



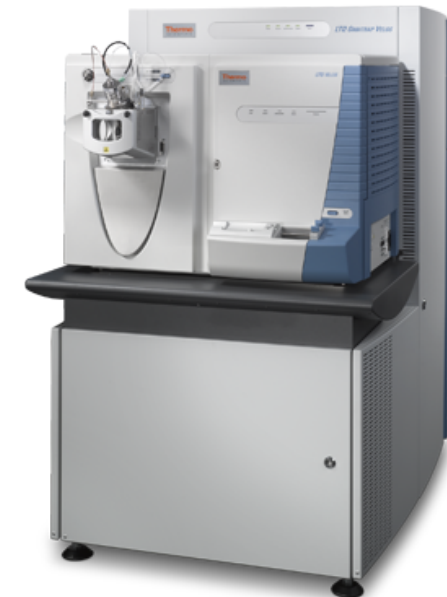
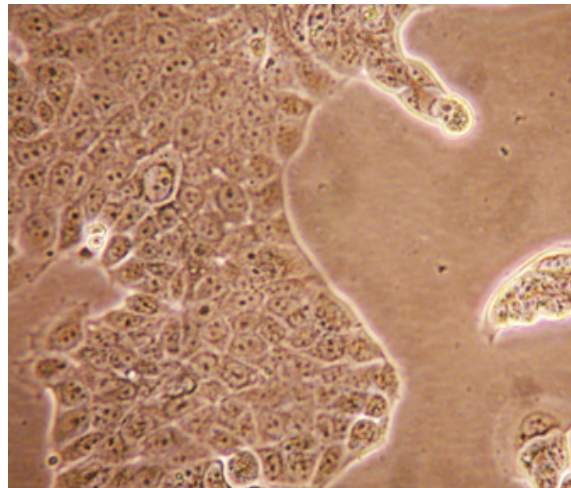
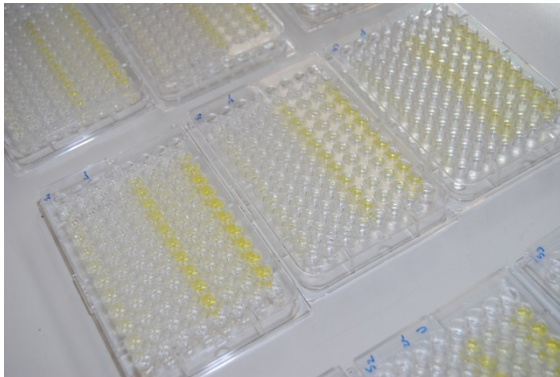
Effects of Flame Retardants *in-vitro*

Preliminary results of
INFLAME ESR10

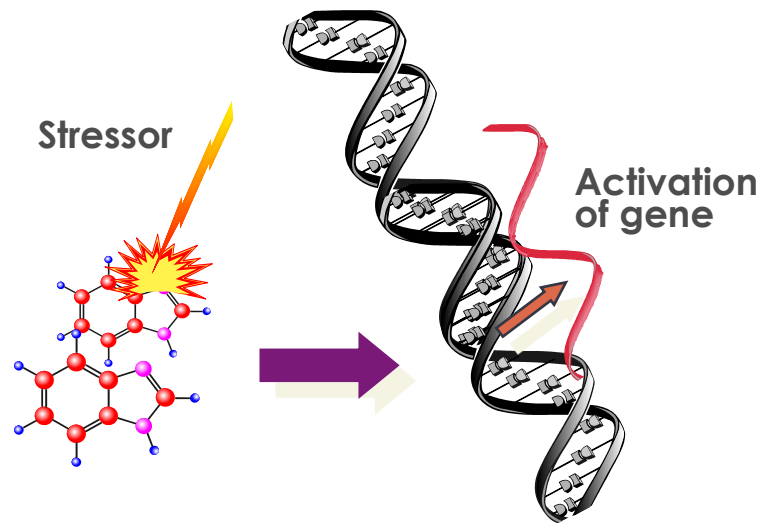
Maximilian Behr, Caroline
Vanparys, Ronny Blust

Methods

- Prokaryotic stress profile assay (Protox)
- Flow cytometric MCF-7 E-Screen
- Shotgun proteomics (MALDI-TOF-TOF, LTQ-Orbitrap MS)



Bacterial stress gene profiling



promotor:reporter constructs

Promoter

LacZ Reporter Gene

β -galactosidase activity determined spectrophotometrically (ONPG)

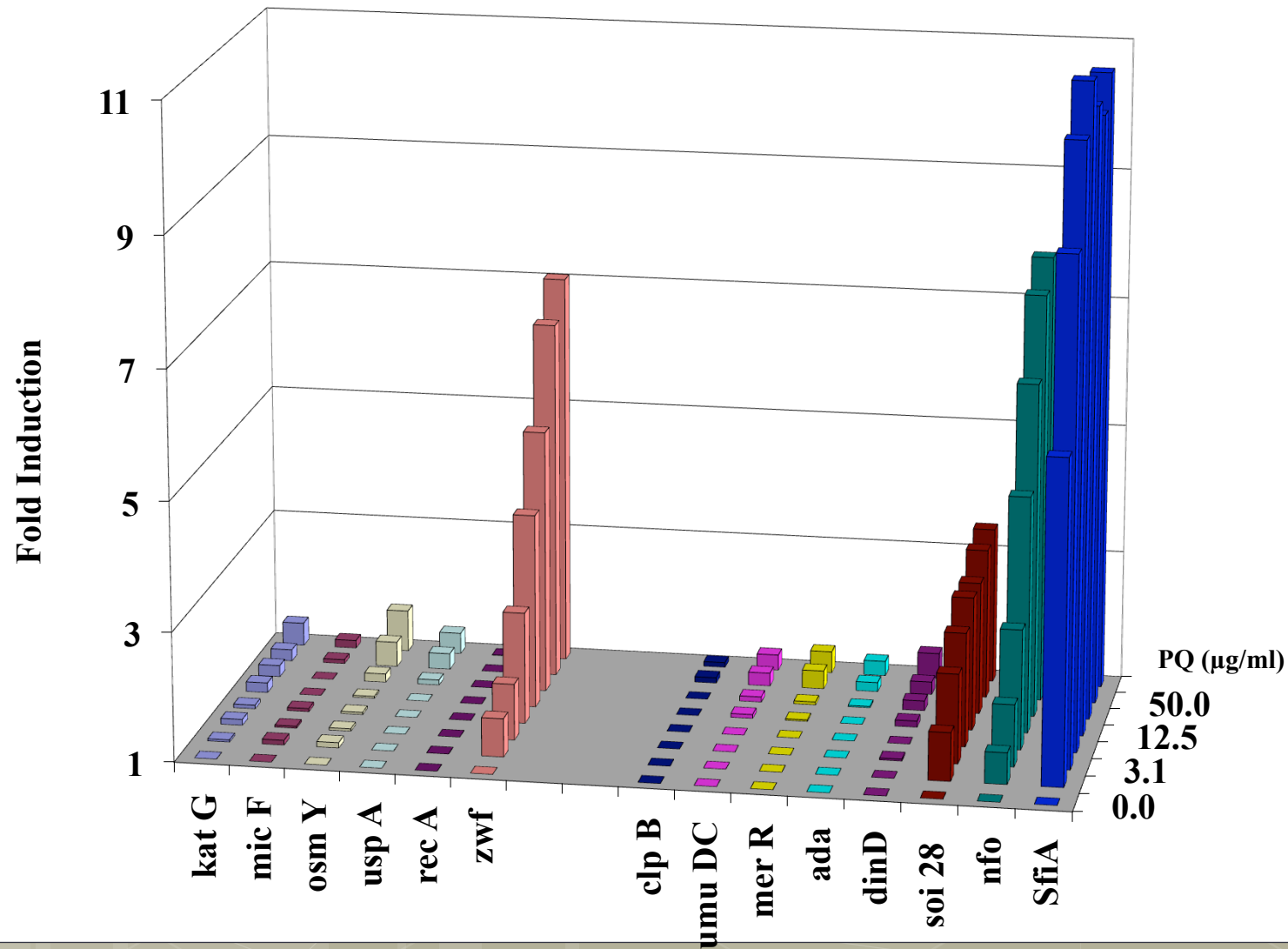
Stress trigger

Oxidative stress
Protein perturbation
DNA damage
Membrane effects
Cellular stress

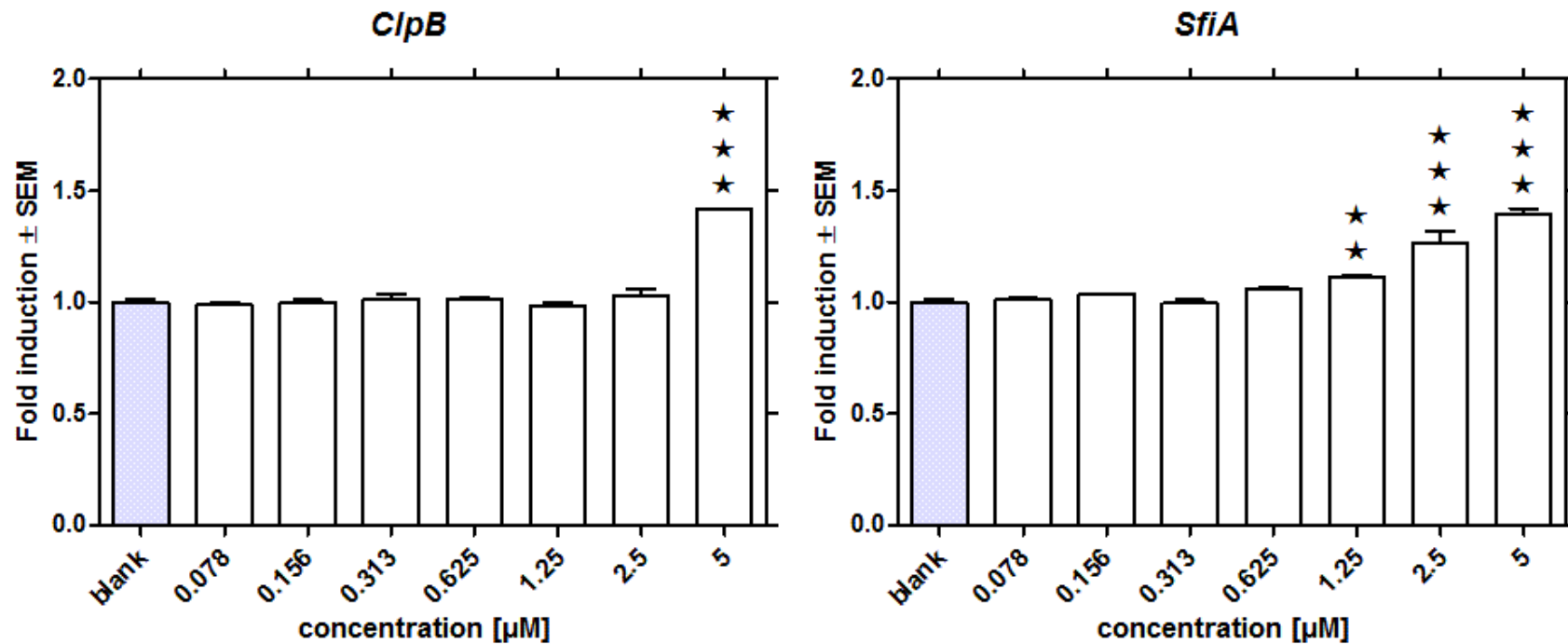
stress promoters

KatG, Zwf, Soi28, Nfo, MerR
ClpB
Nfo, RecA, UmuDC, Ada, PQ37, DinD
MicF, OsmY
UspA

Prokaryotic stress profile



Prokaryotic stress - TBBPA



★★: $p < 0.01$, ★★★: $p < 0.001$, one-way ANOVA, Dunnett's Multiple Comparison Test

Summary of stress effects

- ◉ **TBBPA:**

- ◉ protein perturbation (*ClpB*)
- ◉ SOS response (DNA damage) (*SfiA*)

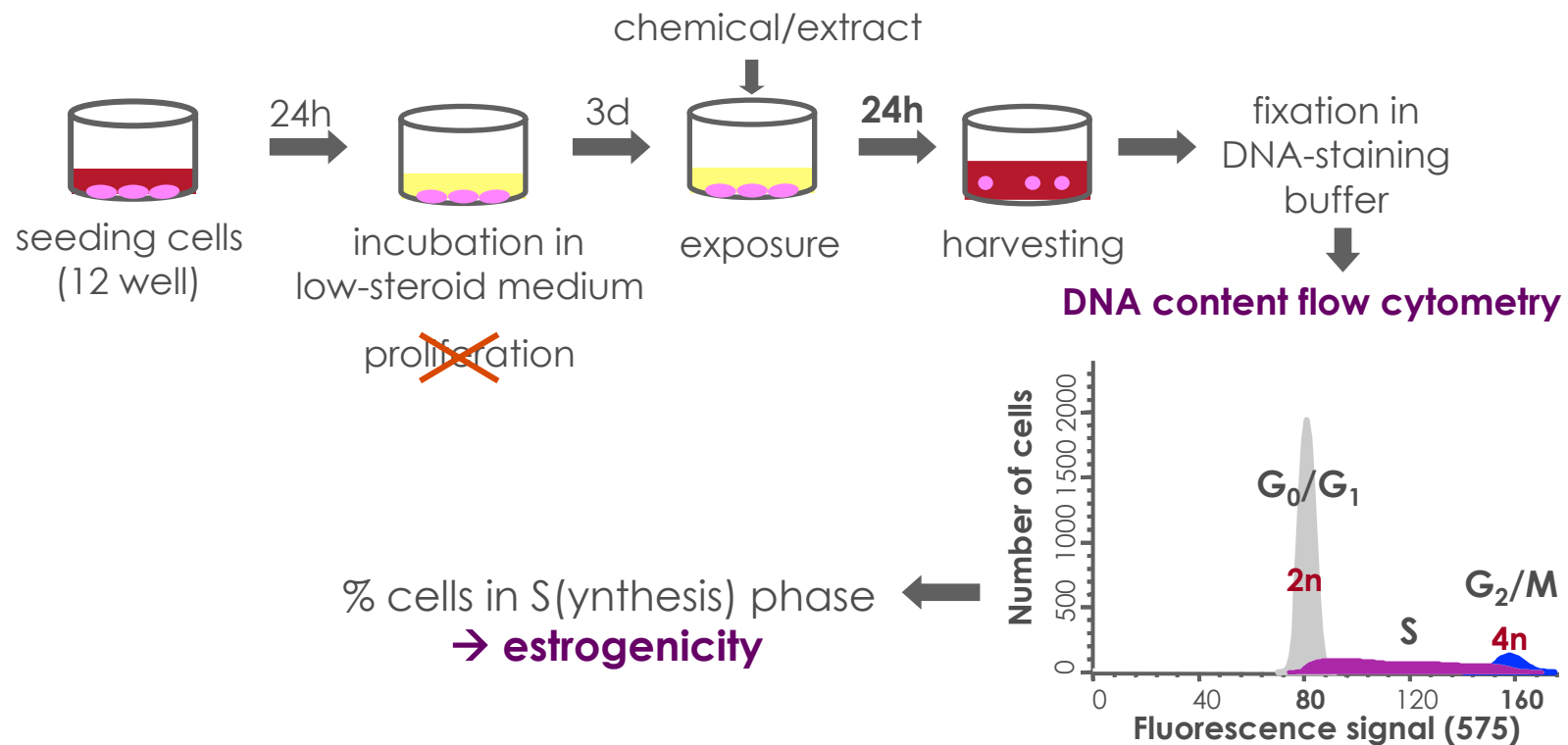
- ◉ **BDE 209:**

- ◉ no signs of general stress

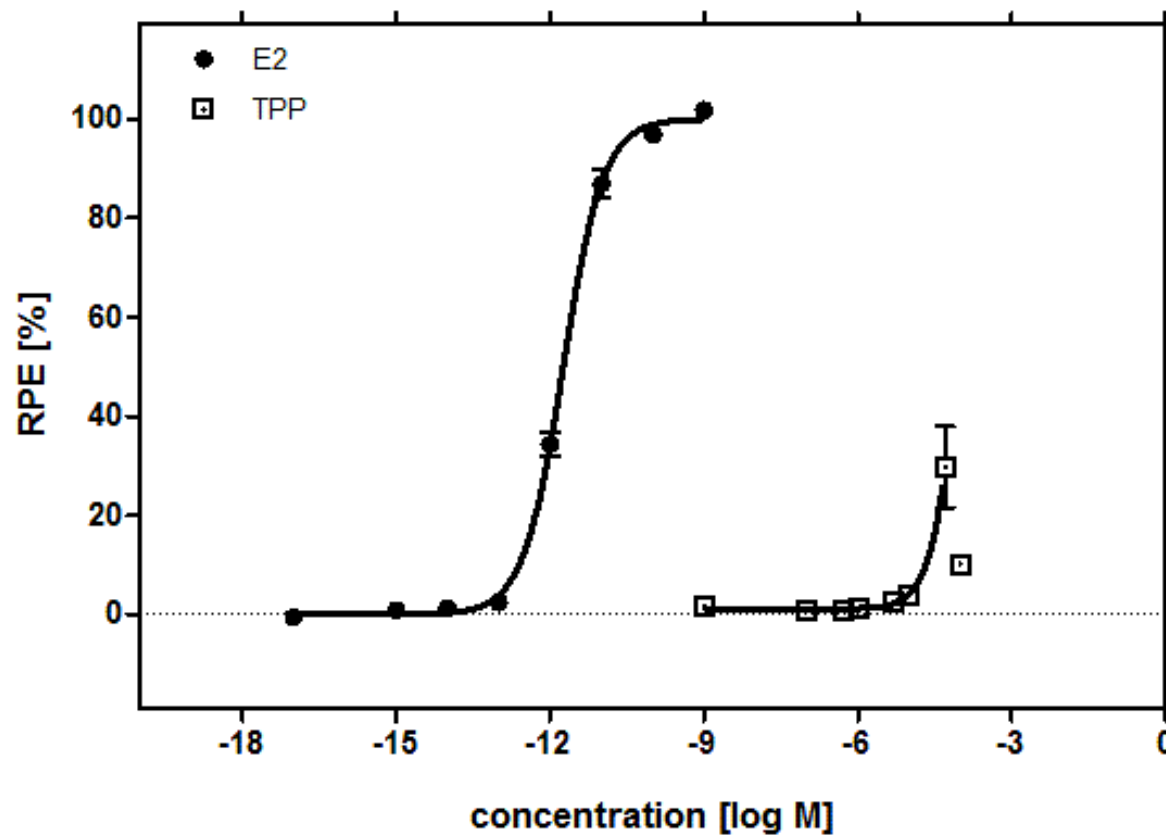
MCF-7 cell proliferation assay

= E-screen assay (Soto et al. 1995)

estrogen dependent proliferation of MCF-7 breast cancer cells

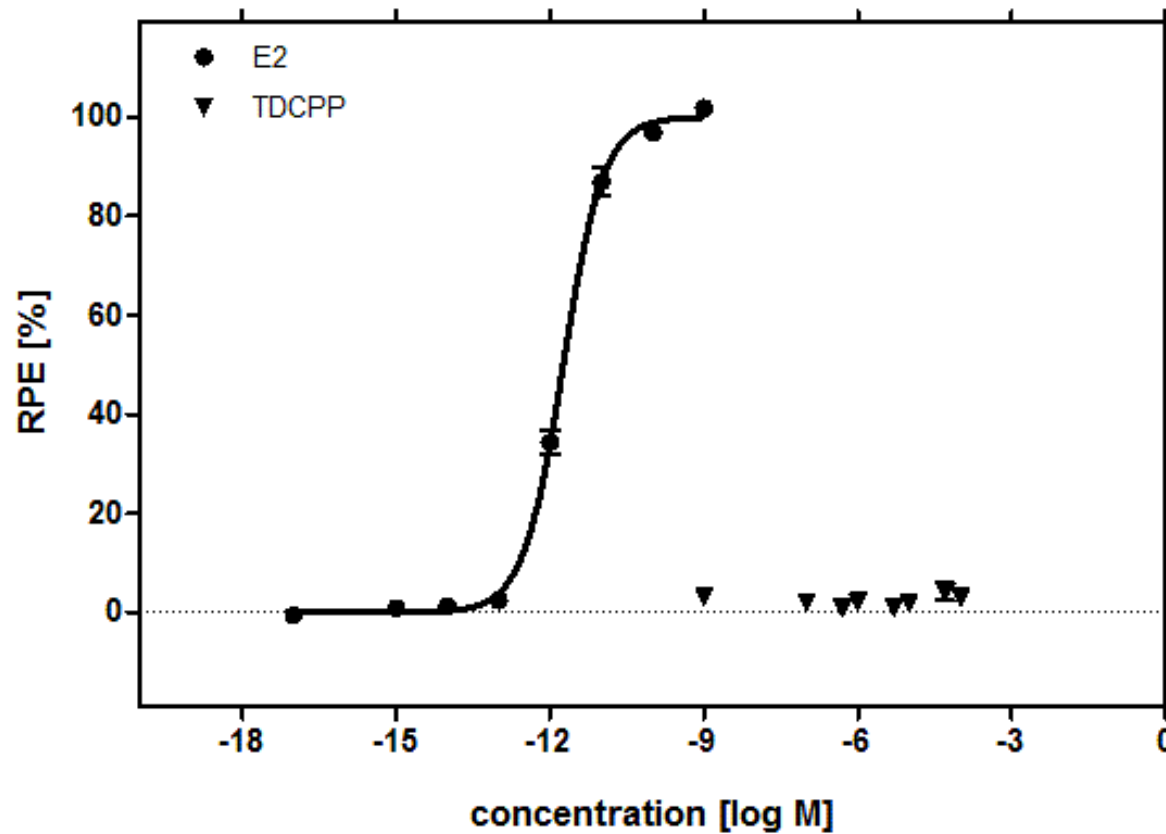


Endocrine activity of FRs

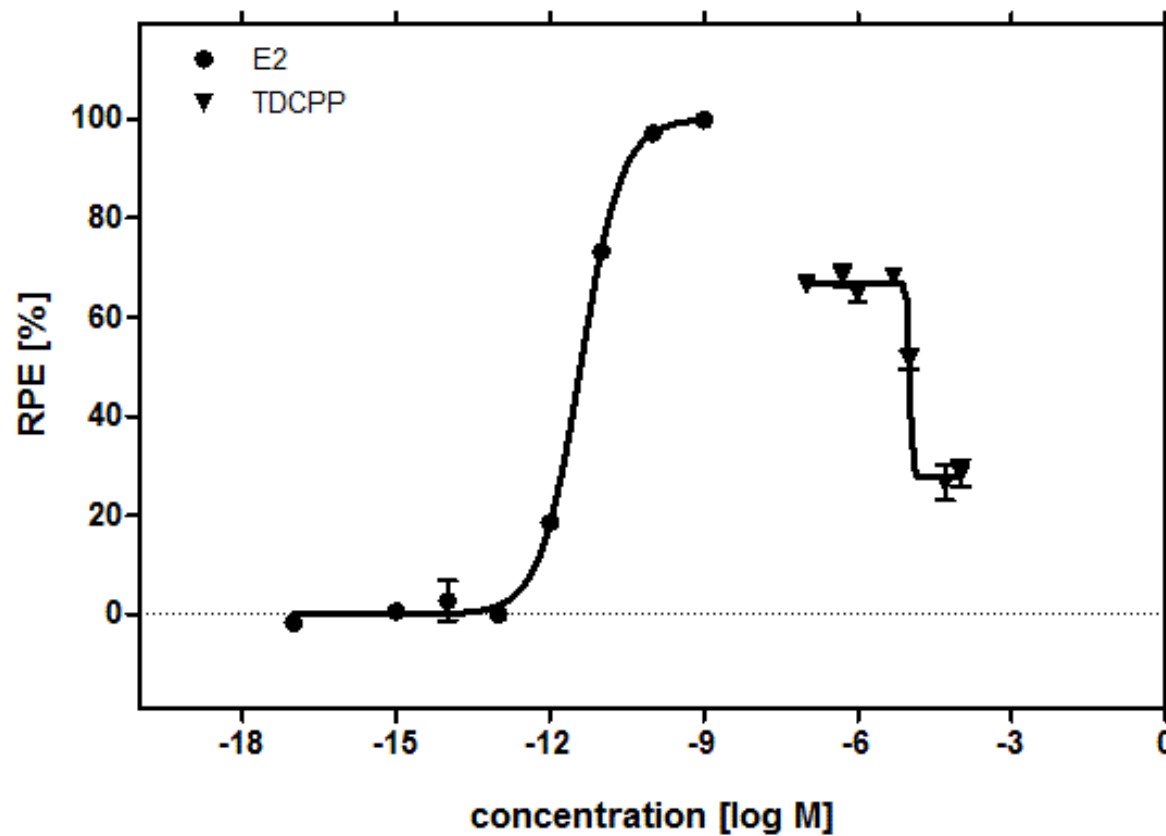


50 μ M: ★★★, $p < 0.001$, one-way ANOVA, Dunnett's Multiple Comparison Test

Endocrine activity of FRs



Endocrine activity of FRs



10 μ M: **, $p < 0.01$, 50 μ M/100 μ M: ***, $p < 0.001$ one-way ANOVA, Dunnett's Multiple Comparison Test

Summary of endocrine effects

	estrogenic	anti-estrogenic
TCPP	-	+
TDCPP	-	++
TBEP	-	+
TCEP	-	(+)
TPP	+	-
HBCD (technical)	-	-
HBCD (pure)	-	-
TBBPA	-	?

Endocrine effects in literature

Environ. Sci. Technol. 2007, 41, 8506–8511



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Investigation of cytotoxic, genotoxic, mutagenic, and estrogenic effects of the flame retardants *tris*-(2-chloroethyl)-phosphate (TCEP) and *tris*-(2-chloropropyl)-phosphate (TCPP) in vitro

SM

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BFRs are tetrabromobisphenol A (TBBPA), hexabromocyclododecane (HBCDD), and decabromodiphenyl ether (DeBDE), which together represent about 150 000 t or ~25% of

Perspectives

- ◉ Establish protocol for shotgun proteomics of cultured cells
- ◉ Set up collaboration with UB to create full “omics” profiles of our cell lines
- ◉ Repeat MCF-7 experiments
- ◉ Collaborate with Univ. Frankfurt to confirm MCF-7 results using the YES
- ◉ Create more prokaryotic stress profiles and verify current results

Thank you for your attention!

