

Conference abstract SL-31

## **Austrian Red Wine Samples Reveal Enhanced Activity of the Enzyme Endothelial Nitric Oxide Synthase**

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Red wine polyphenol extracts (RWPE) have been shown to increase nitric oxide (NO) release from EA.hy926 endothelial cells [1]. Trans-resveratrol seems to partly contribute to this effect by inducing endothelial NO-synthase (eNOS) expression [1]. Aim of this study is to identify further major active component(s) by bio-assay guided fractionation.

For a systematic approach we selected 60 representative red wines from Austria and chose seven outstanding in specific components as samples (Zweigelt, Merlot, Pinot Noir, two Blaufränkisch and two Sankt Laurent) for bio-assay guided fractionation using EA.hy926 endothelial cells and the [<sup>14</sup>C]L-arginine/[<sup>14</sup>C]L-citrulline conversion assay measuring eNOS activity. Wines were applied either as tenfold concentrate or fractionated by a polystyrene column into the first eluate (FE) and the red wine polyphenol extract (RWPE).

Further fractionation of the RWPE of four red wine samples (Zweigelt, Pinot Noir, Merlot and one Blaufränkisch) was done by liquid-liquid-dispersion using H<sub>2</sub>O and EtOAc. A polar fraction (PF) and an apolar fraction (AF) were obtained and both tested for eNOS activation. Furthermore, the AF of Blaufränkisch was separated by SPE with increasing MeOH concentrations into five fractions (SP1%MeOH, SP5%MeOH, SP10%MeOH, SP40%MeOH, SP70%MeOH).

Tenfold concentrates of the seven wine samples led to eNOS activation although to a different extent which correlated with their total phenol content indicating that the phenol content is important for measured eNOS activity. On the other hand, RWPE tested in equal concentration (600 µg/ml) differed in their eNOS activation suggesting that also the phenol pattern is crucial for activity. FE were completely inactive. AF of the four samples showed enhanced eNOS activity. PF of three samples did not increase the enzyme activity, although PF of Pinot Noir was effective. Further fractionation of the Blaufränkisch-AF offered eNOS activity by SP10%MeOH. Ongoing fractionation of SP10%MeOH will elucidate the responsible compounds for the observed eNOS activation.

- [1] Räthel TR, Samtleben R, Vollmar AM, Dirsch VM. Activation of endothelial nitric oxide synthase by red wine polyphenols: impact of grape cultivars, growing area and the vinification process. *J Hypertens.* 2007; 25: 541–549. doi:10.1097/hjh.0b013e328013e805