

PhD Dissertation
Department of Environmental Science and Policy
College of Science
George Mason University

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Title: Multi-omic health profiling in the critically endangered black rhinoceros (*Diceros bicornis*)

Dissertation Directors: Dr. Emanuel Petricoin III, Dr. Budhan Pukazhenth

Committee: Dr. A. Alonso Aguirre, Dr. Keith Crandall, Dr. Jennifer Salerno

ABSTRACT

Black rhinoceros (*Diceros bicornis*) experience extinction threats *in-situ* because of poaching pressures. Simultaneously, the *ex-situ* population, which serves as a genetic reservoir against impending extinction threats, experiences its own threats to survival related to several disease syndromes not typically observed among their wild counterparts. The physiological mechanisms that underpin these syndromes are not fully understood. We employed the use of multiomic profiling: metabolomic, immunoproteomic, metagenomic, and dietary metataxonomic datasets to identify the physiological pathways that appear perturbed in animals with disease phenotypes. We hope these findings will improve the overall health and wellbeing of black rhinos in managed care.