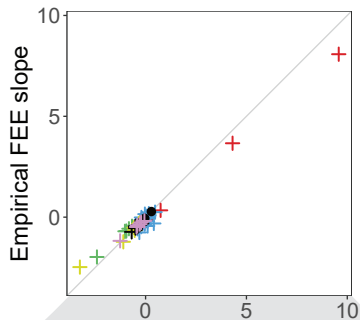


Effective interaction
averaged across backgrounds

$$\tilde{\varepsilon}_{ij} = \frac{\langle \varepsilon_{ij} \rangle \langle \Delta F_{j/B(i)} \rangle}{\sum_{k \neq i} \langle \Delta F_k \rangle_{B(i)}^2}$$



Ecological data sets:

- + Above-ground plant biomass
- + Phytoplankton biomass
- + Bacterial xylose oxidation
- + Bacterial starch hydrolysis
- + Bacterial butyrate secretion
- + Bacterial pyoverdine secretion

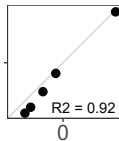
Genetic data set:

- *E. coli* fitness

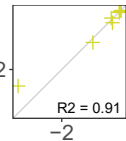
FEE slope
expected from averaged interactions, $b_i \approx \sum_{j \neq i} \tilde{\varepsilon}_{ij}$

Empirical
FEE slope

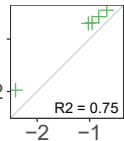
E. coli fitness



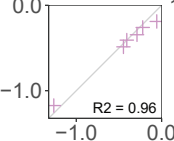
Above-ground
plant biomass



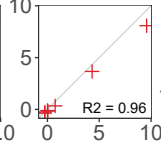
Phytoplankton
biomass



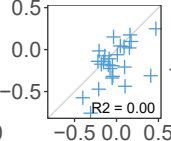
Bacterial
xylose
oxidation



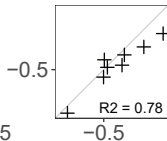
Bacterial
starch
hydrolysis



Bacterial
butyrate
secretion



Bacterial
pyoverdine
secretion



FEE slope
expected from averaged interactions, $b_i \approx \sum_{j \neq i} \tilde{\varepsilon}_{ij}$