weekends.

References:

- Withers, P.C. and Cooper, C.E. (2014) Physiological regulation of evaporative water loss in endotherms: is the little red kaluta (*Dasykaluta rosamondae*) an exception or the rule? *Proceedings of the Royal Society B*. 281: 20140149.
- Cooper, C.E. and Withers, P.C. (2014) Physiological responses of a rodent to helox reveal constancy of evaporative water loss under perturbing environmental conditions. *American Journal of Physiology*. 307: R1042-R1048.
- Cooper, C.E. and Withers, P.C. (2017) Thermoregulatory role of insensible evaporative water loss constancy in a heterothermic marsupial. *Biology Letters*. 13; 20170537