

## Structural elucidation and biosynthesis

- Biosynthesis studies of fungal metabolites
- Structural elucidation via NMR and LC-MS

## Enzymatic formation of resveratrol trimers

The ascomycete *Neofusicoccum parvum*, a member of the Botryosphaeriaceae family, is a pathogen that causes dieback symptoms in grapevines. Wild Grapevines (*Vitis vinifera* subs. *Sylvestris*) showed variable degrees of resistance against *Neofusicoccum parvum*.

Resistant lines accumulated more stilbenes, that were in addition significantly partitioned to non-glycosylated iniferin trimers. In contrast, the susceptible genotypes accumulated less stilbenes with a significantly higher proportion of glycosylated piceid.

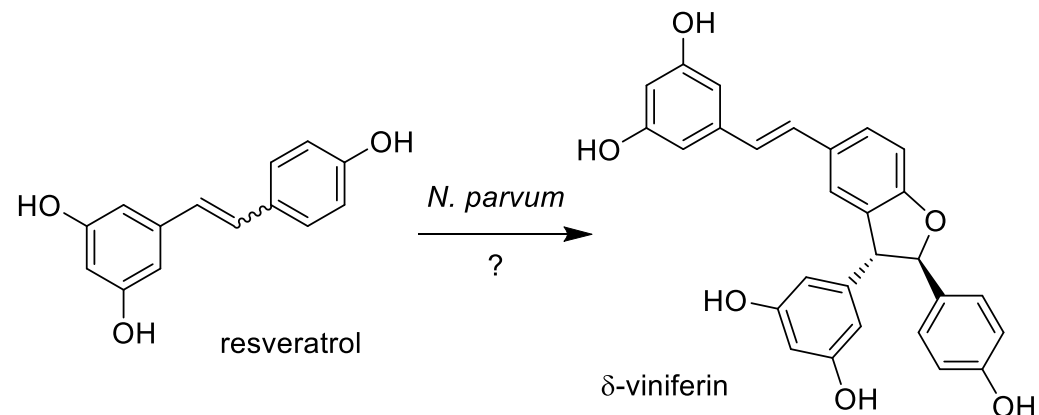
In grapevines, the accumulation of stilbene phytoalexins is a central element of pathogen associated molecular patterns-triggered immunity against, e.g., Ascomycetes. The stilbene pathway might also play a defensive role against *Botryosphaeriaceae*. This assumption is supported by comparative *in-vivo* infection studies using *Neofusicoccum parvum*.

Nick et al. found stilbene metabolites to accumulate in response to infection. The antifungal activity of resveratrol and  $\delta$ -viniferin could be shown *in vitro* using three fungal strains associated with symptom expression. Among the tested strains, *Neofusicoccum parvum* was not only the most aggressive strain *in planta*, but also the strain least affected by stilbenes.

ALU performs experiments with *Neofusicoccum parvum* on the dimerization of compounds with the aim of investigating which organisms are involved.

## Kontakt

Prof. Michael Müller  
Institute of Pharmaceutical Sciences  
Albert-Ludwigs-University Freiburg  
79194 Freiburg, Germany  
Email: michael.mueller@pharmazie.uni-freiburg.de



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## *Neofusicoccum parvum* feeding experiments

- LC-MS characterization of resveratrol and  $\delta$ -viniferin
- Several characteristic MRM scans for monomer and trimer
- Highly selective and sensitive detection
- Resveratrol is fully consumed by *Neofusicoccum parvum*
- Dimerization and trimerization could not be verified
- In follow-up experiments polymerization has to be elucidated



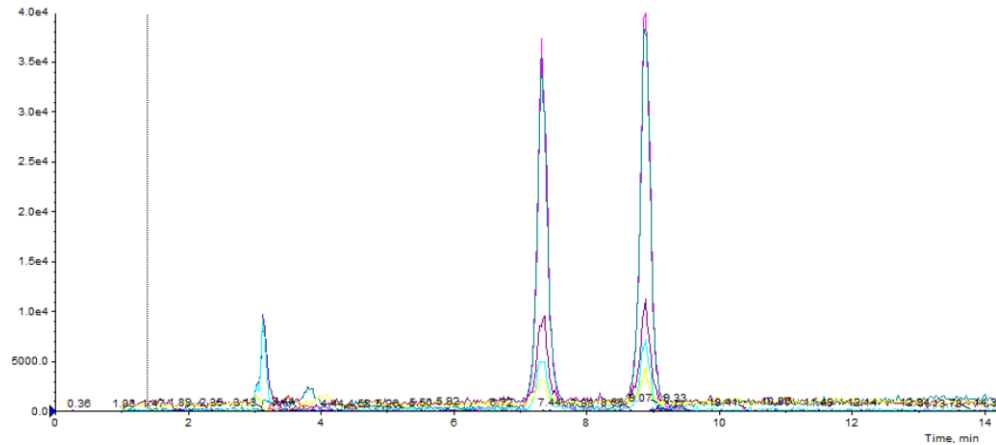
Fonds européen de développement régional  
(FEDER)  
Europäischer Fonds für regionale Entwicklung  
(EFRE)



Der Oberrhein wächst zusammen: mit  
jedem Projekt *Dépasser les frontières,*  
*projet après projet*

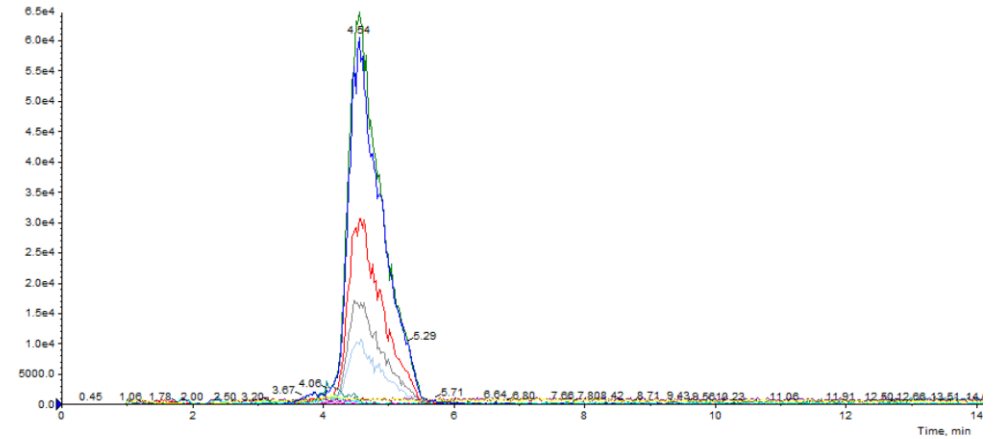
## LC-MS / MRM scans resveratrol

Resveratrol negative control 100 pg



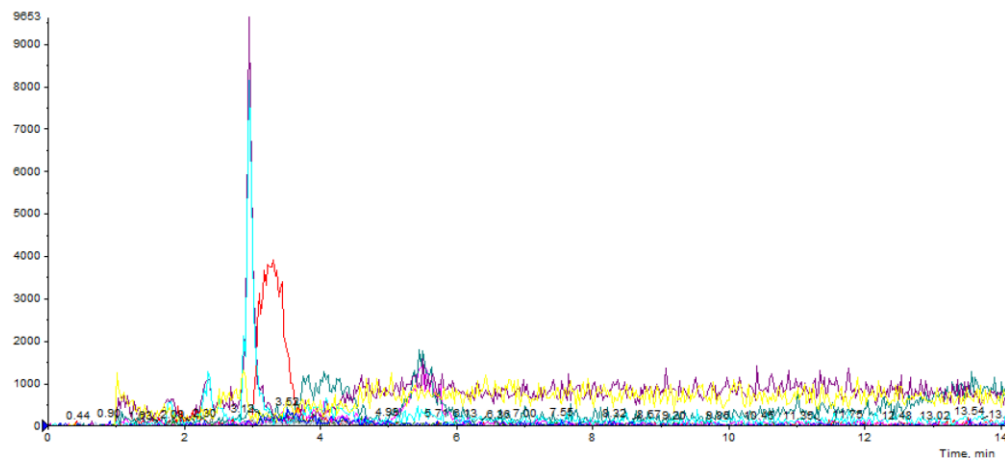
## LC-MS / MRM scans $\delta$ -viniferin

$\delta$ -viniferin negative control 900 pg



## LC-MS / MRM feeding experiment

Feeding resveratrol 100 ng



## MRM experiments

- XIC of -MRM (10 pairs): 452.993/358.900 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 452.993/93.000 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 452.993/359.000 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 452.993/119.000 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 452.993/197.100 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 226.889/184.800 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 226.889/142.700 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 226.889/159.000 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 226.889/114.900 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)
- XIC of -MRM (10 pairs): 226.889/118.900 Da from Sample 3 (Viniferin) of Neofusi1.wiff (Turbo Spray)