AUSTRIAN INSTITUTE OF TECHNOLOGY
TOMORROW TODAY

ENDOSEED™

Technologies to generate endophyte improved seed.

MICROBIALS IN AGRICULTURE

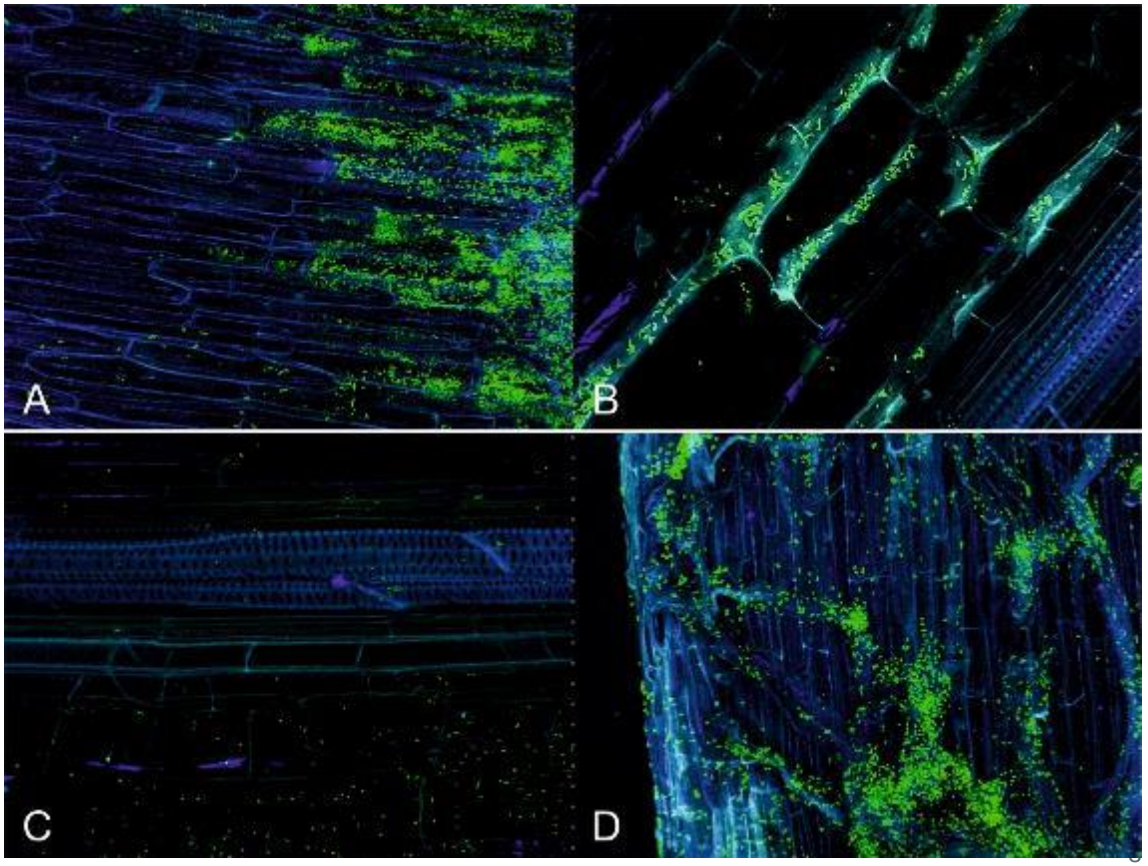
Many strong plant growth promoting bacteria and biocontrol strains are **gram-negative, non-spore formers**.

Sensitive to desiccation and **difficult to stabilize** in seed coatings.

P. phytofirmans PsJN

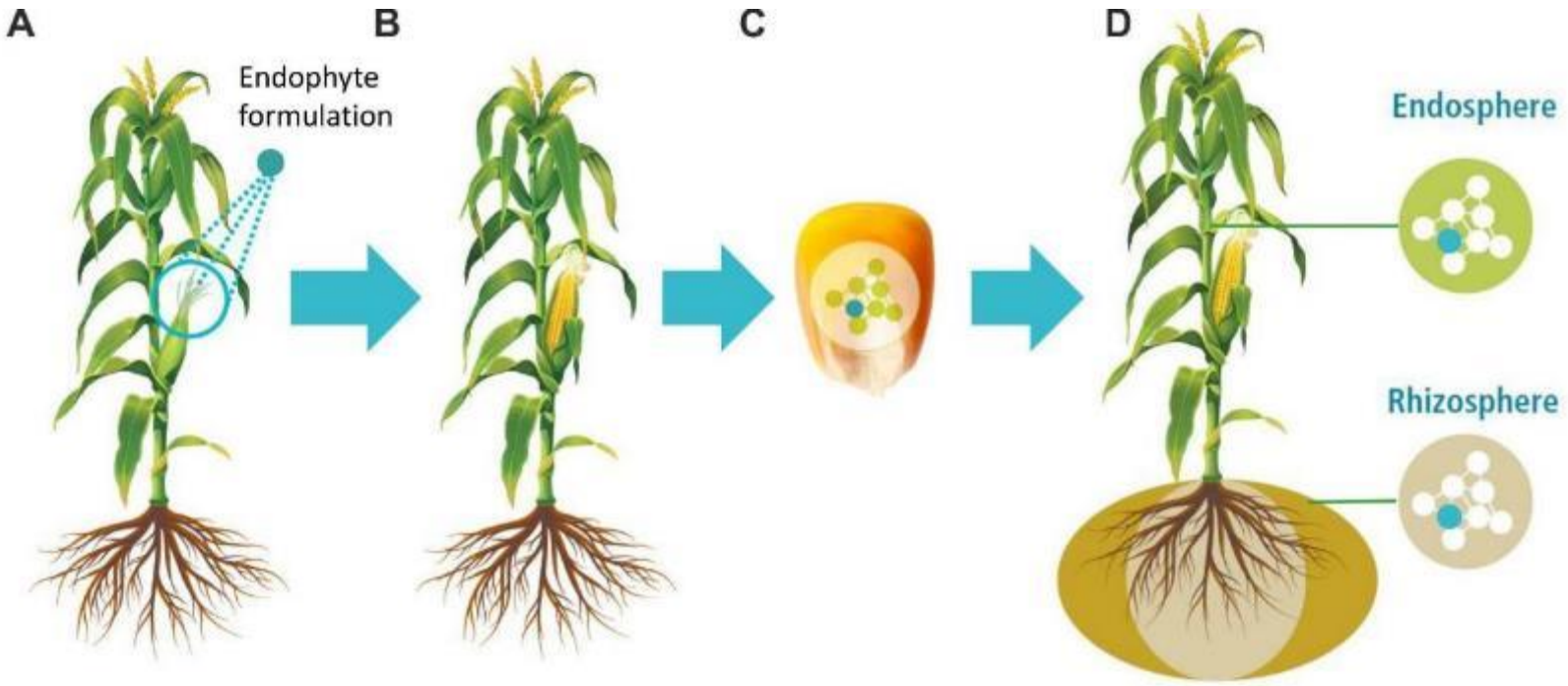
rhizosphere and endophytic populations in a wide variety of plants

potato, tomato, pepper, tobacco, sugar beed, maize, barley, wheat, grapevine, …



PsJN cells colonizing roots of corn seedlings

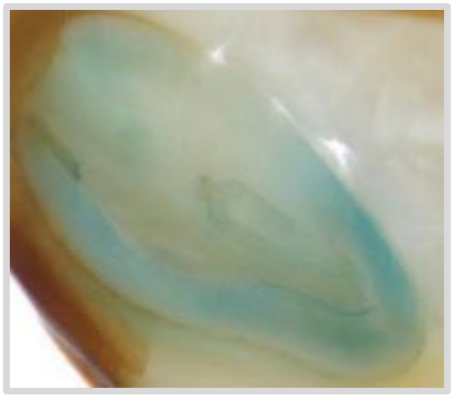
ENDOSEED™
Bacteria colonize seeds upon flower application



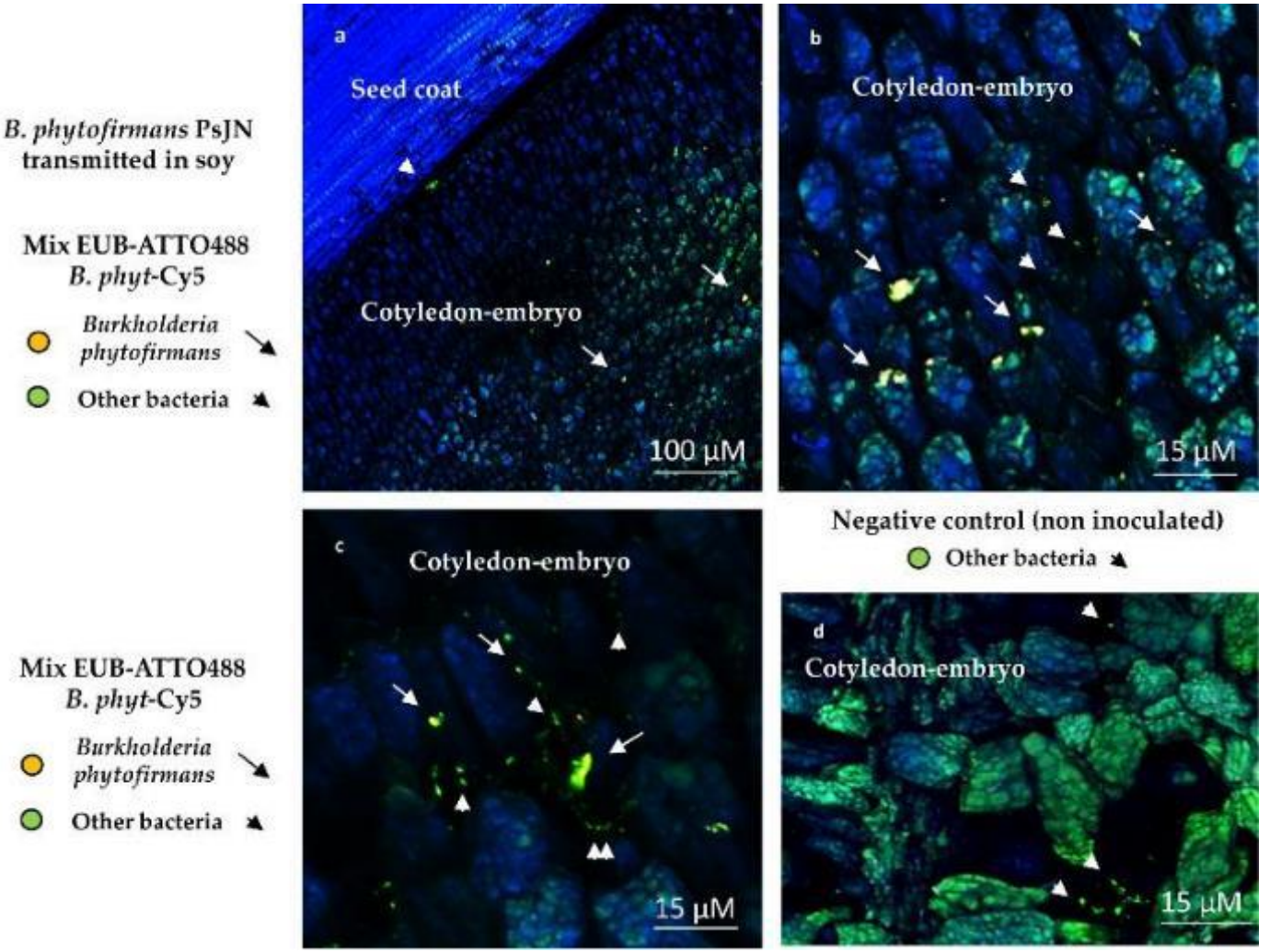
Frontiers Microbiol. 8:11, doi: 10.3389/fmicb.2017.00011

ENDOSEED™
Bacterial cells are located in the seed embryo

Maize (*Zea mays* L.) and *P. phytofirmans* PsJN::gusA

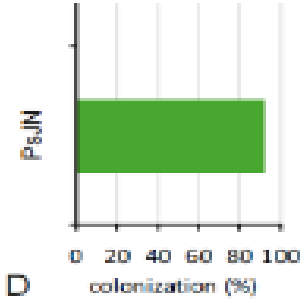




ENDOSEED™
SOY SEEDS WITH PsJN CELLS INSIDE THE EMBRYO



ENDOSEED™ APPLICATION IN THE FIELD

Spring wheat (*Triticum aestivum* cv. Trappe) and *P. phytofirmans* PsJN

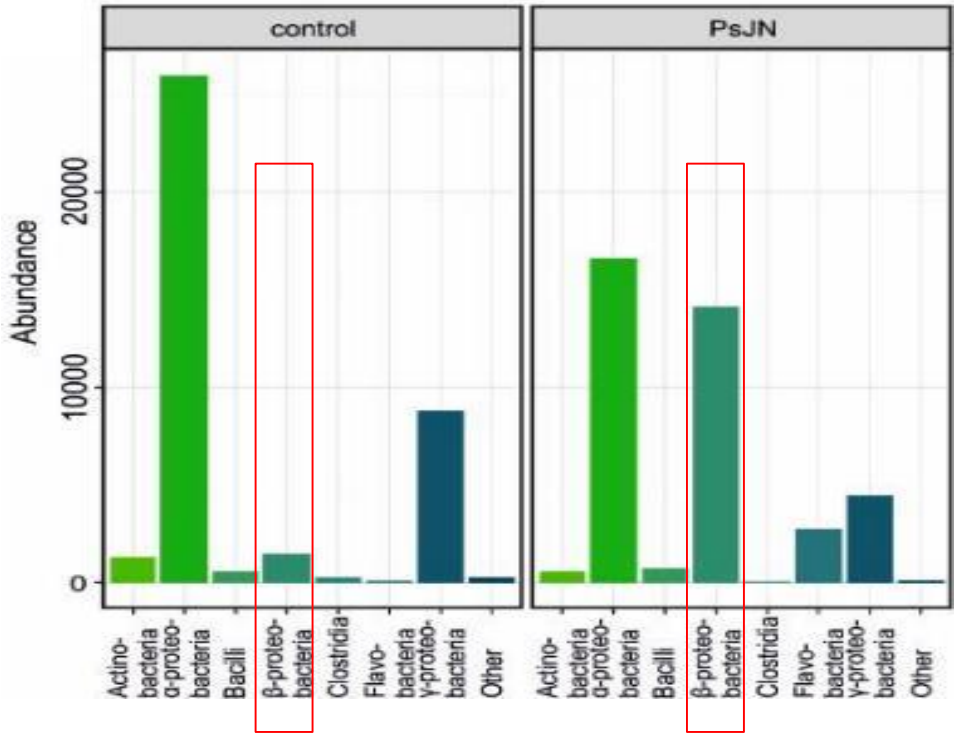


ENDOSEED™
CHANGES IN THE SEED MICROBIOME

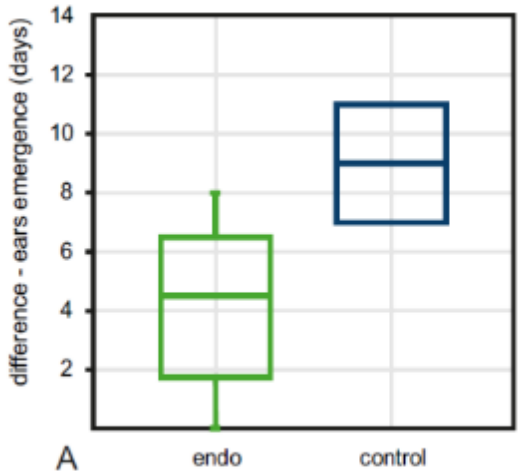
Spring wheat (*Triticum aestivum* cv. Trappe) and *P. phytofirmans* PsJN

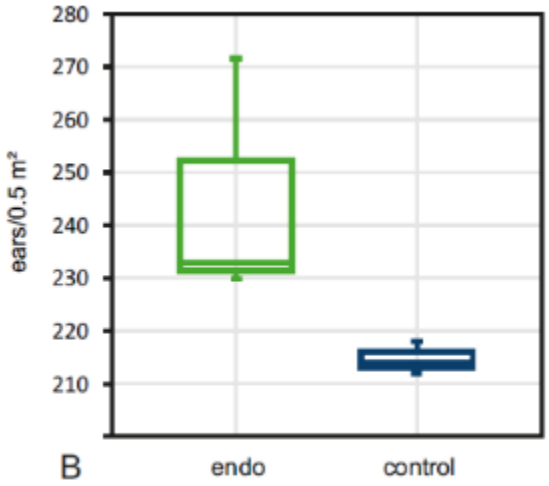
↑ β-*Proteobacteria*
Flavobacteria

↓ α-*Proteobacteria*
γ-*Proteobacteria*

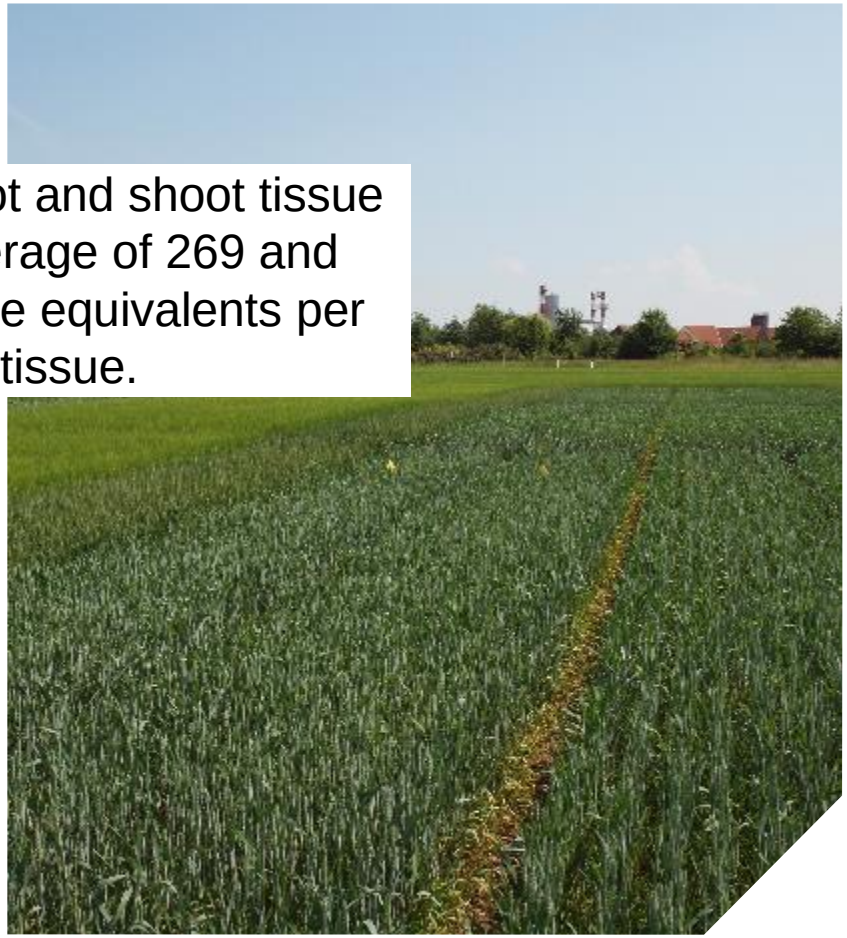


ENDOSEED™
CHANGES IN PLANT TRAITS





PsJN in root and shoot tissue with an average of 269 and 388 genome equivalents per gram plant tissue.



ENDOSEED™

plant reproductive organs as **entry port** for microbes

plant seed as **protective carrier** for microbial inoculants

optimal for **sensitive bacteria**, which are difficult to stabilize on seed

ACKNOWLEDGEMENTS

Austrian Institute of Technology

Nikolaus Pfaffenbichler
Stéphane Compant
Livio Antonielli
Muhammad Naveed
Teresa Berninger
Alexandra Petric

Head of Bioresources
Angela Sessitsch

Indigo Ag

Geoffrey von Maltzahn
Richard Flavell
Yves Millet

AUSTRIAN INSTITUTE OF TECHNOLOGY
TOMORROW TODAY

THANK YOU!

Birgit Mitter, October 25th, 2017