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Progress towards the development of a chlamydia*l* vaccine for koalas

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Wild koala populations continue to experience serious declines as a result of factorsincluding, (i) loss of habitat, (ii) motor vehicle trauma; (iii) dog attacks; (iv) chlamydial disease. Modeling shows that targeting chlamydial diseasewould have the greatest potential impact on stabilizing population decline.In the koala, chlamydial infections have been associated with diseases ranging from ocular disease leading to blindness, as well as urinary and genital tract disease. An effective vaccine to prevent the adverse consequences of chlamydial infections in koalas would provide an important management tool to stop the population decline in this species. In the first trial we vaccinated groups of captive healthy koalas via the subcutaneous route, using the chlamydial MOMP antigen. We observed good serum and vaginal secretion antibodies as well as specific lymphocyte proliferation responses.In the next trial we utilised a recombinant MOMP protein, cloned from a *C.pecorum* koala isolate. We vaccinated two groups of koalas, (i) wild caught animals that were clinically healthy and Chlamydia PCR negative, (ii) wild caught animals that had clinical signs of disease.Following vaccination, there was no increase in inflammatory pathological changes in any animals. Strong antibody (including neutralizing antibodies) and lymphocyte proliferation responses occurred in all vaccinated koalas.In the third trial we compared three genotypes of MOMP, designatedto match the circulating genotypes in wild populations and demonstrated promising cross-strain immune responses. In the fourth trial, which we are just completing, we have obtained good immune responses in male koalas. So far, we have shown that a multi-subunit chlamydial vaccine can be safely administered to both healthy koalas as well as koalas that have a previous or current chlamydial infection. Specific anti-MOMP antibodies are produced at high levels and, importantly, these antibodies are neutralizing in vitro. Equally importantly, these antibodies from immunized animals (but not from naturally infected animals) were able to cross neutralize other MOMP types, suggesting that induction of immunity against multiple genotypes may be possible.

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