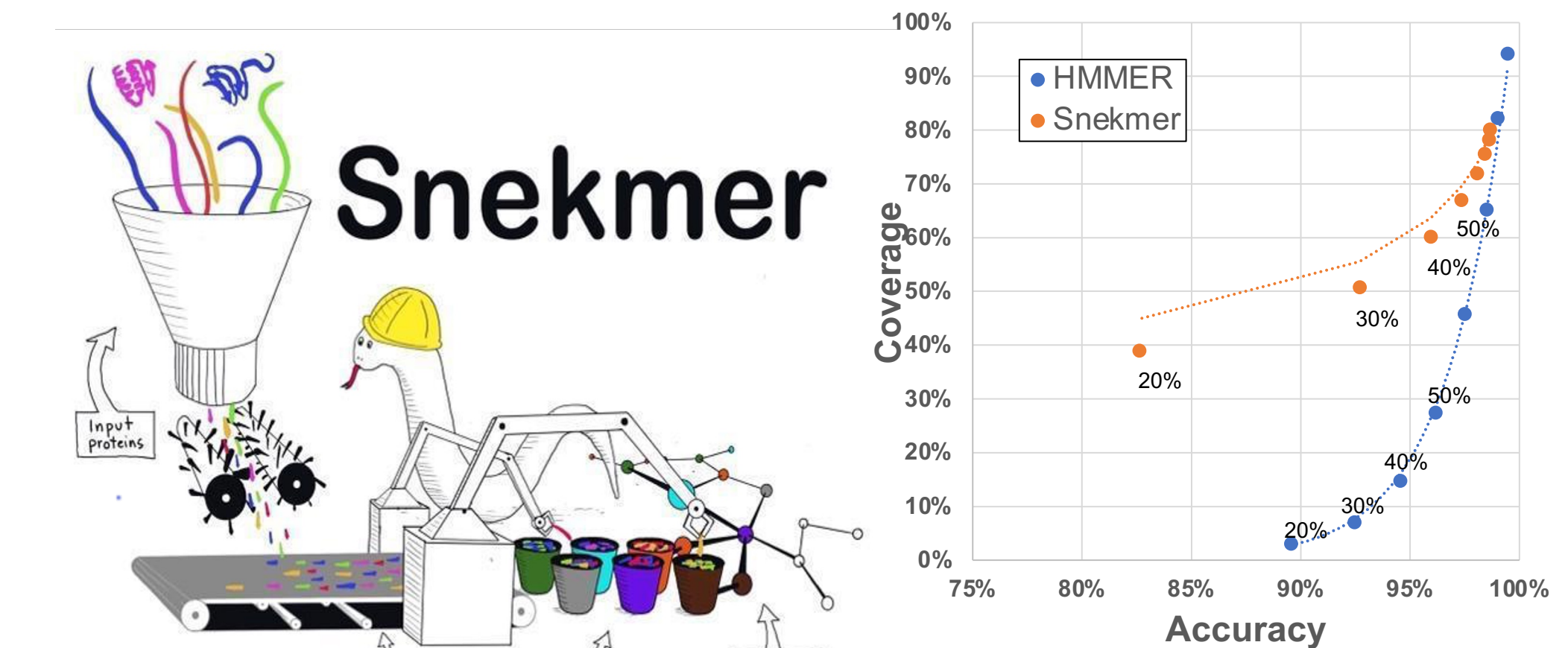
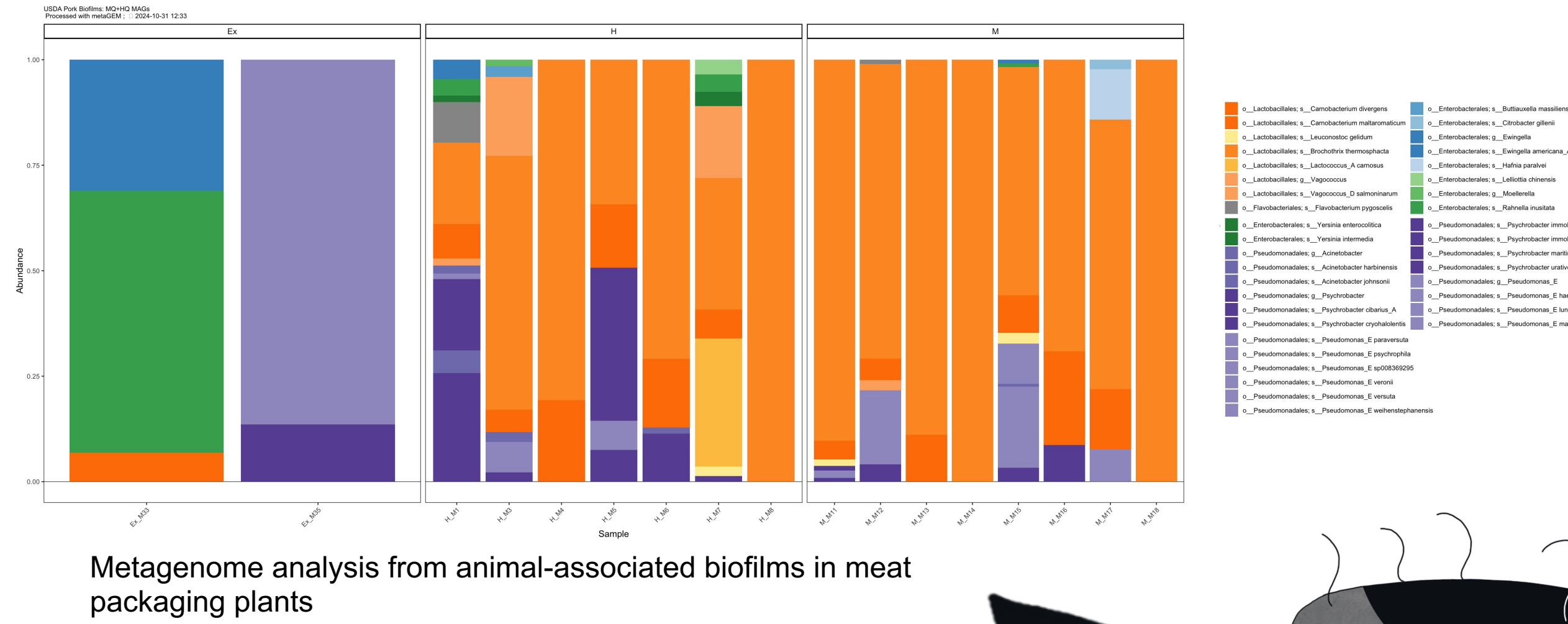


Enhancing Community Metabolic Modeling in Biofilms for One Health

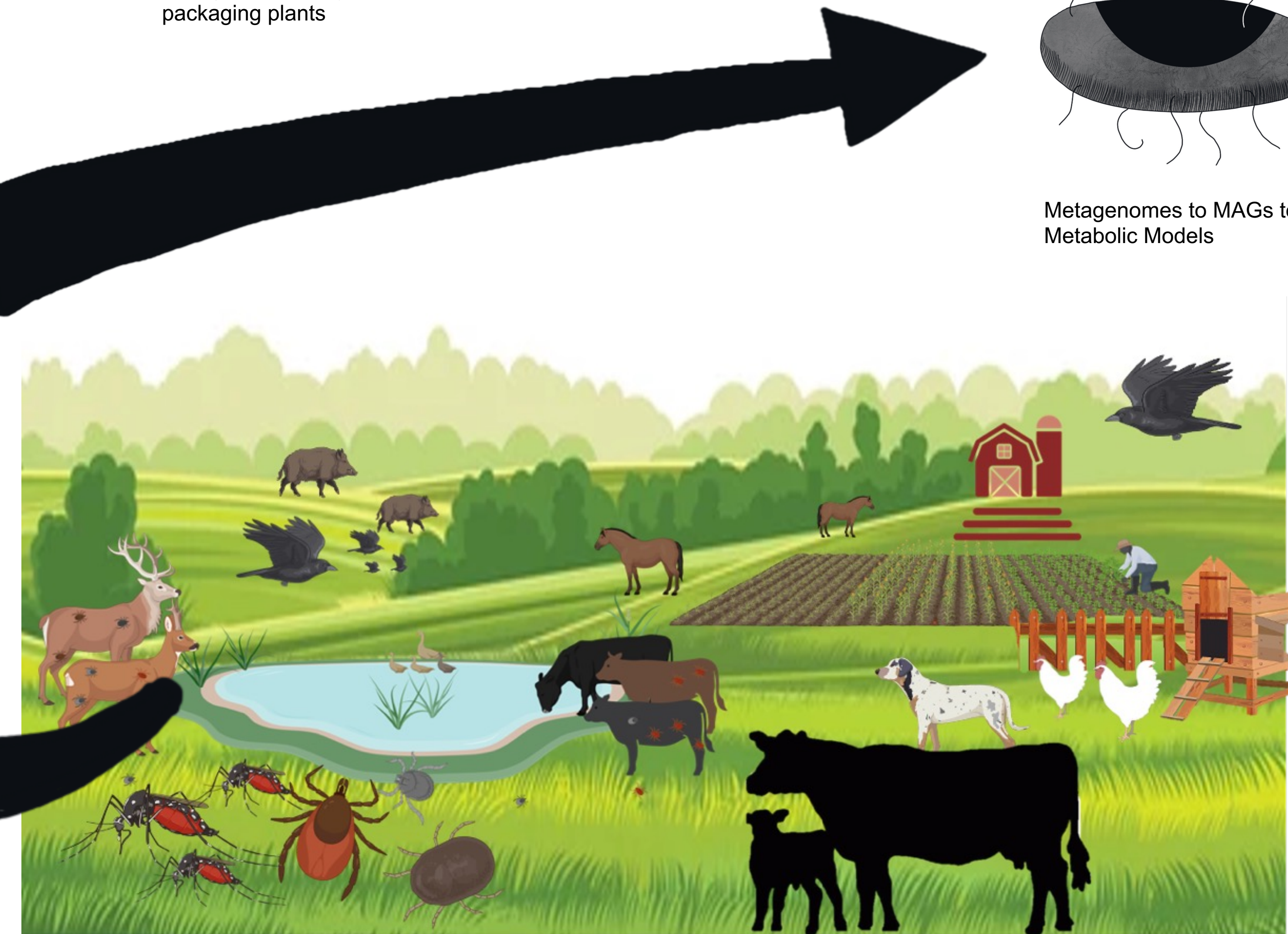
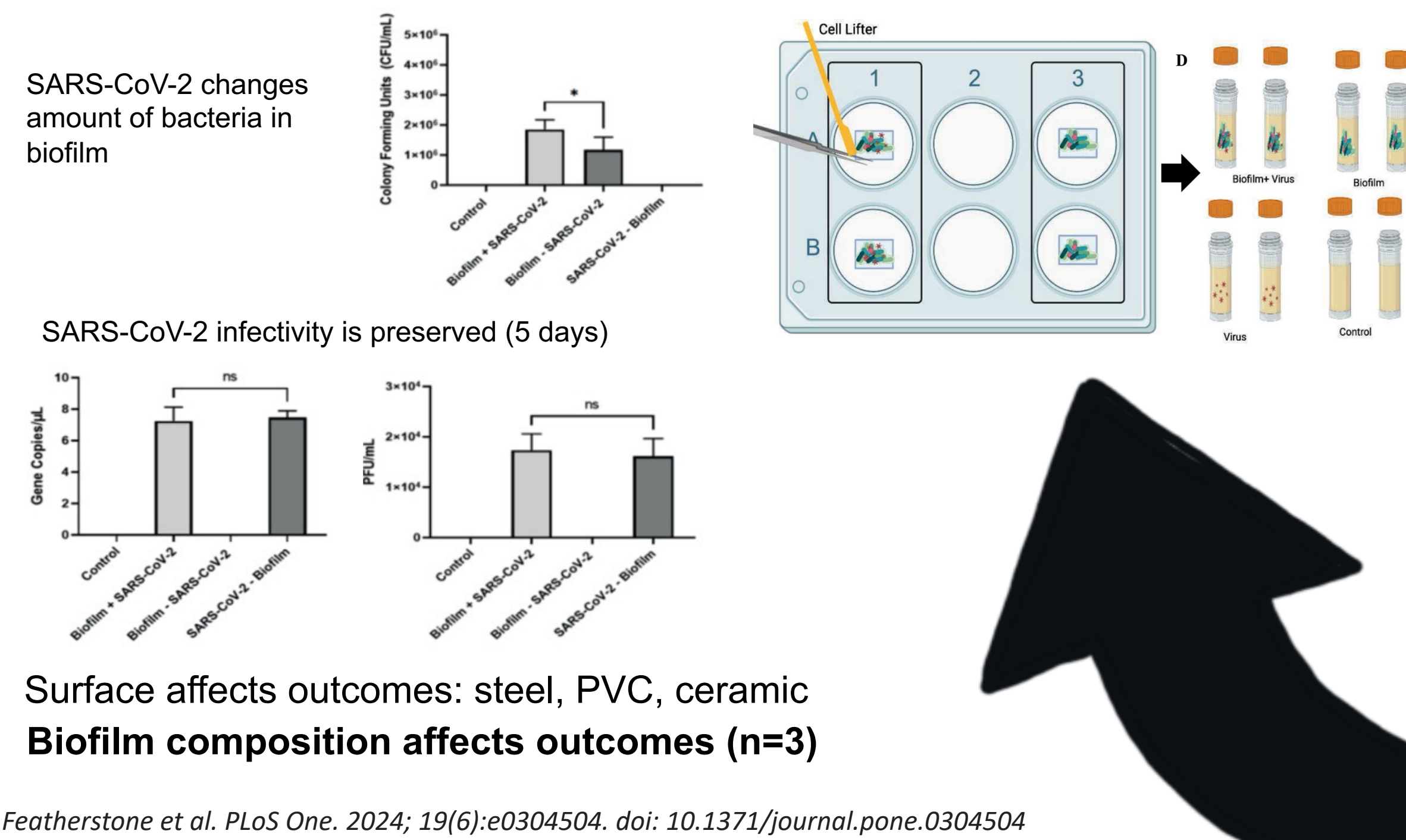
Jason McDermott (PNNL), Sapna Dass (TAMU), Sneha Couvillion (PNNL), Vignesh Palanisamy (TAMU), Makenzie Newton (TAMU), Winston Anthony (PNNL), Tara Nitka (PNNL), Amy Zimmerman (PNNL), Carrie Nicora (PNNL), William Nelson (PNNL)

Key Questions:

1. How does biofilm function respond to SARS-CoV-2 presence at the molecular level?
2. How does the biofilm response change over time?
3. How does biofilm composition impact function as a reservoir?
4. How can we improve the function of metabolic models using computational approaches and omics data?

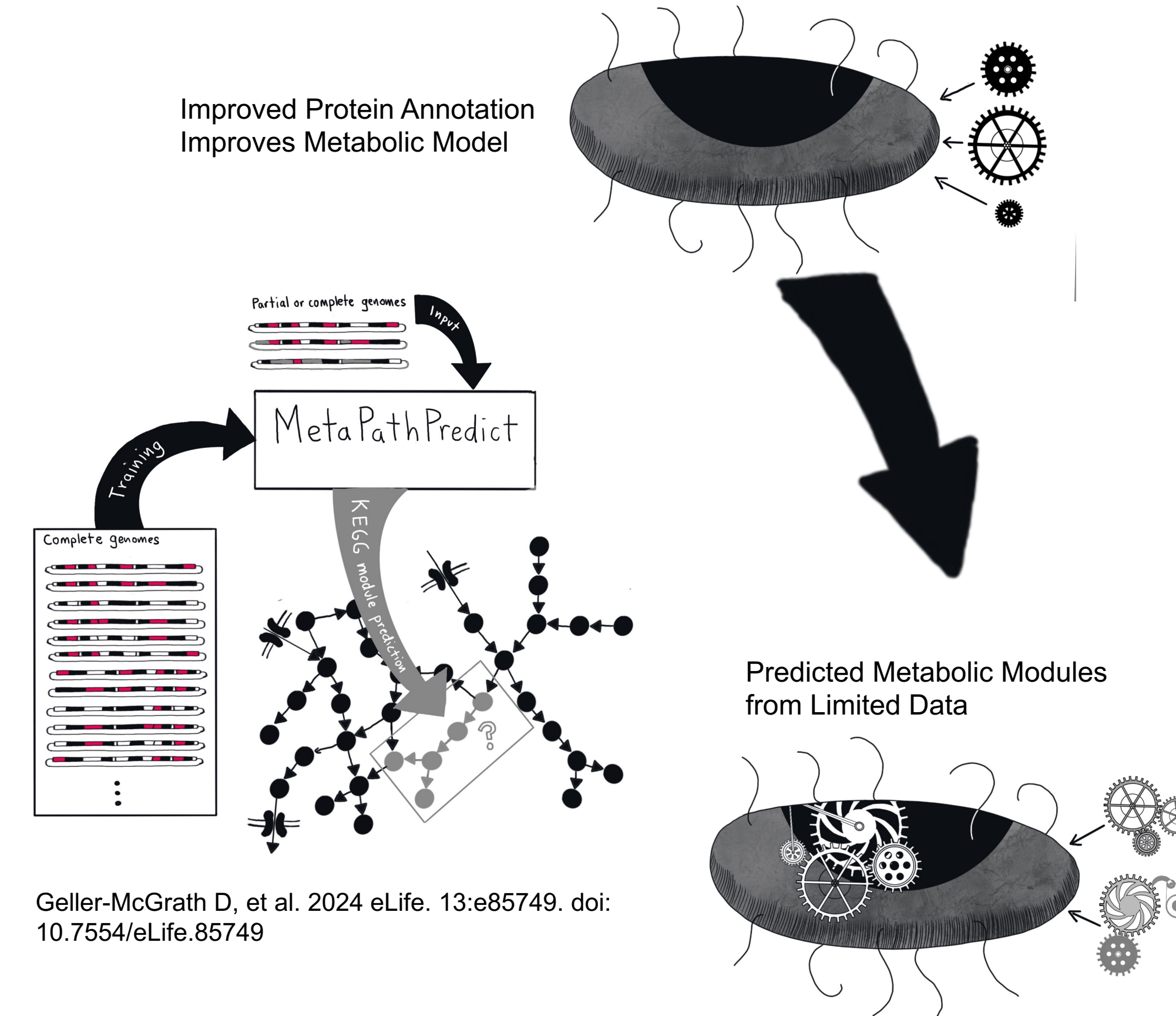


Biofilms as an Environmental Reservoir for SARS-CoV-2

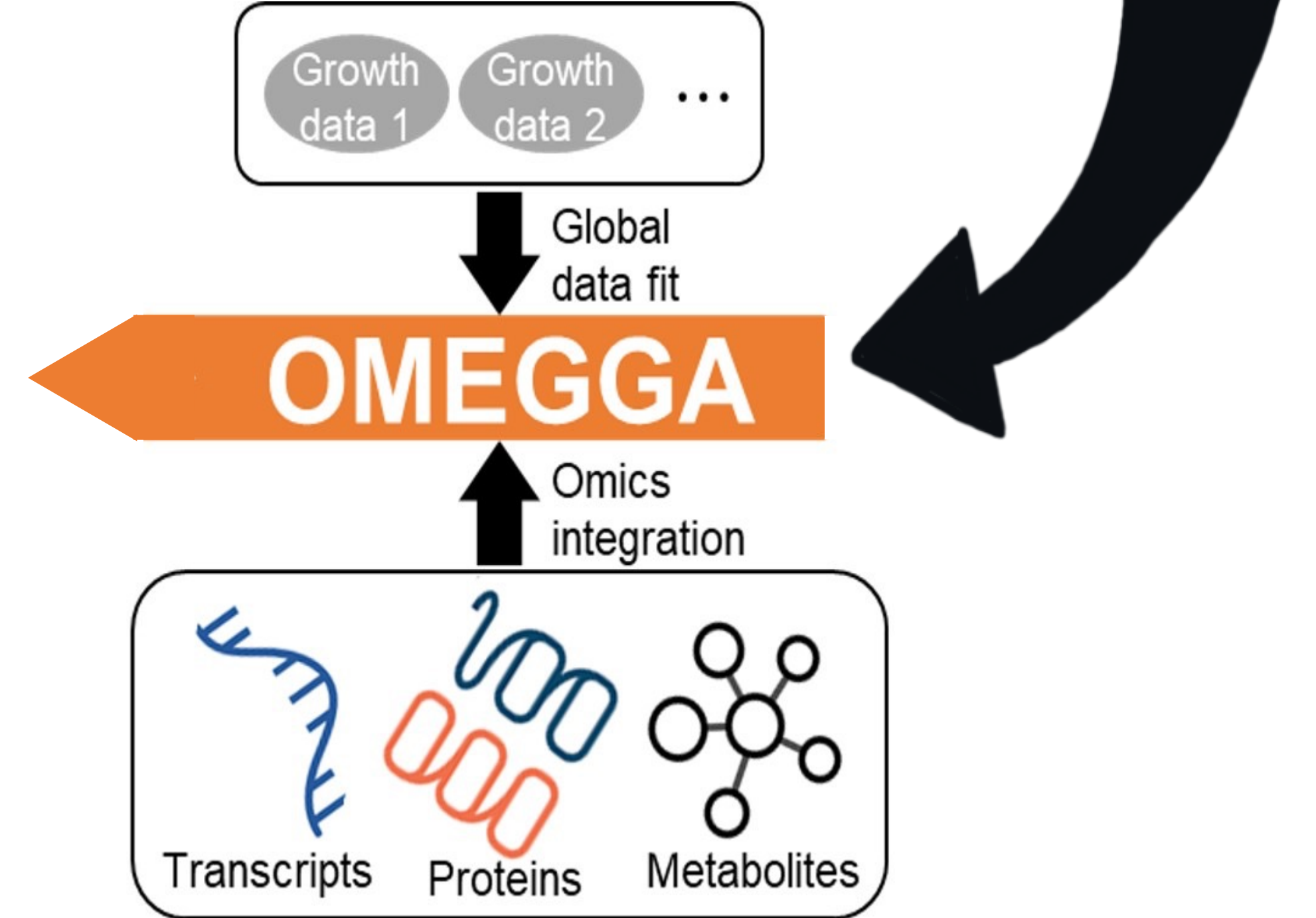
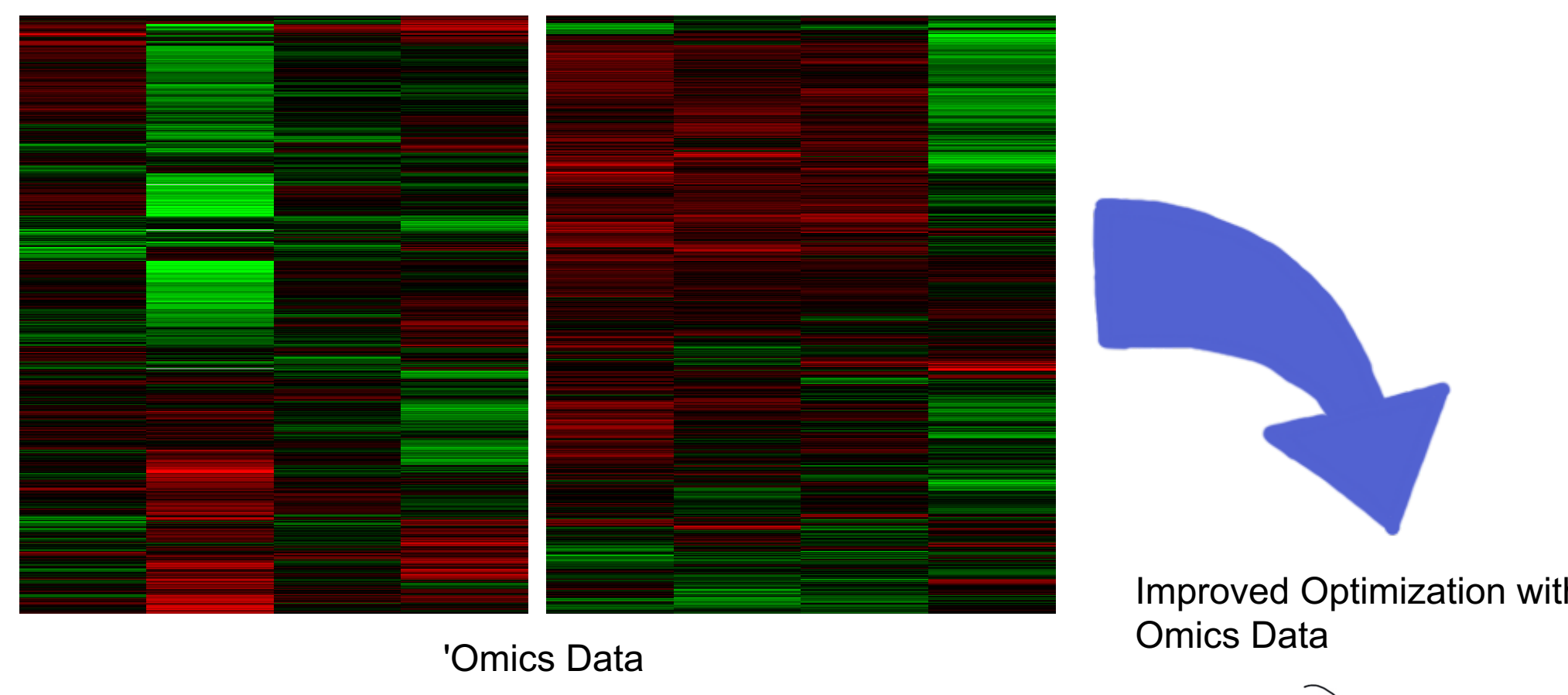
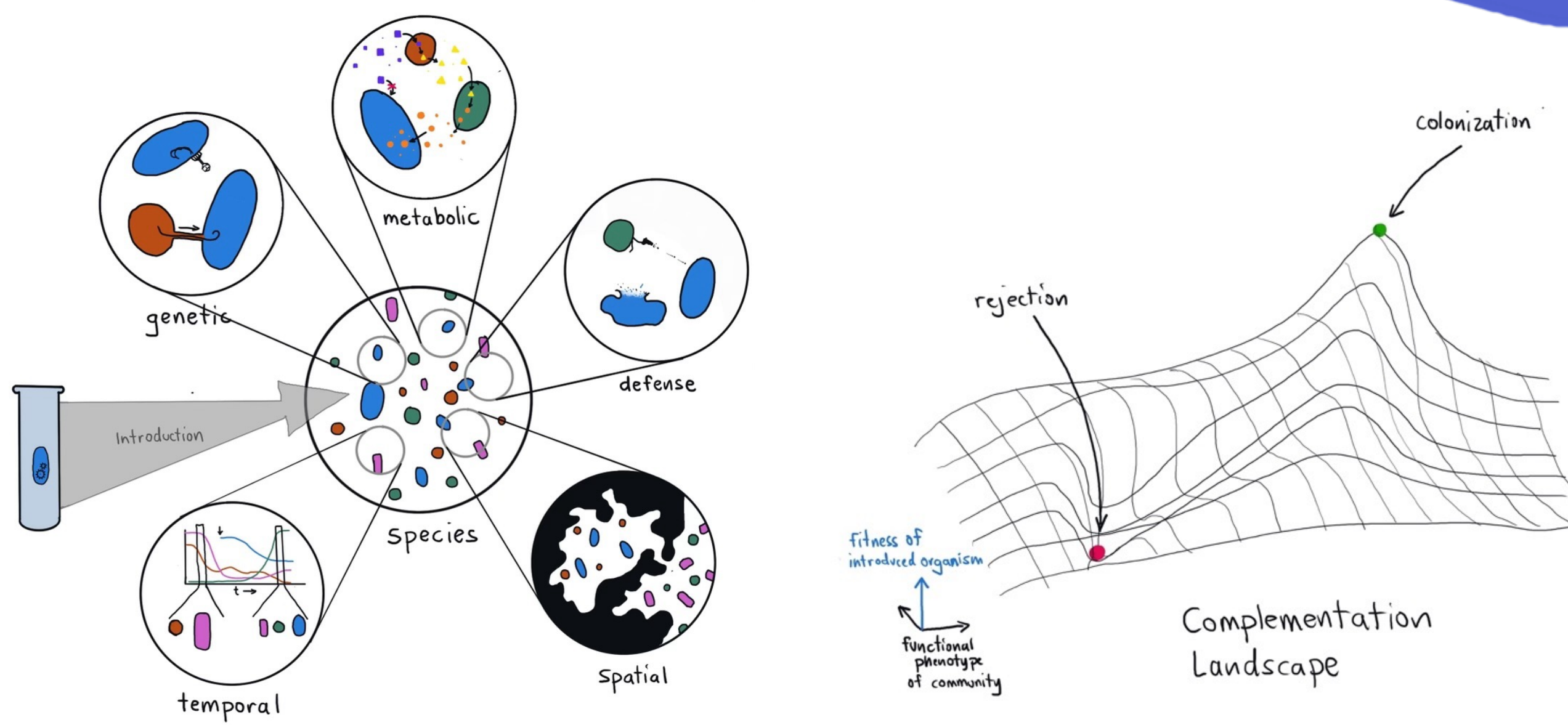


- Faster (much) than HMMER
- Accuracy is comparable
- Improved performance on protein fragments
- Better coverage for some important functions

Chang, C. H.; et al., Bioinform Adv 2023, 3, vbad005



Understanding the Persistence Landscape of Animal-associated Biofilms



Expected Outcomes:

- Improved understanding of metabolic function
- Metabolic exchange
- Interaction of SARS-CoV-2 with community

For additional information, contact:
Jason McDermott | Jason.McDermott@pnnl.gov

Zoonosis
Definition: a disease that normally exists in animals but that can infect humans
Examples: rabies, salmonella, influenza, many more

Zoo noses
Definition: funny masks you buy at the zoo gift shop
Examples: beer sloth, hot walked male rat

@redpenblackpen

Funding sources
USDA-APHIS: "A systems approach to understanding farm animal-environmental drivers of SARS-CoV-2 transmission in the food supply chain", Sapna Dass PI

DOE BER: "Persistence Control of Engineered Functions in Complex Soil Microbiomes." SFA Robert Egbert, PI

DOE BER: "Phenotypic response of the soil microbiome to environmental perturbations." SFA Kirsten Hofmocker, PI

DOE BER: "Omics-enabled global gapfilling (OMEGGA) for phenotype-consistent metabolic network reconstruction of microorganisms and communities" KBase Supplement, Kirsten Hofmocker, PI

DOE BER: "Improved Protein Annotation in KBase Using Machine Learning, Multi-Omics Data Integration, and Structural Prediction", KBase Supplement, Bill Nelson, PI