

Synthesis of Discussions of the Second Koala Retrovirus Workshop, 2021

ALEX D. GREENWOOD¹ , DAVID E. ALQUEZAR-PLANAS² , PHILIPPA A. MCKAY³ ,
BAPTISTE MULOT⁴ , GEOFFREY W. PYE⁵, AMY ROBBINS³ , CORA L. SINGLETON⁶ ,
RACHAEL E. TARLINTON⁷ , AND DAMIEN P. HIGGINS⁸ 

¹ Department of Wildlife Diseases, Leibniz Institute for Zoo and Wildlife Research, 10315 Berlin, Germany; and
School of Veterinary Medicine, Freie Universität Berlin, 14163 Berlin, Germany

² Australian Museum Research Institute, Australian Museum, Sydney NSW 2010, Australia

³ Endeavour Veterinary Ecology Pty Ltd, Toorbul QLD 4510, Australia

⁴ ZooParc de Beauval & Beauval Nature, 41110 Saint-Aignan, France

⁵ Disney's Animals, Science, and Environment, Bay Lake, FL 32830, United States of America

⁶ San Diego Zoo Wildlife Alliance, San Diego, California 92101, United States of America

⁷ School of Veterinary Medicine and Science University of Nottingham, United Kingdom

⁸ Sydney School of Veterinary Science, Faculty of Science, The University of Sydney NSW 2006, Australia

ABSTRACT. This document represents a synthesis of discussions held online at the Second Koala Retrovirus Workshop in 2021. The three days of discussions were based on workshop presentations and comprise: KoRV foundational science (Day 1); applied management of koalas in zoo populations (Day 2); and applied management of koalas in wild populations (Day 3). Each of these discussions gathers current knowledge, explores points of consensus and disagreement, and identifies important knowledge gaps. Recommendations arise regarding research strategy, interim measures for management, and support of research and management via initiation of working groups on KoRV diagnostics and biobanking.

Table of Contents

Synthesis of Discussions KoRV 2021 Workshop Day 1: Foundational Science	55
Goal	55
Day 1 talk titles	55
Topics discussed.....	56
(A) Updated overview of KoRV transmission dynamics.....	56
(B) Updated overview of KoRV infection and disease biology, degree of certainty of causation for:.....	58
Neoplasia.....	58
Chlamydiosis.....	59
Ill thrift and joey loss, bone marrow disease, other diseases in southern populations	60

Keywords: koala retrovirus, KoRV, koala, free living koalas, zoological gardens

Corresponding author: Alex D. Greenwood greenwood@izw-berlin.de

Received: 29 May 2023 **Accepted:** 29 May 2023 **Published:** 21 June 2023 (online only)

Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)

Citation: Greenwood, Alex D., David E. Alquezar-Planas, Philippa A. McKay, Baptiste Mulot, Geoffrey W. Pye, Amy Robbins, Cora L. Singleton, Rachael E. Tarlinton, and Damien P. Higgins. 2023. 2023. Synthesis of discussions of the Second Koala Retrovirus Workshop, 2021. In *Proceedings of the Second Koala Retrovirus Workshop*, ed. D. E. Alquezar-Planas, D. P. Higgins, C. L. Singleton, and A. D. Greenwood. *Technical Reports of the Australian Museum Online* 38: 53–82. <https://doi.org/10.3853/j.1835-4211.38.2023.1842>

Copyright: © 2023 Greenwood, Alquezar-Planas, McKay, Mulot, Pye, Robbins, Singleton, Tarlinton, Higgins. This is an open access article licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original authors and source are credited.



Table of Contents (continued)

Ill-thrift and joey loss	60
Bone marrow disease.....	60
Other diseases.....	60
(C) Updated KoRV and koala genomics.....	60
(D) Current state of anti-KoRV processes, natural and developed.....	61
(E) Overview of KoRV diagnostics	61
(F) Overview on therapeutic control.....	61
(G) Origins of KoRV	62
 Synthesis of Discussions KoRV 2021 Workshop Day 2: Applied Management—Zoo Populations 63	
Goals	63
Day 2 talk titles	63
Topics discussed.....	63
(A) Recap Day 1 foundational science discussion.....	63
(B) Understanding of KoRV status for management: underlying principles.....	64
(C) Testing considerations	66
(D) Breeding decisions.....	68
(E) Northern-southern hybridization	69
(F) International transfers.....	70
(G) Role of stress and movement in KoRV infection and disease expression.....	72
(H) Treatment: anti-retrovirals	73
(I) Gammaherpesviruses.....	73
(J) Biobanking	73
References	75
 Synthesis of Discussions KoRV 2021 Workshop Day 3: Applied Management—Wild Populations .. 76	
Goals	76
Topics discussed.....	76
(A) Background to management of free-ranging koalas.....	76
(B) Consensus on risk posed by KoRV to wild populations	77
Southern populations	77
Northern populations	77
Mechanisms/evidence for KoRV role in disease.....	78
(C) Consensus on principles for management	78
Free-ranging populations	78
Exogenous KoRV transmission during transport / stress events	78
(D) Diagnostics and screening.....	79
Southern populations	79
Northern populations	79
(E) Research strategy over the next 5–10 years.....	80
Biobanking and collaboration.....	81
Acknowledgements	82
ORCID iD of authors and contributors	82