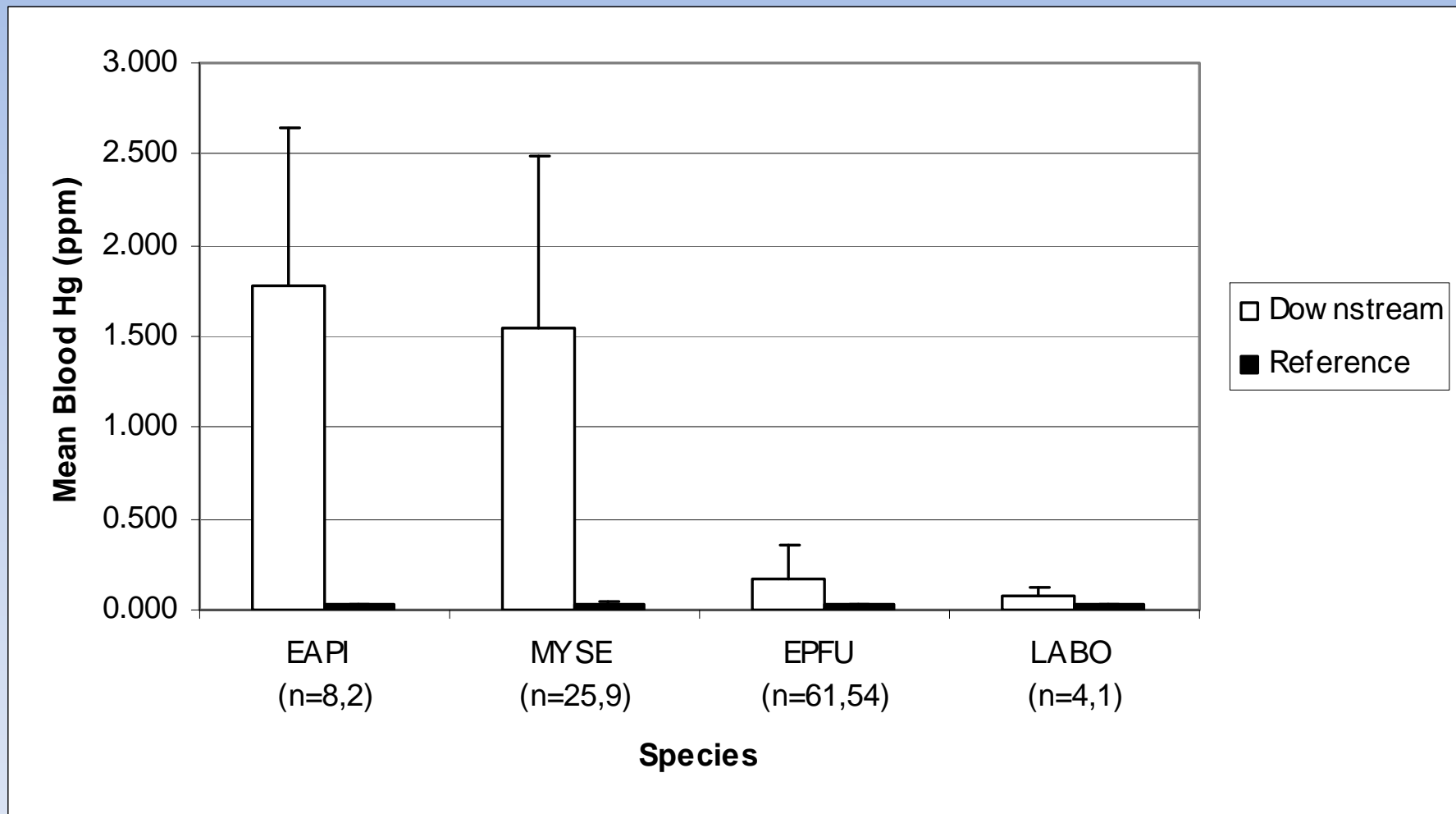


Assessment of immune function response to Little Brown bats on the South River, Virginia - 2008

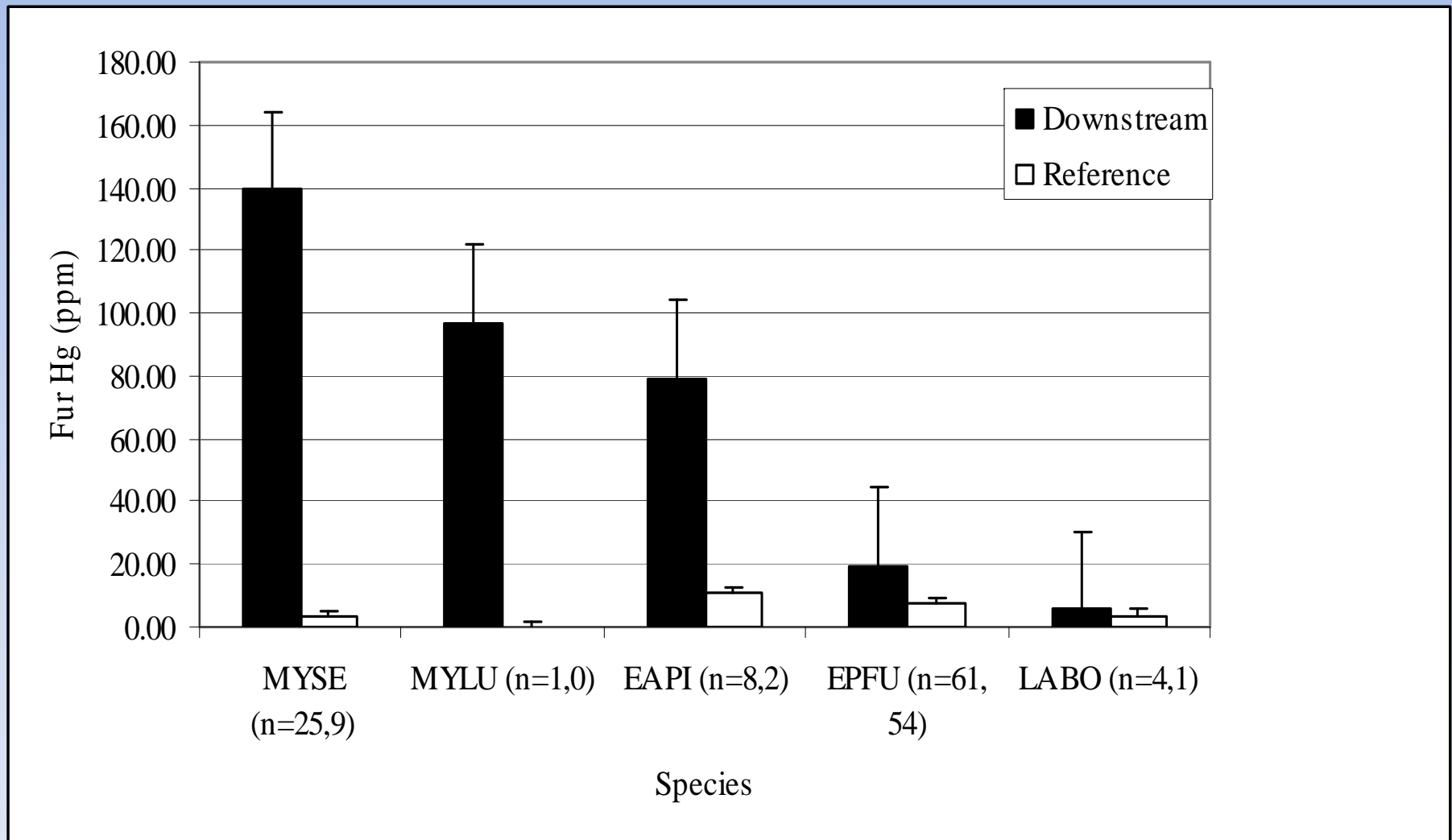
Dave Yates¹, Marianne Moore², David Evers¹ and Tom Kunz²
BioDiversity Research Institute¹
Boston University²



What we know?



What we know?



Objectives

1. Focus on species of bats with the highest Hg levels (Eastern Pipistrelle, Northern long-eared, and Little Brown);
2. Capture bats at sites with highest Hg loads and use telemetry equipment to track bats to maternity roosts;
3. Use biomarker tests on bats at maternity roosts between downstream and reference Hg sites;
4. Capture 30-35 adult female bats from reference and downstream areas at two different reproductive stages: pregnant and post lactating;
5. Capture 30-35 juvenile female bats from reference and downstream bats
6. Use stable isotope signatures of food web to determine dietary emphasis, trophic level, and percent use of aquatic-based prey items.

Capture Methods



Mist Nets



Radio Telemetry



Radio Telemetry



Bat Colony Locations



Bat Colony Locations



Bat Colony Locations



Bat Colony Locations



Bat Colony Locations



Harp Trapping Maternity Colonies



Bat Colonies



Mother and Son



Tissue Sample



Blood Sample



Fur Sample



Samples Collected

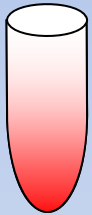
<u>Location/Samples</u>	<u>BKA</u>	<u>PHA</u>	<u>Genotox.</u>	<u>Isotope</u>	<u>Blood</u>	<u>Fur</u>
Crawford Vent Ref	13	13	13	13	13	13
Moscow Barn Ref	117	117	117	117	117	117
Rankin Barn RM 17	51	51	51	51	51	51
Craig Barn RM 22	75	75	75	75	75	75
Total	256	256	256	256	256	256

Methods: relative immune function

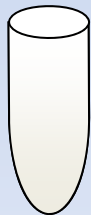
Bactericidal assay (Tielman et al., 2005):

- uses known concentrations of whole blood and *E. coli*, mixed, incubated and spread on agar plates
- tests relative strength of innate immune function

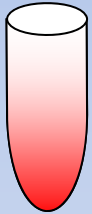
diluted blood, 1:500



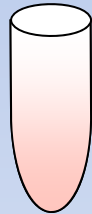
diluted *E. coli*, 1:1000



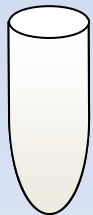
diluted blood, 1:500



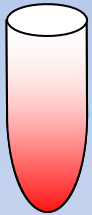
blood/bacteria, 1:10



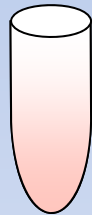
diluted *E. coli*, 1:1000



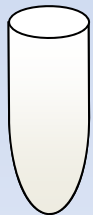
diluted blood, 1:500



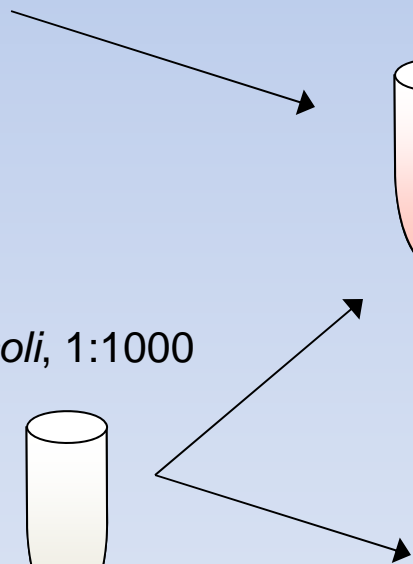
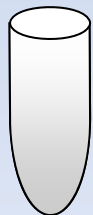
blood/bacteria, 1:10



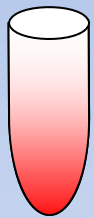
diluted *E. coli*, 1:1000



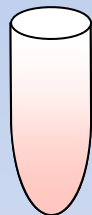
control



diluted blood, 1:500



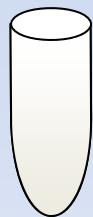
blood/bacteria, 1:10



0 min blood/bacteria



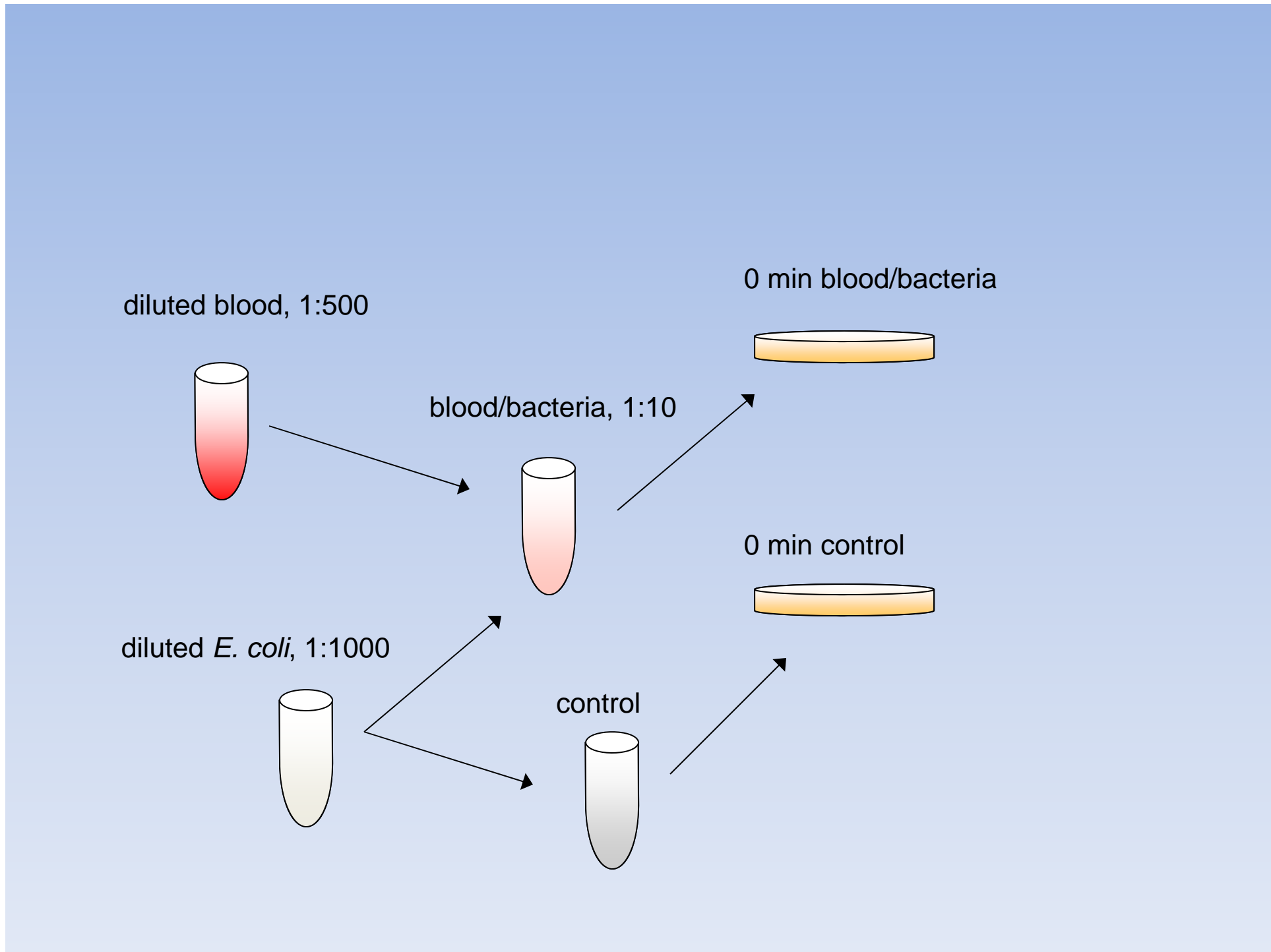
diluted *E. coli*, 1:1000



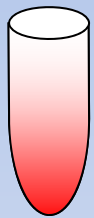
control



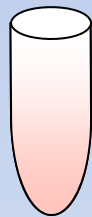
0 min control



diluted blood, 1:500



blood/bacteria, 1:10



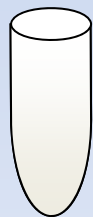
0 min blood/bacteria



60 min blood/bacteria



diluted *E. coli*, 1:1000



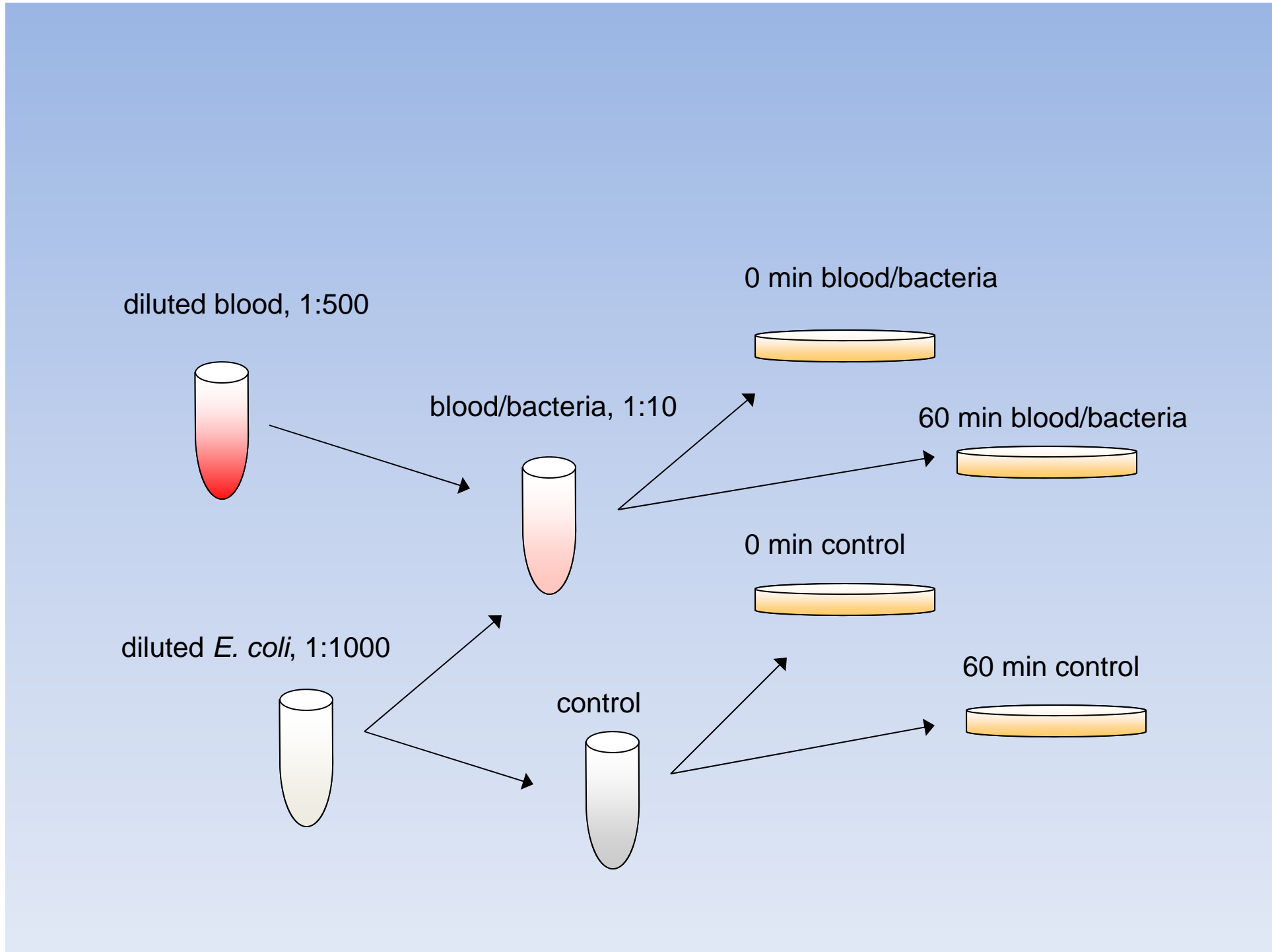
control



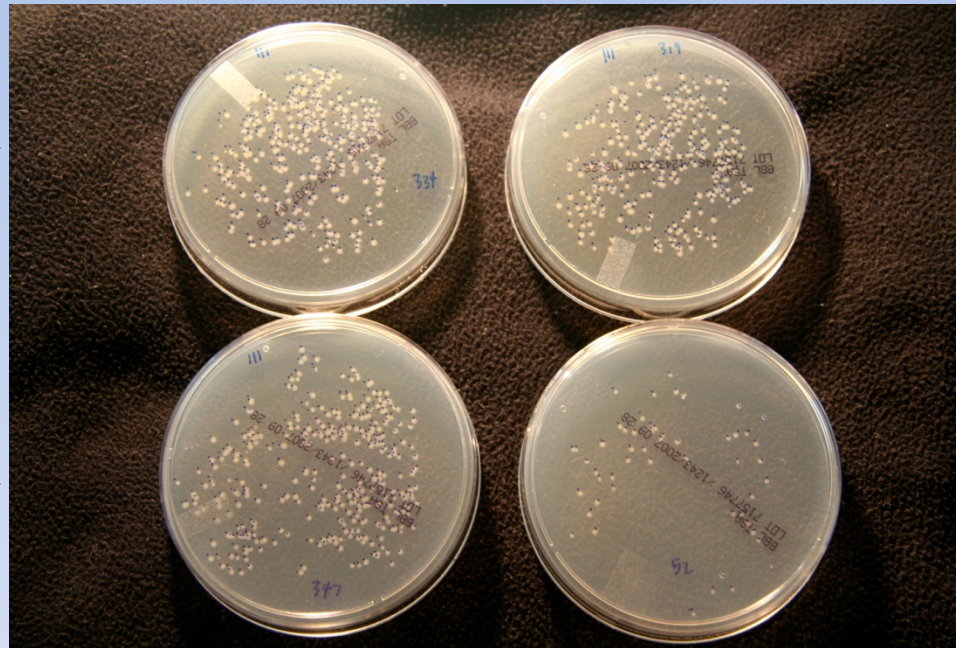
0 min control



60 min control



0 min control



60 min control



0 min exp



60 min exp



Bactericidal ability = % change experimental - % change control

Methods: relative immune function

Phytohemagglutinin (PHA):
challenges innate and adaptive responses
through inflammation & T-lymphocyte
proliferation

subcutaneous injections

response measured at 10 hours post-
injection

$$\text{Index} = \frac{\text{postPHA} - \text{postPBS}}{(\text{prePHA} + \text{prePBS})/2}$$



Brain Receptor Assay

- Collected 30 (15 ref., 15 downstream) adult little brown bats and sent the brains, fur, and blood to University of Michigan (Nil Basu)
- Analyze tissues for Hg
- Examine brains for changes in receptor responses

Crew



Acknowledgements

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