PROGRESS REPORT FOR SAFFIRE/ WILDCARE

from: the Tasmanian devil immunology research group, Menzies Institute for Medical Research, University of Tasmania

for: the grant provided by Saffire through Wildcare Tasmania for the salary of the group's part-time research veterinarian, Ruth Pye BVSc, MVS (Conservation Medicine), PhD

time period: May 2019 – August 2020

"Rosie" and "Lucy", Richmond

SUMMARY OF RESEARCH VETERINARIAN ACTIVITIES 2019-2020:

DFTD immunisation trials on devils for wild release, and post-release monitoring

In 2016, 33 devils immunised against DFTD were released at Stony Head on the mid north coast. Monitoring of the site is being continued by the Save the Tasmanian Devil Program and the Australasian Genomics Wildlife Group, University of Sydney. Ruth is now on the USyd animal ethics permit, and she will continue to join these monitoring trips to collect blood and tumour samples from the devils. The most recent trip was March 2020.
There have been no immunised devils re- trapped at Stony Head since 2018, and so the results obtained from those immunised devil samples have been compiled for publication (see below).

Opportunistic sampling from wild devils

Serum samples collected from wild devils over the past four years have been analysed at Menzies and have yielded some exciting results with respect to naturally occurring immune recognition of devil facial tumour disease. This collection of samples from "interesting devils" has coincided with the development of a deep genome sequencing technique by the Australasian Genomics Wildlife Group, University of Sydney. Ruth and fellow Menzies devil group members are collaborating closely with the Sydney group to determine if there is a genetic explanation for the immune recognition amongst these particular devils.

Animal Ethics Committee approval for a quoll comparative immunology project

The devil group at Menzies has a particular interest in comparative and wild immunology, alongside the primary focus of devil immunology and DFTD vaccine development. Ruth is the responsible investigator for the project "Testing the cross reactivity of Tasmanian devil immunology reagents on spotted tail quoll and eastern quoll blood and tissue samples", which received AEC approval in June 2020. This project will help determine similarities between the dasyurid species (devils and quolls). It will also identify available reagents to analyse the quolls' immune system and responses should a disease or other threat make this a pressing issue.

Ruth releasing a spotted tail quoll that was trapped in a devil trap at Stony Head

Captive devils at Richmond

The Menzies devil group currently has 5 devils at a facility near Richmond for research purposes. Ruth, as research vet, is responsible for the health and welfare of these devils, and liaises closely with the Richmond devil keeper.

Ruth collects blood samples from the devils for the research group, and performs procedures such as trial immunisations on the devils.

"Stanley", Richmond

Presentations, conferences and workshops 2019-20

Oral presentation: "Wild immunology, natural disease models and Tassie devils" at the Australian and New Zealand Council for the Care of Animals in Research and Teaching annual conference, and publication in the conference proceedings, Hobart, July 2019

Oral presentation: "Results of a devil facial tumour disease immunisation field trial; and MHC-I insights" at the Wildlife Disease Association Australasia annual conference, Tasmania, October 2019

Oral presentation: "Wildlife – assessment and treatment of injured wildlife in Tasmania" at the Tasmanian division of the Australian Veterinarian Association conference, and publication in the conference proceedings, Hobart, November 2019

Conference attendance: Ecological Society of Australia annual conference, Launceston, November 2019

Workshop attendance: Wild and Comparative Immunology (WACI) workshop, Hobart, November 2019

Publications 2019-20

Co-authorship: “Somatic evolution and global expansion of an ancient transmissible cancer lineage”; Baez-Ortega et al, published in the journal: Science, August 2019

Co-authorship: “Two of a kind: transmissible Schwann cell cancers in the endangered Tasmanian devil (*Sarcophilus harrisii*); Patchett et al, published in the journal: Cellular and Molecular Life Sciences, August 2019

Co authorship: “An oral bait vaccination approach for the Tasmanian devil facial tumor diseases”; Flies et al, published in the journal: Expert Review of Vaccine, January 2020

Co authorship: “Recurrent horizontal transfer identifies mitochondrial positive selection in a transmissible cancer”; Strakova et al, published in the journal: Nature Communications, June 2020

First author publication submission: “Post release immune responses of Tasmanian devils vaccinated with an experimental devil facial tumour disease vaccine” submitted to: Journal of Wildlife Diseases, August 2020

Plans for September 2020 onward

Commence the quoll comparative immunology project

Continue collaboration with the Australasian Genomics Wildlife Group, University of Sydney, particularly in regards to analysis of samples from devils with demonstrated immune recognition of DFTD

Complete the compilation and analysis of the DFT2 immunisation trial results, and prepare for publication.

Continue to work closely with members of the devil immunology group at Menzies – e.g. lab meeting participation; project discussions and facilitation

Continue care of and sample collection from the captive devils at Richmond

Continue to liaise with the Save the Tasmanian Devil Program and research collaborators (Dr E. Murchison and A. Strakova, Cambridge, UK; Dr H. Siddle, Southampton, UK; Dr C. Hogg, USyd; STDP; Dr R. Hamede, UTas) with respect to sample requirements, sample collection, sample analysis and research questions.