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Improving apple fruit biological control by microbiota using omics tools

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Potenital of the new biological control pattern

The developement of next generation sequencing has boost plant microbiota profiling

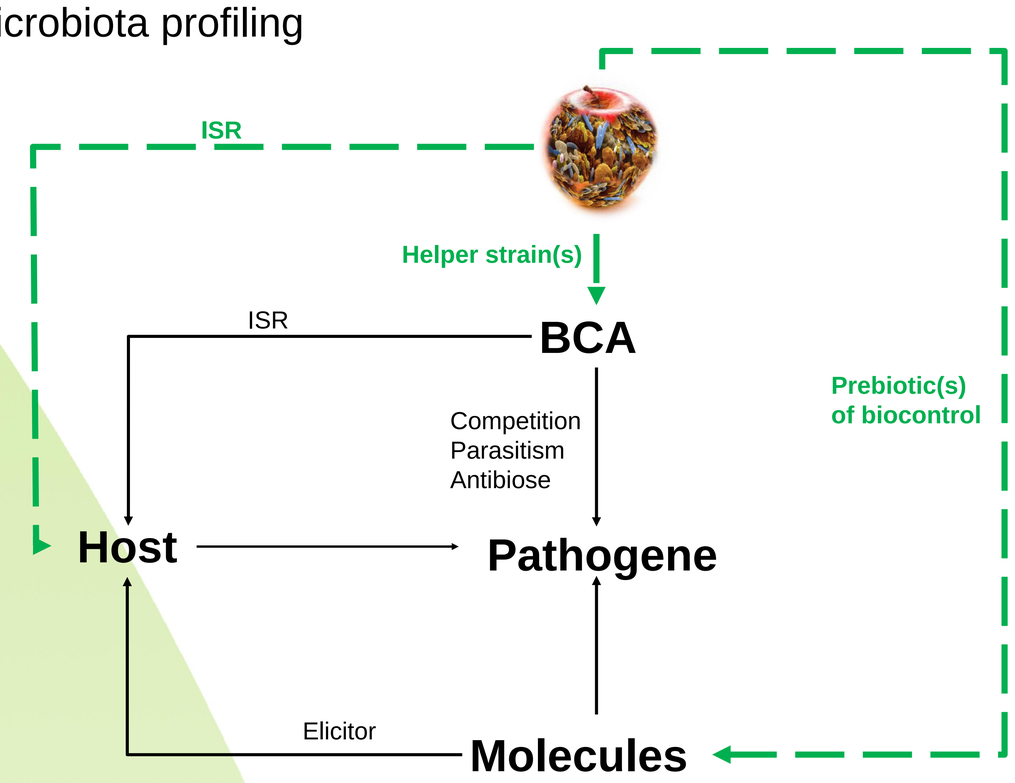


Figure 1. Classic (full arrows) and new (dotted arrows) Biological control pattern ; ISR=Induced Systemic Resistance; BCA=Biological Control Agents.

In the classic pattern of biocontrol, a BCA or a molecule is used to control directely a pathogen, or indirectely to induce host defense system. When the microbiota is introduced (Figure1; Massart al., 2015 [1]), new possibilities show up as the use of helper strains or prebiotic of biocontrol.

Helper strains and prebiotics of biocontrol

Helper strain is a strain that has no biocontrol activity but foster the BCA biocontrol activity
A prebiotic of biocontrol is a molecule that drive the composition of the microbiota to limit the developement of the pathogen

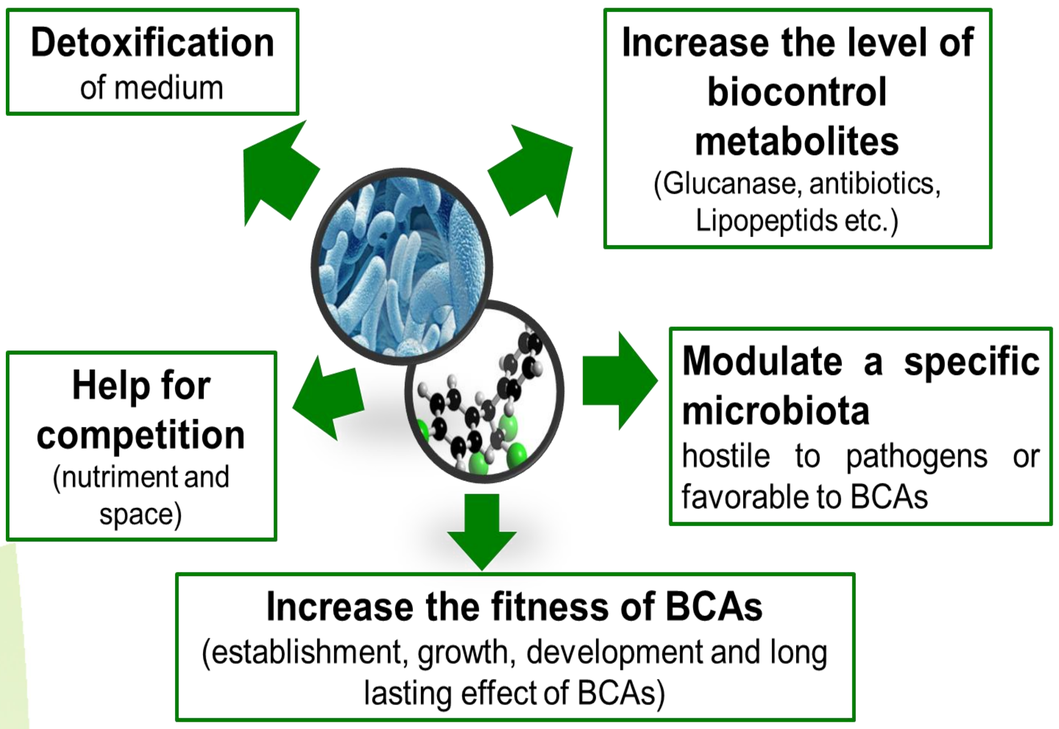
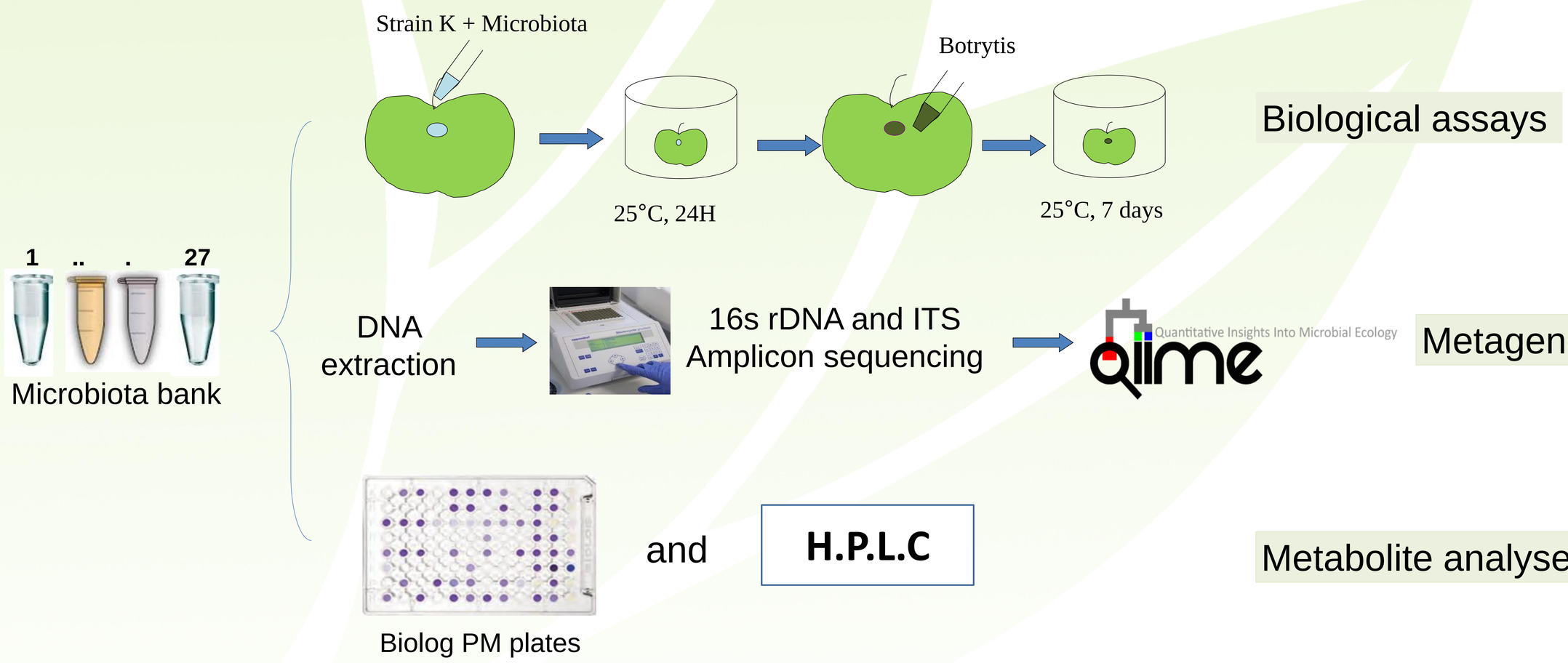


Figure 2. Potential modes of action of helper strains and prebiotics of biocontrol

Constitution of apple microbiota bank to identify helper strains and prebiotcis of biocontrol

In order to improve *Pichia anomala* strain K efficacy against grey mold (*Botrytis cinerea*), apple samples were collected and the skin microbiota harvested to create a bank of microbiota from 4 locations (France, Belgium, New Zealand and Chili), 17 varieties and three disease management practices (never treated for 35 years, Biological and Integrated treated).



The study is ongoing and the results will further allow us to understand better the interplay between the strain K and the epiphytic microbiota of apple.

1. Massart S., Martinez-Medina M., Jijakli H. Biological control in the microbiome era: challenges and opportunities. *Biol Control*. 2015;89: 98–108.

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