

WG3 Cluj Round Tabel Discussion 27.05.2016

Fungal Side

- **Secondary metabolites, polypeptides, proteins, degrading enzymes and polysaccharides etc.**
- Isosclerone, Scytalone, related to the main pathway of melanin biosynthesis
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- Siderophores, produced mostly in mixed cultures
- Exopolysaccharides, impact of the medium? Complicated EPS by the mixture of differing sizes, it is complex to identify the branched mannane, EPS can be found in all GTD fungi.
- Polypeptides from *N. parvum*, (weight of 5000 Da) isolation and characterization is in progress
- Still to investigate the effects of PAMPS and DAMPS

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Fungal Side

- **Secondary metabolites, polypeptides, proteins, degrading enzymes and polysaccharides etc.**
- degrading enzymes, a lot of work has been accomplished in all GTD related fungi esp. in *Botryosphaeria*, but mostly in Fmed.
- Organic acids (succinic acid, mostly *Botryosphaeria*, might be for others)
- Plant hormones should be object of more investigations, *N.parvum* methyl salicylic acid (was found in plants expressing symptoms of GTD), tyrosol and methylcatechol were identified from *N. australe* from grapevine.
- Can we find factors acting as plant hormones, e.g. abscisic acid, cytokinins, ...
- *L. mediterranea* isolated from grapevine (compound with a structure related to jasmonic acid)
- Can we trigger the fungus to produce differing secondary metabolites by triggering the fermentation by artificial added plant compounds?
- What is the function of all “phytotoxic” compounds?

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Fungal Side

- **What are the triggers for symptoms emergence, switch of growths mode**
- Impact of climatic conditions (high water conditions or drought, physiological conditions (e.g. age of the plant, influence of vigor, full growths” conditions with large sink tissue), wound protection on new vineyards, training system, influence of the rootstocks
- cumulative effect of infection symptoms appears after three years
- Influence of carbohydrates for symptoms generation?
- Fungal colonization on the cell level, is there any compartmentation, eg. Pch colonize the parenchyma, Fem the S2 cell layers, any colonization dynamics? Needs to be investigated by using fluorescence-labeled transformed strains

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Fungal Side

- **Infection assays based on artificial plant infections**
- Write simple protocols of all assays used by the community and make it available on the website, review.
- Using the models: Identify different genotypes to compare cultivars (which different susceptibility) on molecular basis

- **What is the x factor of leaves symptoms?**
- Differences between the infections in the plant tissues?
- WG1: defined: *C. sauvignon* and *Chardonnay* as basic cultivars
- Mode of action of the secondary metabolites?

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Plant Side

- **Defense and reaction, identify resistance mechanisms, can the plant health be enhanced?**
- Defense reaction is activated but it seems not enough to stop the infection
- Distinct differences in transcriptome analysis (PR proteins) between plants with and without leaves symptoms and between plants with and without wood symptoms (in vineyard) but correlation between response activation and susceptibility needs to be investigated. Therefore we need more results in a controlled model system.
- Similar results were obtained when different susceptible cultivars were treated with sodium arsenite.

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Plant Side

- **How effective are the plants polyphenols?**
- The cultivar susceptibility depends on the production of polyphenols. Their production depends on vigor and the capacity to produce the polyphenols under stress conditions.
- Trans-resveratrol, and its oligomers have a negative effect on the pathogens, production also depends on the cultivar.

- **Crosstalk trunk and leaves**
- Still to be investigated: hormone transportation, any signals e.g. siRNAs...

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Plant Side

- **Infection process, plant fungus interaction, role of antagonistic fungi and endophytic fungi, application of fungicides**
- Trichoderma function focused on growths inhibition and competition
- Other fungicides (biological sources) are investigated by WG4

- **Standardized methods to identify infected plants, overcome the lag and symptom free phase of infection**
- Drone experiments to observe and identify visual effects (*C. sauvignon*, needs to be validated on other cultivars)
- Can multiplex camera data on impact of water stress be correlated with leaves symptoms and the usage of the drone?