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TOWARD A SUSTAINABLE VITICULTURE IMPROVED GRAPEVINE PRODUCTIVITY AND TOLERANCE TO ABIOTIC AND BIOTIC STRESSES BY COMBINING RESISTANT CULTIVARS AND BENEFICIAL MICROORGANISMS

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Anna Kicherer, et al.

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Toward a sustainable viticulture: Improved grapevine productivity and tolerance to abiotic and biotic stresses by combining resistant cultivars and beneficial microorganisms

Ait Barka E., Aziz A., Sanchez L., Trolat-Aziz P., Jacquard C., Cl ment C., Gaveau-Vaillant N., Tzortzakis N., Topfer R., Kicherer A., Escalona J.-M., H FTE M. REY P., Gardiman M., De Nardi B., Grando M.S., Fusco L., Maciejczak M., Vermunt A., Falc o Salles J., Agstner B., Taglietti F., and other members of Vitismart consortium

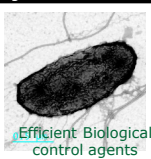
GOALS: to improve resistance/tolerance strategies of grapevine cultivars to pathogens and to mitigate the undesirable effect of climatic change

Outcomes:

- Identification of susceptible and resistant genotypes for their tolerance/resistance to pathogens



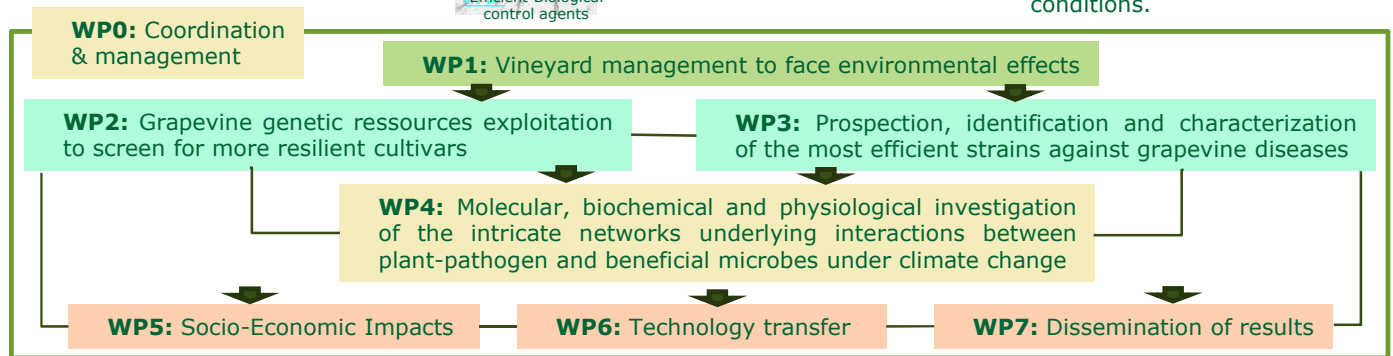
- Identification of efficient Biocontrol agent (BCA) against main grapevine diseases



- Establishment of the best association between bacteria and resilient cultivars in order to deliver a new generation of grapevines adapted to climate change



- Investigate the physiological and molecular responses of grapevine inoculated with selected beneficial bacteria, under heat and water deficit conditions.

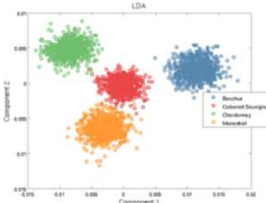
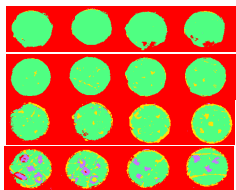


Water shortage
High temperatures

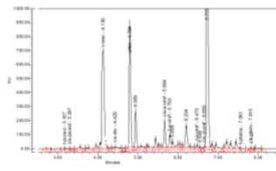
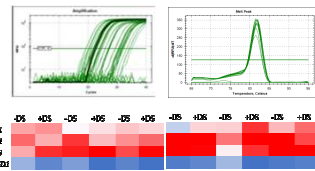
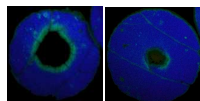
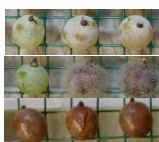
Plasmopara viticola
Botrytis cinerea

WP 2: Resilient cultivars

Hyperspectral imaging to early detect DM
Downy mildew: Leaf disc assays with 27 different genotypes (susceptible; resistant and breeding lines). The hyperspectral tool consists of five different models to achieve best prediction performance.



Grey mold: Mapping of physical barriers against Botrytis/Drought



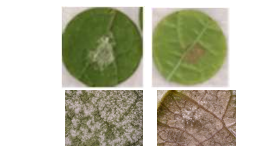
WP 3: Efficient microbes

Characterization of microbiome from resilient cultivars by molecular tools



Microbial co-occurrence in the rhizosphere and endosphere using 16S rRNA based metagenomics, metatranscriptomics

- Identification of efficient strains
- Pseudomonas fluorescens* sp.
- Paraburkholderia phytolimans*
- Pythium oligandrum*



WP 4: Mechanisms underlying the tripartite interaction under climate change

Identification of genotypes more adapted to abiotic stress conditions

Induced Tolerance

Physiology, primary metabolism, mineral status....

Hormones, minerals ...

Induced Resistance

Priming of plant immune system

MAMPs

Beneficial microbes

Identification of susceptible and resistant genotypes to biotic stress

Establishment of the best association between bacteria and resilient cultivars