

**Wenger D./EMPA Switzerland**

**Secondary Effects of Catalytic Diesel Particulate Filters: Reduced Emissions of Potential Endocrine Disruptors**

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Diesel exhaust contains potential endocrine disruptors that show different modes of action such as triggering estrogen receptor (ER) or aryl hydrocarbon receptor (AhR) mediated pathways. Endocrine disrupting chemicals interfere with the hormone system and thus may cause adverse health effects in humans and animals.

The aim of our study was (i) to investigate ER and AhR agonists in exhaust generated by a heavy duty diesel engine and (ii) to assess the effect of diesel particulate filters on emissions of these agonists. We tested two cordierite-based, wall-through diesel particulate filters, for which soot combustion was either catalyzed with an iron- or a copper-based fuel additive. To detect and quantify ER and AhR agonists, we used *in vitro* reporter gene assays (CALUX assays). Assay responses were expressed as equivalents of 17 $\beta$ -estradiol (E2) and 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD), respectively, which were used as reference compounds.

The analyzed diesel exhaust samples contained ER agonists at levels of 0.5-1.8 ng E2 CALUX equivalents per m<sup>3</sup> diesel exhaust and AhR agonists at levels of 6-60 ng 2,3,7,8-TCDD CALUX equivalents/m<sup>3</sup>. Both tested diesel particulate filters reduced emissions of ER agonists by 55-68% and emissions of AhR agonists by 88-89%.