



The effect of infection with *P. infestans* on the potato microbiome

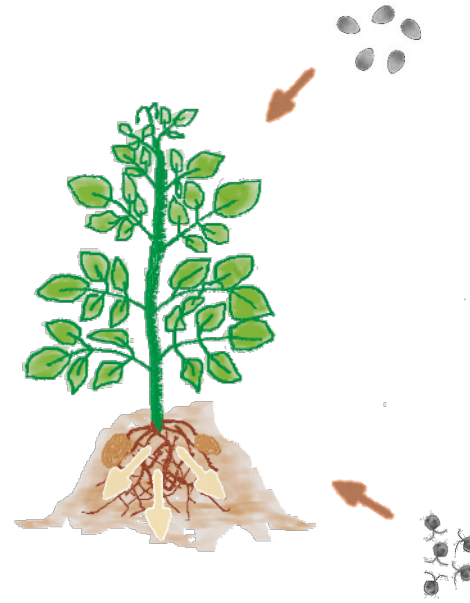
Challenging potatoes to find
effective biocontrol agents

Can potato plants
recruit beneficial
microorganisms
upon pathogen
infection?



SELECTION BY THE PLANT

The cry for help hypothesis



Attack by pest or pathogen



Changes in root exudation profiles

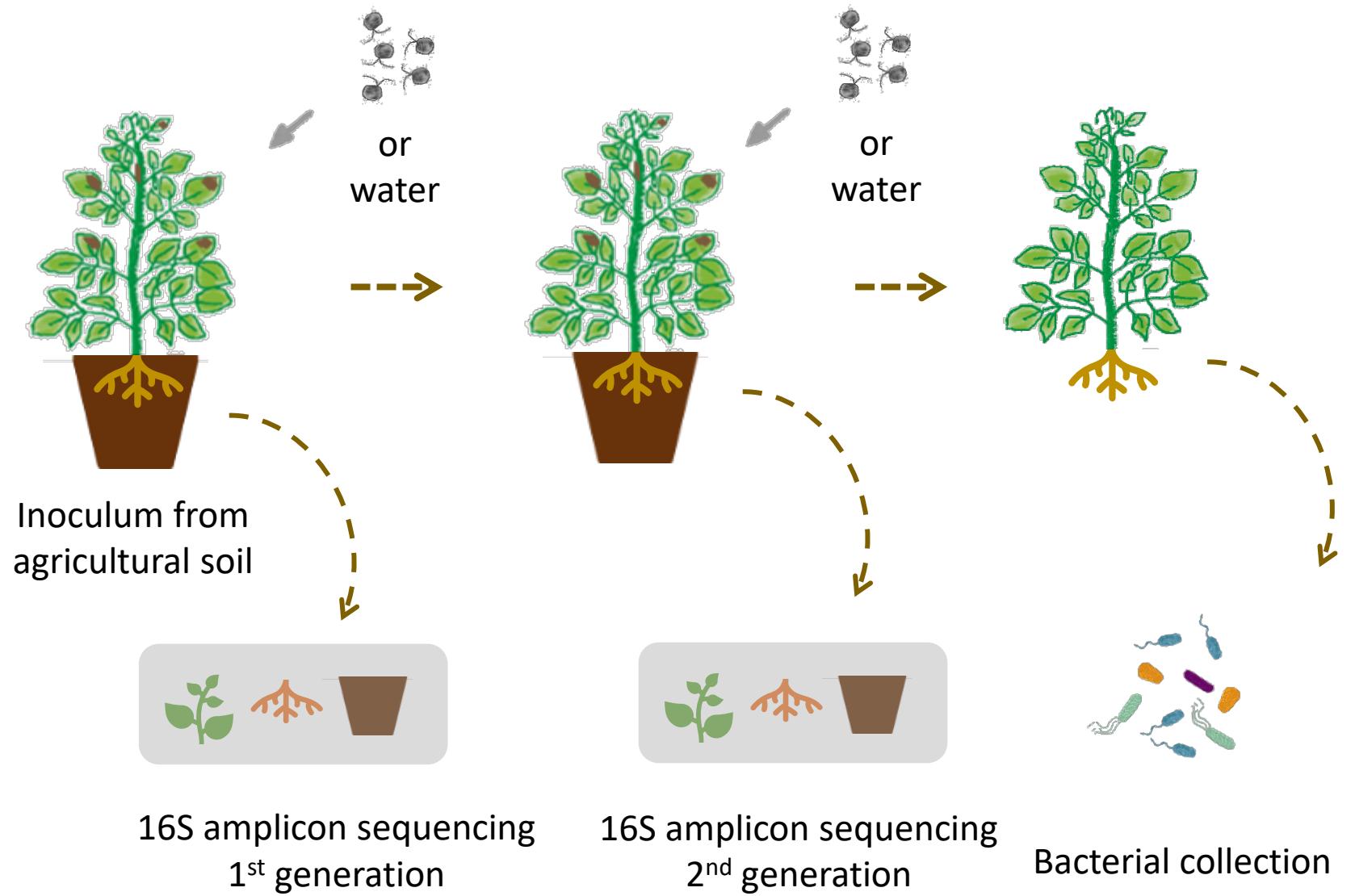


Selection/recruitment of beneficial microorganisms



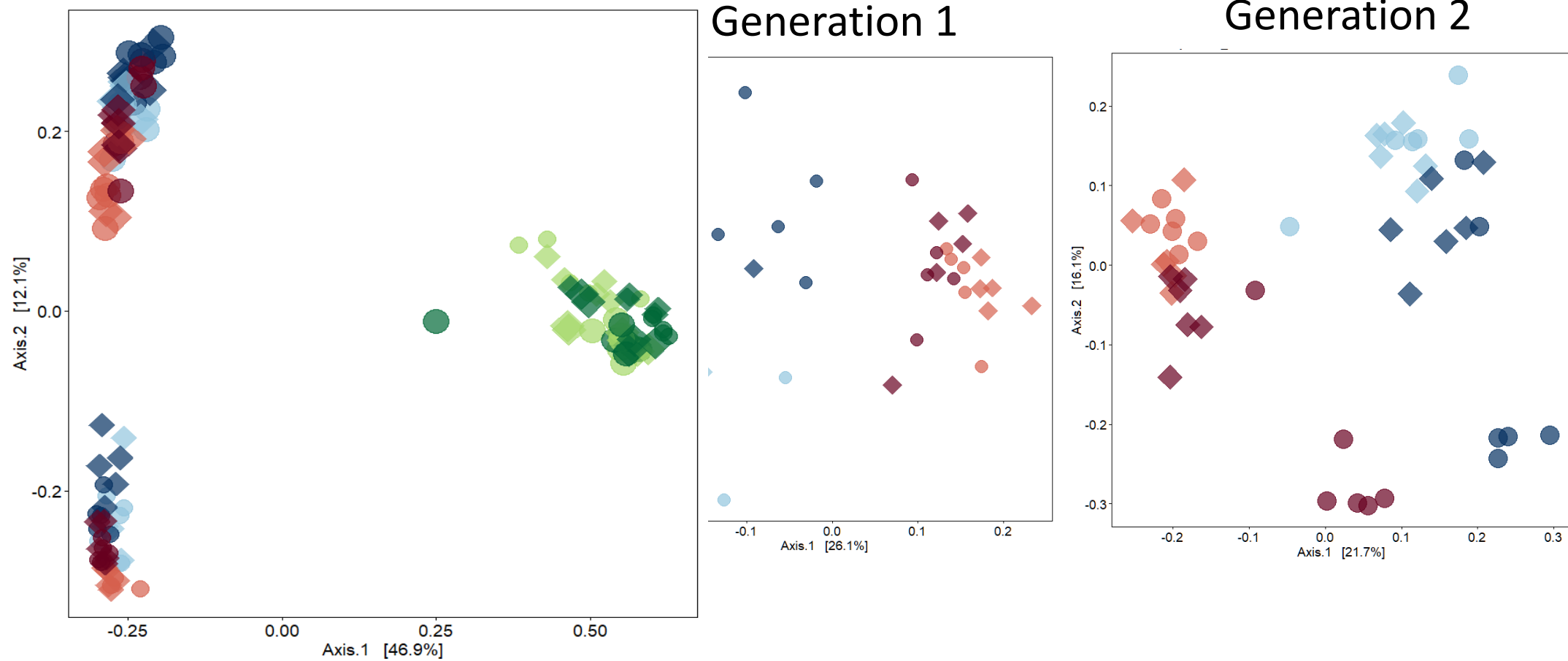
THE GOOD GUYS

THE EXPERIMENT

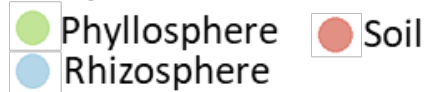


Bintje & Innovator

Changes in community composition



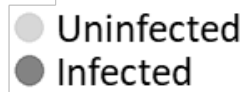
Compartment



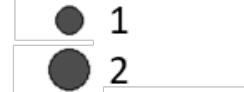
Cultivar



Treatment

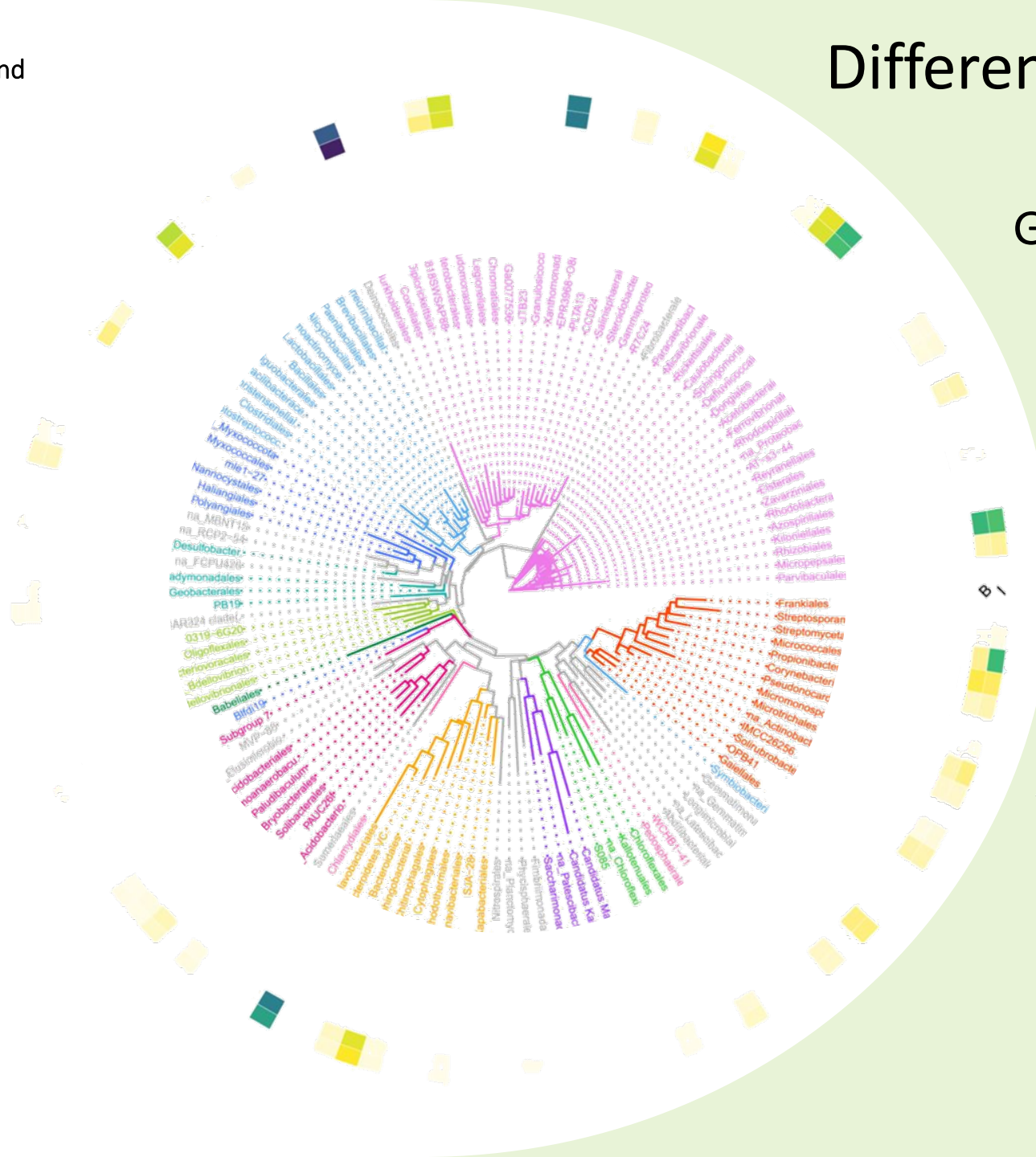


Generation



Rhizosphere 2nd generation

Differentially abundant ASVs



Generations:

1: 2191

111 in common

2: 192

Cultivars:

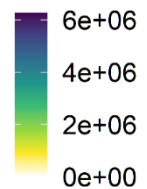
Bintje: 1275

346 in common

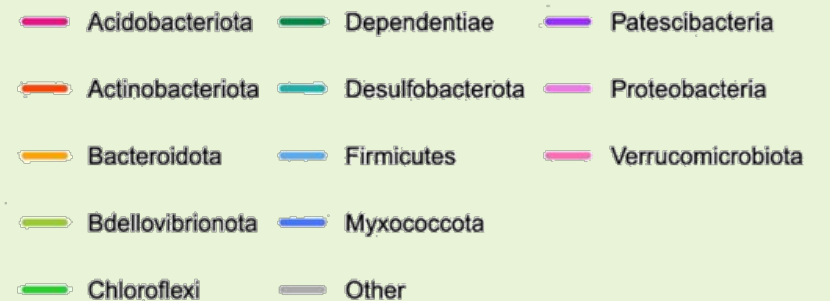
Innovator: 481

out of 5939 ASVs

Abundance



Phylum

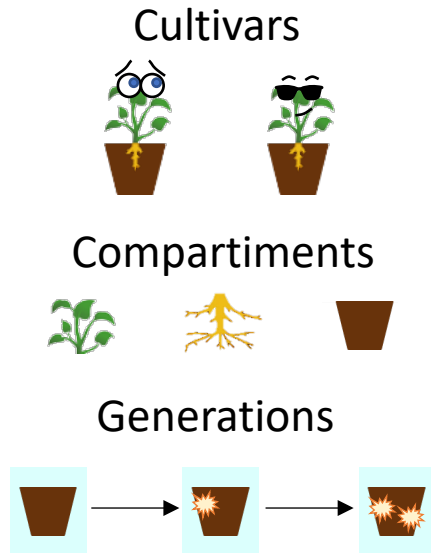


Do the recruited
genera show
antagonistic
activity?



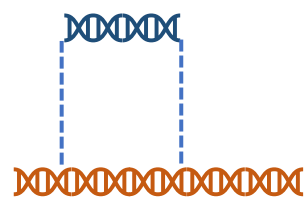
Differentially abundant strains

Infected vs non-infected plants

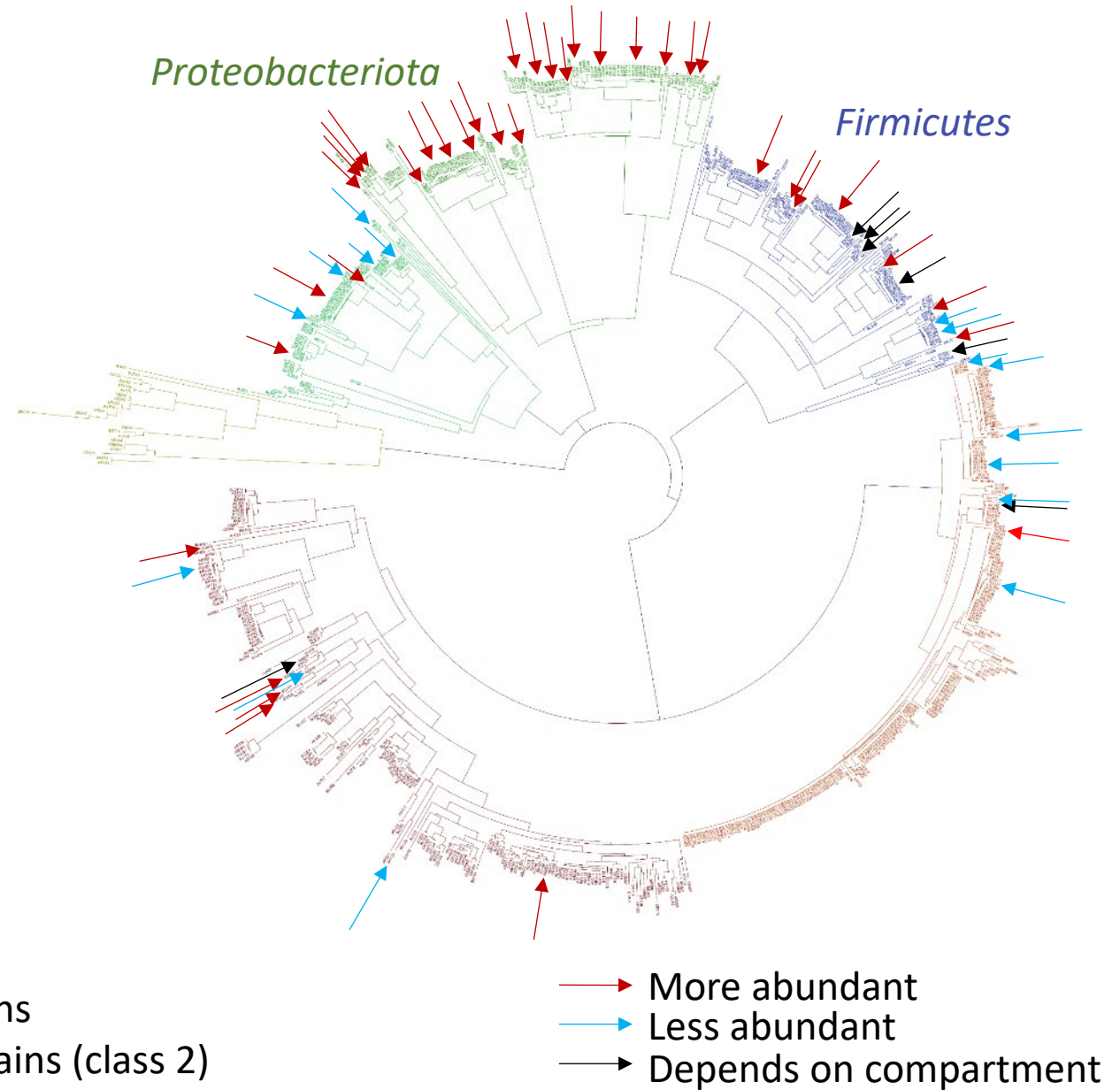


4731 differentially abundant strains

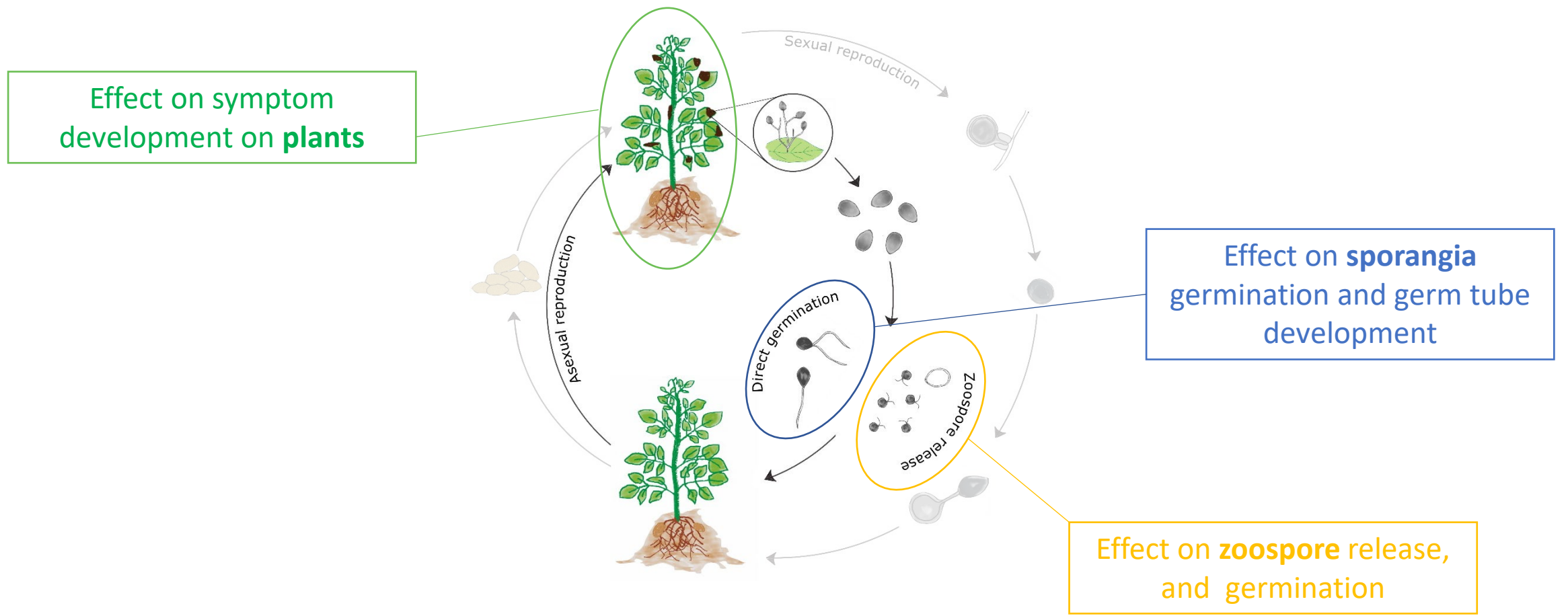
636 isolated strains



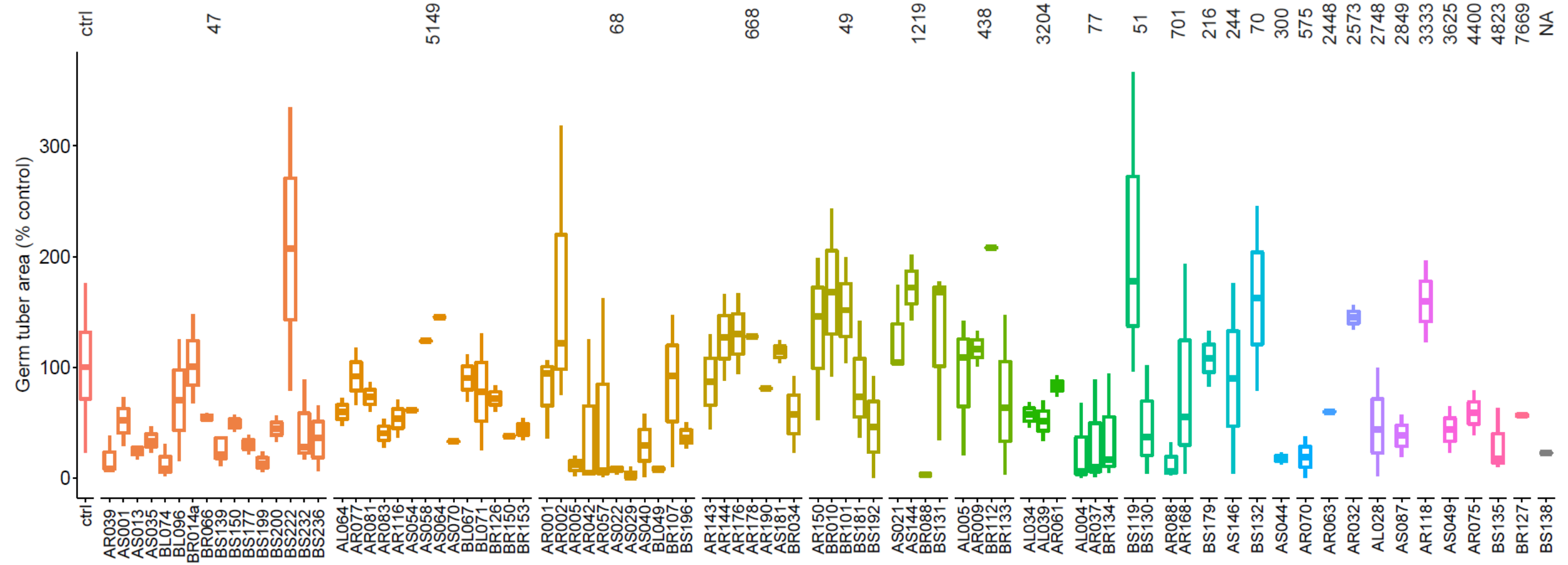
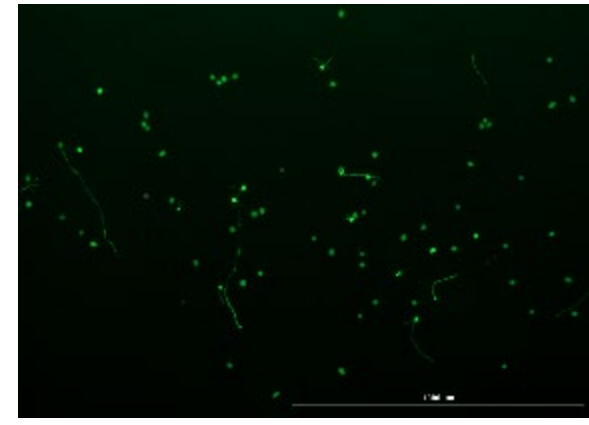
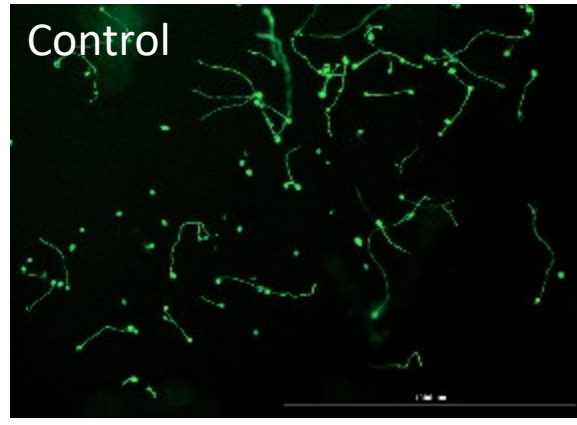
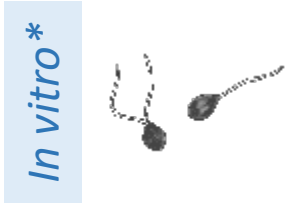
170 strains
- 31 strains (class 2)



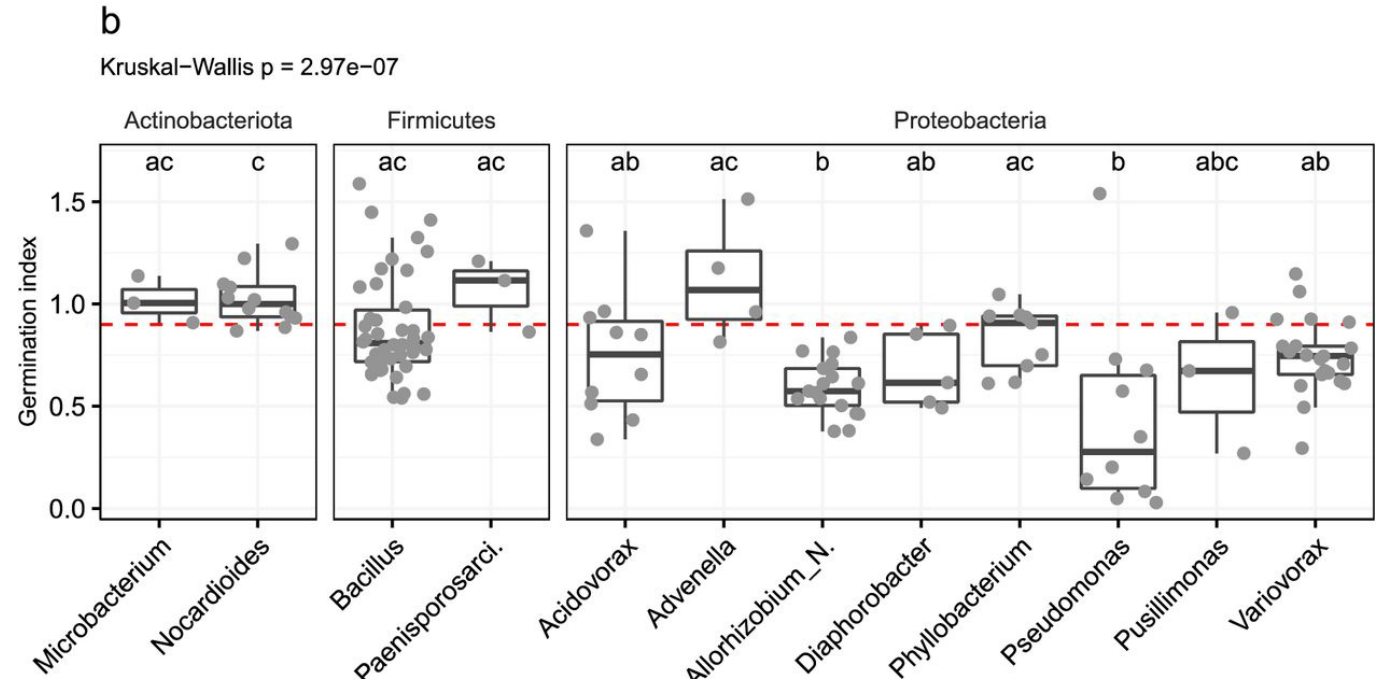
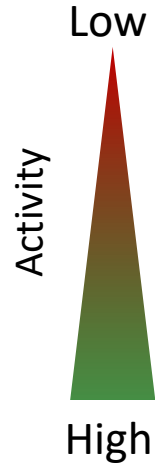
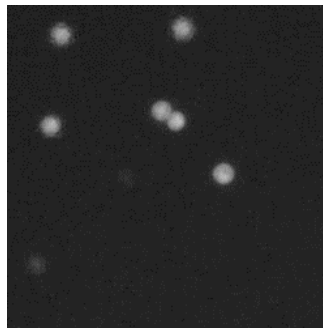
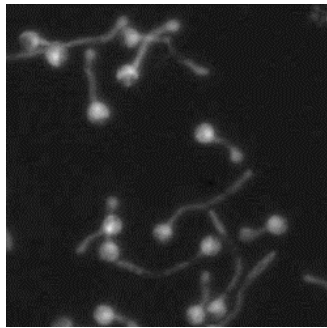
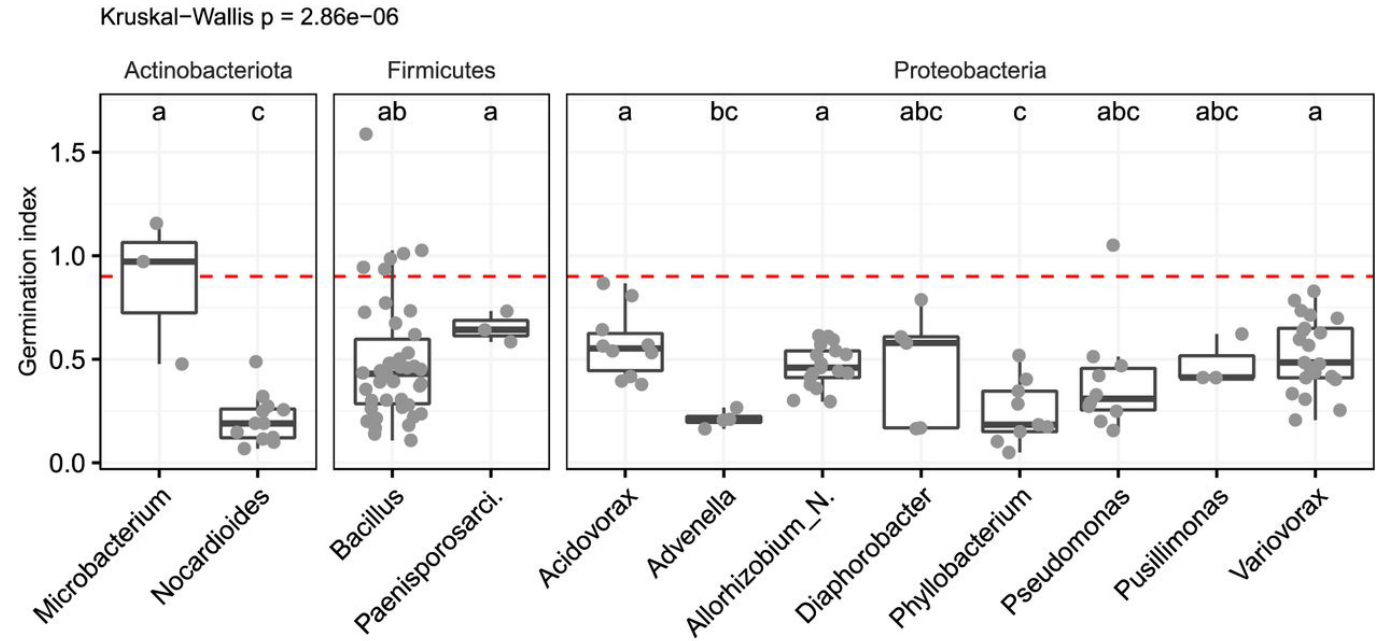
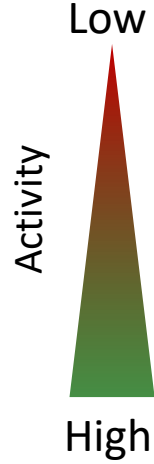
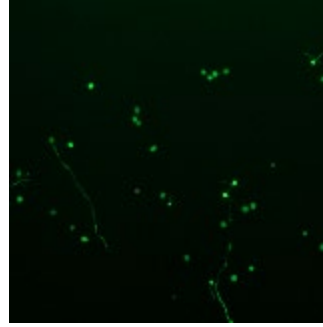
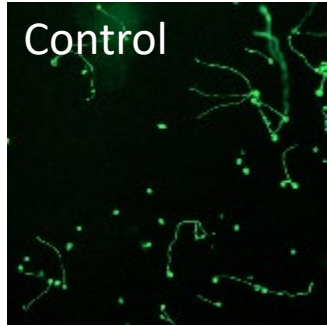
Testing the strains of interest



How does it look like?



Which genera are the most active ones?



Take home messages



- Richness and evenness are overall hardly affected by an infection with *P. infestans*
- The community composition of the phyllosphere, rhizosphere and soil are affected by an infection
- Bintje shows a stronger reaction

Can potato plants recruit beneficial microorganisms upon pathogen infection?

- No clear correlation was observed between infection-driven ASV abundance shifts and the inhibitory capacity of the corresponding isolates
- In most cases, effect is ASV specific or specific to small groups
- Interesting biocontrol genera: *Advenella*, *Nocardioides* and *Phyllobacterium*
- Innovator isolates are slightly more effective than Bintje isolates

Thank you!

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Natacha Bodenhausen

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Brice Dupuis
Maud Tallant

**WISSENSCHAFT.
BEWEGEN**
GEBERT RÜF STIFTUNG

... and you for your attention!