

Timing the diversification of a mammal parasite, *Bartonella*

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Problem

Most human infections likely came from animals
When did these transitions from animals to humans occur?

Background

Bartonella bacteria cause several human diseases
Related animals have related *Bartonella* strains
Bartonella infects blood cells and is carried by insects

Goal

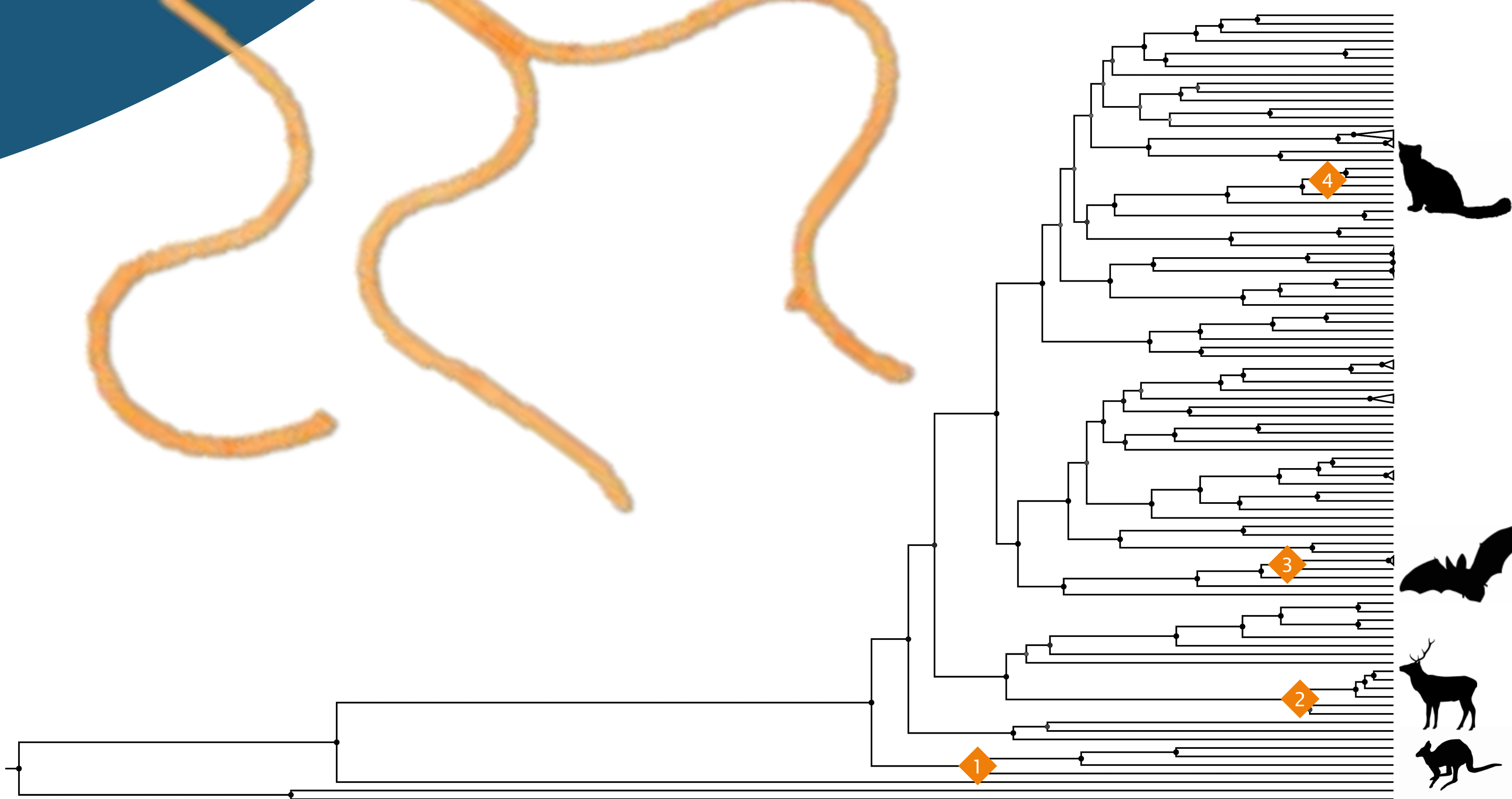
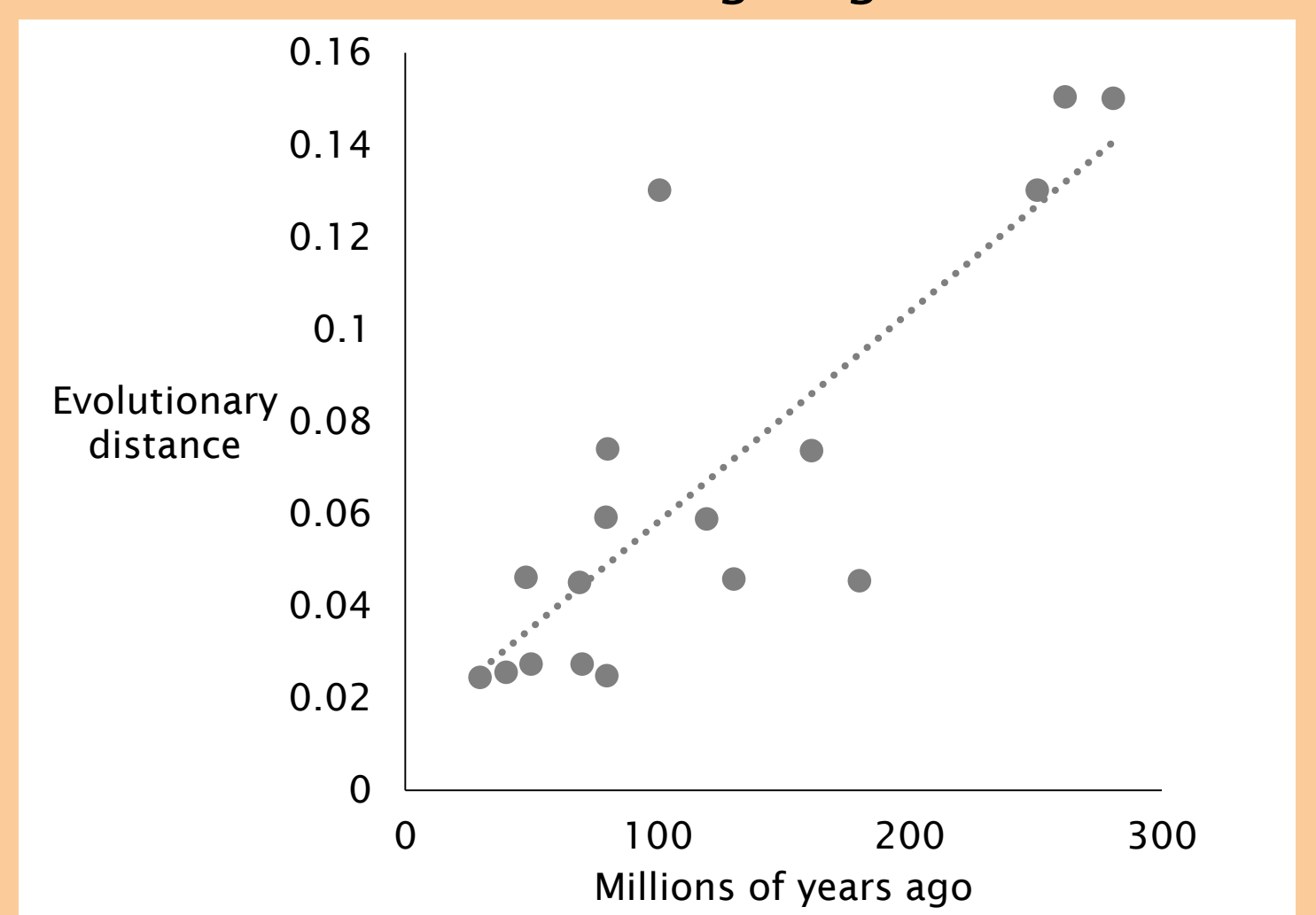
Estimate when *Bartonella* evolved
Time the origin of human infections

Methods

Assemble genetic data
Known *Bartonella* species
New strains from bats

Calibrate molecular clock

Genetic material changes at some rate
Rate is flexible over time
Average rate set from host-specific bacteria
'Tune' clock using origins of animal hosts



Results/Conclusions

Bartonella is much older than we knew!
Bartonella started as gut bacteria in insects
Bartonella diversified with mammals starting ~100 million years ago
Monkey and human *B. quintana* (cause of trench fever) split 2 million years ago



Diversification of mammals

Cretaceous-Paleogene extinction of dinosaurs

