

Comparing Koala Retrovirus Infection Between Central and South East Queensland Koalas

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Dr Bonnie Quigley¹

¹ University of the Sunshine Coast, Sippy Downs, QLD 4556, Australia

Background and Significance

The survival of the koala (*Phascolarctos cinereus*) is under serious threat, with this iconic marsupial declared “vulnerable” by the Australian government in 2012. A major contributor to this decline is disease, with *Chlamydia* widely recognised as the major infectious threat, and the relatively recently discovered retrovirus, Koala Retrovirus (KoRV), a threat itself and worse when combined with *Chlamydia*. KoRV is from the same family of viruses as HIV and has been detected in all South East Queensland koalas tested to date (Quigley et al., 2018). Currently, seven subtypes of KoRV (A-I) are recognised, and KoRV-B infection is significantly linked to chlamydial disease and cancer deaths in koalas from South East Queensland (Quigley et al., 2018; Chappell et al., 2017). However, similar testing has not been conducted in other parts of Queensland. Testing location is important, as genetic analysis of Queensland koalas revealed two different lineages of koalas co-occurring north of Brisbane, with possible biogeographic barriers at the St Lawrence Gap (near Rockhampton) and the Brisbane Valley (at Brisbane) (Neaves et al., 2016; Bryant & Krosch, 2016). This

suggests that it may not be accurate to extrapolate test results from koalas around Brisbane to koalas north of Rockhampton. With strong evidence that KoRV is involved in very serious koala health conditions, it is time for focused research into KoRV across Queensland.

Objective

The objective of this study is to determine the prevalence and diversity of all seven subtypes of KoRV in two distinct areas of Queensland. We will evaluate whether there are differences in KoRV between South East Queensland koalas and Central Queensland koalas that could affect management practices (like relocating koalas) between these areas.

We expect all Queensland koalas to be infected with at least one KoRV subtype; however, we anticipate different patterns in virus diversity between the biogeographical barriers. Learning how these patterns differ between koalas will be important for KoRV vaccine development (under way by the USC research team) and will inform *Chlamydia* treatment and koala translocation strategies across Queensland.

Investigators

Dr Bonnie Quigley, University of the Sunshine Coast, is a post-doctoral research fellow with 12 years' experience in microbiology research. Dr Quigley currently works with Prof. Peter Timms, a world-leading expert on chlamydial disease and vaccination in koalas.

Dr Alistair Melzer is an established koala ecologist and research program leader of the Koala Research Centre of Central Queensland at CQU.

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