A case for physiological metrics in the management and prevention of reptile invasions

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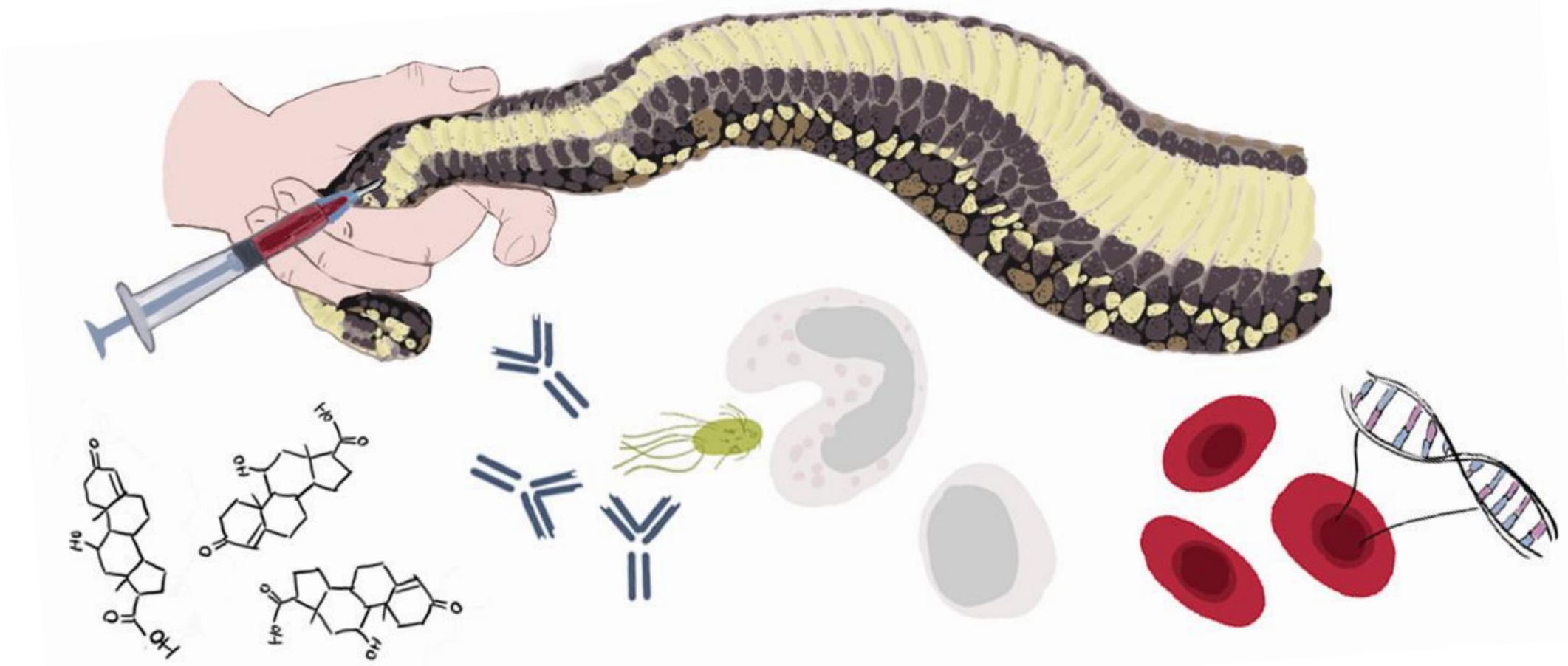
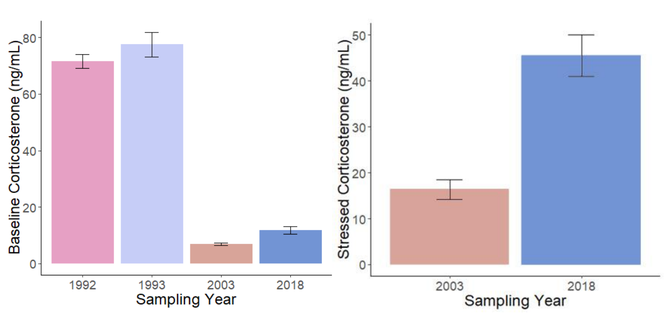
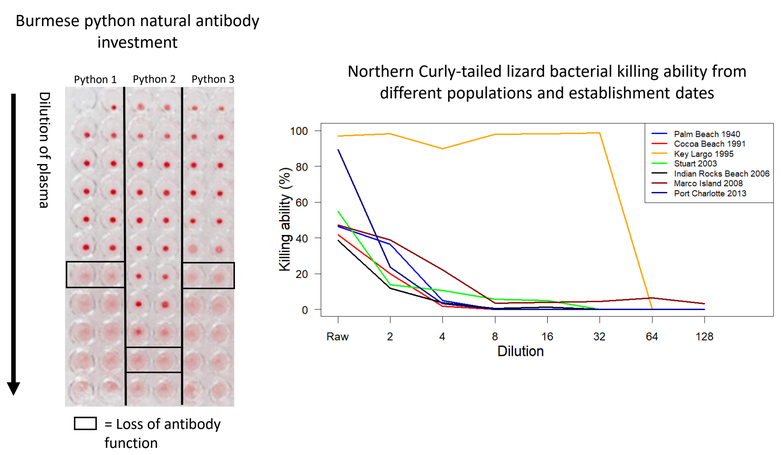


	Hormones	Immune Responses	Gene Expression
Function	Regulate many functions such as reproduction and immune function Induce behavioral changes Corticosterone : stress, sleep/wake, anti-inflammatory	Innate: generalized response to new pathogens, but self-damage by inflammation Humoral: specific antibodies are increased after several encounters with new pathogens Cellular: different circulating cell types indicate ongoing infection and capacity to respond to new pathogens	Demonstrates relatedness between individuals and among species Blueprint for bodily functions Expression of traits can change during an individual's lifetime, especially after a stressful event
Invasive Species	May have distinct hormonal responses after transport stress, at different stages during invasion May exhibit reproductive hormonal patterns distinct from captivity or native range	Have left many native-range pathogens behind, and are less at risk of developing harmful disease, but more at risk of over-reacting when encountering new substances (similar to an allergy) May shunt energy from immune function towards reproduction or dispersal	May have separate introduction histories, and mixing of different native range genotypes in the invaded range Do not always represent the native range phenotypes Might have altered gene expression as a result of transport stress
Applications	Brown treesnakes on Guam show different levels of the stress hormone corticosterone over time, may indicate depletion of local resources 	Populations and individuals of the same species of invader have different investment in immune responses, but more research is needed to understand these patterns 	The origin of a species and subsequent mixture of genotypes may impact its phenotypes and thus ability to sustain a population in the invaded range