

## Investigating the correlation between activation of the Nitric Oxide pathway and inhibition of the NLRP3 inflammasome in endothelial cells in preeclampsia

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**Objective.** Different pathways have been proposed for pathogenesis of Preeclampsia, NO pathway as a complex molecular pathway, plays a key role in endothelial dysregulation. The NLRP3 inflammasome and its components activate NF- $\kappa$ B, which is considered as the “holy path” in the pathogenesis of many vascular disorders through IL-1 $\beta$  including preeclampsia. We investigated the inhibition of possible inflammation by drugs affecting this pathway, such as (sGC)stimulators-riociguat.

The objective is to analyse the role of the NLRP3 Inflammasome and the Nitric Oxide pathway in Preeclampsia and to investigate the potential anti-inflammatory effects of riociguat.

**Materials and Methods.** This experimental research was carried out at the University of Heidelberg in Germany - Department of Clinical Pharmacology, in primary human cells: HUVEC as well as HPAEC. The cultivation of cell cultures is done according to strict tools and protocols. The cells were

divided in four groups and were treated with different concentrations of TNF $\alpha$ , and/or ATP and/or Riociguat. We measured Caspase-1, IL-1B and riociguat concentrations. ANOVA was used to calculate the correlation between the groups, and Tukey test to clarify differences.

**Results.** We had significant results from three groups but the comparison between control and highest RCG 50  $\mu$ M concentration and TNF $\alpha$  has shown a statistically significant difference of  $p = 0.0013$ .

The analysis of the RCG plates considering only the highest concentration of RCG (50  $\mu$ M) have shown an activation of the inflammasome. However, addition of RCG has no effect on this activation.

**Conclusions.** A possible correlation between NO and NLRP3 pathways should be considered to observe surrogate markers for early detection of inflammatory response, further research and different concentrations of riociguat should be investigated.