

# Lessons Learned from the Old and New World: Exploring the Interplay between Biodiversity and Zoonotic Diseases in Wildlife

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Understanding the relationships between biodiversity and zoonotic diseases is crucial for safeguarding human and animal health. We investigated the diversity-disease relationships using bat communities exposed to coronaviruses (Ghana) and placental and marsupial mammal communities exposed to Trypanosoma infections (Panama) as study systems. Using spatiotemporal variations in species community assemblages, we revealed in both settings and study systems that anthropogenic disturbances and subsequent biodiversity loss are reshaping species communities, favoring the proliferation of generalist species that act as main reservoirs for pathogens. As a consequence, infection probability and prevalence increased in less diverse species assemblages that are dominated by susceptible hosts. In Ghanaian bats, we were able to distinguish between taxa that amplify or reduce coronavirus infection likelihood. In Panama, we found that Trypanosoma infection likelihood was primarily associated with marsupial density in relation to human disturbance. Combined, both host-pathogen systems highlight aspects of diversity-disease relationships compatible with the dilution effect hypothesis. Overall, our findings emphasize the urgent need to prioritize conservation efforts that maintain healthy and resilient ecosystems to mitigate the risks associated with zoonotic disease transmission.

## Keywords

species diversity, host community composition, dilution effect, anthropogenic disturbance, coronavirus, Trypanosoma, Ghana, Panama

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## Professional Status of the Speaker

Postdoc

## Junior Scientist Status

No, I am not a Junior Scientist.

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