



INTERVIEW DR.CHARRIER GUILLAUME

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RESEARCH SUBJECT: Ecology and functional genomics

After the interview with Dr.Vacher, we asked some questions about abiotic stress like frost and desiccation, and Dr.Vacher gave us the mail address of Dr.Charrier, which was specialized in these questions. We hence decided to contact him to know if our strategies of protection were relevant and know more about abiotic stress. He answered gladly our questions and we want to thank him for this !

WHAT DO YOU THINK ABOUT USING CHITIN TO REFLECT SUNLIGHT? WILL IT INFLUENCE THE PLANT? IS IT PROBLEMATIC IF WE DON'T SECRETE IT?

→Secreting chitin is not really important and will even be less impactful for the plant physiology. Chitin has no osmotic impact and it should not alter the whole environment.

**WHAT DO YOU THINK ABOUT THE STRATEGY OF USING ANTIFREEZE PROTEINS TO AVOID ICE NUCLEATION?
WHAT ABOUT THE ICE-NUCLEATION STRATEGY? (SEE “[COMPOUND CHOICE](#)” REPORT)**

→The glaciation phenomenon is complex. The ice crystals can attract free water and dehydrate the cells. Ironically, the dehydration of cells by ice formation will protect them against formation of intracellular crystals. Hence, if you want to inhibit extracellular ice formation, make sure it will not form in the cells.

Usually, ice forms from nucleation points such as bacteria and membrane irregularities. Technically, inhibiting the ice formation on the surface of the leaves could work, you can also combine AFPs.

On the other hand, forming ice at the surface of the leaves, just like the water aspersion method, induces heat release and protect inner tissues against ice formation. Nethertheless inducing ice formation at the surface of young leaves can be problematic and dangerous (Editor's note : the tissues are less tolerant and more fragile).



WE WANT TO TRY A PROOF OF CONCEPT ON LEAVES WITH OUR COMPOUNDS OR MIMICS AND EVALUATE THE DAMAGES DONE ON PLANT CELLS AFTER TEMPERATURE STRESS. WHAT DO YOU RECOMMEND?

→To measure frost damages, you can use electrolytes and measure conductivity. You take the leaf and put it in the measured medium, than you dose the ions in the medium. Damaged leaves will release more ions that will be observable by the device. This works as well for the damages caused by heat. You could use thermocouples to analyze the temperature of ice formation.

ANY OTHER REMARKS?

→I do think the problems you are trying to solve can be assessed through varietal selection of plants. You should also be careful not to affect the wine labels such as "AOC" (Protected Designation of Origin).

We want to thank Dr Charrier for the time he gave us and all the information he provided us !