

**GSH screening of vitamin E acetate pyrolysate to identify potential harmful compounds in e-cigarettes/vaping products**

There are increasing reports of pulmonary injury (product use-associated lung injury, EVALI) related to vapor products. In most of the BALF (Bronchoalveolar Lavage Fluid) samples from EVALI patients, vitamin E acetate (VitEac) was found [1]. Wu and O'Shea [2] described a possible mode of action for the toxicity of VitEac. Ketene, a highly toxic compound, was identified as pyrolysis product of VitEac.

GSH screening is frequently applied, e.g. in metabolism research or in the cosmetic industry [3, 4], to detect electrophilic compounds, which are able to covalently bind to proteins. GSH is present in high concentrations in lung lining fluid. Once the GSH is depleted, electrophilic compounds bind to proteins and may disrupt their function and lead to diseases [5].

Within this project, reaction products of GSH with VitEac pyrolysate were identified using high resolution LC-MS. S-Acetyl-GSH, the reaction product of GSH with ketene, was found as major product. Another GSH-adduct was identified as reaction product of trimethylbenzoquinone.

These GSH-adducts in BALF may serve as biomarker of exposure to potential toxic compounds in vapor of VitEac containing liquids. GSH adducts usually undergo degradation by the mercapturic acid pathway [6]. As an alternative to the determination of GSH-adducts in BALF, the corresponding mercapturic acids in urine samples may seve as biomarker.

[1] DOI: 10.1056/NEJMoa1916433   
[2] DOI: 10.26434/chemrxiv.10058168   
[3] DOI: 10.1021/tx600277y [4] DOI:10.1016/j.tiv.2005.07.003   
[5] doi: 10.2147/IJGM.S15618 [6] doi: 10.3109/1354750X.2016.1141988