

Digestive performance and enzyme/transporter function

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Activities of specific digestive enzymes often show a correlation with the presence or absence of their substrates in the diet. Disaccharidase activities, for example, appear to be broadly related to diet. Nectar-feeding passerine birds and hummingbirds feed on sucrose rich diets, and show much higher activity of the membrane-bound disaccharidase sucrase-isomaltase than other groups of birds. It's unclear whether patterns in digestive performance in these birds are a consequence of functional changes in proteins (e.g. adaptation in substrate affinity), changes in level of gene expression of highly conserved proteins, or both. This project will explore the relationship between levels of enzyme activity, substrate affinity, and enzyme protein gene expression, using nectar-feeding Australasian honeyeaters as a model.

Similar projects relating digestive performance and/or plasticity to gut morphology and/or function or expression of digestive enzymes and nutrient transporters can also be developed in other animal models.