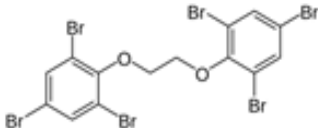
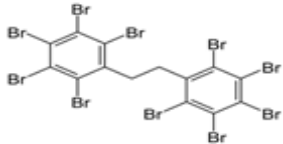


# Supplementary Materials: Investigation on sex hormone-disruption effects of two novel brominated flame retardants (DBDPE and BTBPE) in male zebrafish (*Danio rerio*) and two human cell lines (H295R and MVLN)

Jiwon Choi, Gowoon Lee, Sunmi Kim and Kyungho Choi

**Table S1.** Physicochemical properties of DBDPE and BTBPE.

Compound	Decabromodiphenyl ethane	1,2-bis(2,4,6tribromophenoxy) ethane
Synonyms	DBDPE	BTBPE
CAS No.	84852-53-9	37853-59-1
Structure		
Usage	Additive, textiles	ABS, thermoplastics, coating
Molecular formula	C <sub>14</sub> H <sub>4</sub> Br <sub>10</sub>	C <sub>14</sub> H <sub>8</sub> Br <sub>6</sub> O <sub>2</sub>
Molecular weight (g/mol)	971.22	687.64
LogK <sub>ow</sub>	13.64 <sup>1</sup>	8.31 <sup>2</sup>
Water solubility at 25°C (mg/L)	1.61×10 <sup>-12</sup> <sup>1</sup>	2.23×10 <sup>-4</sup> <sup>1</sup>

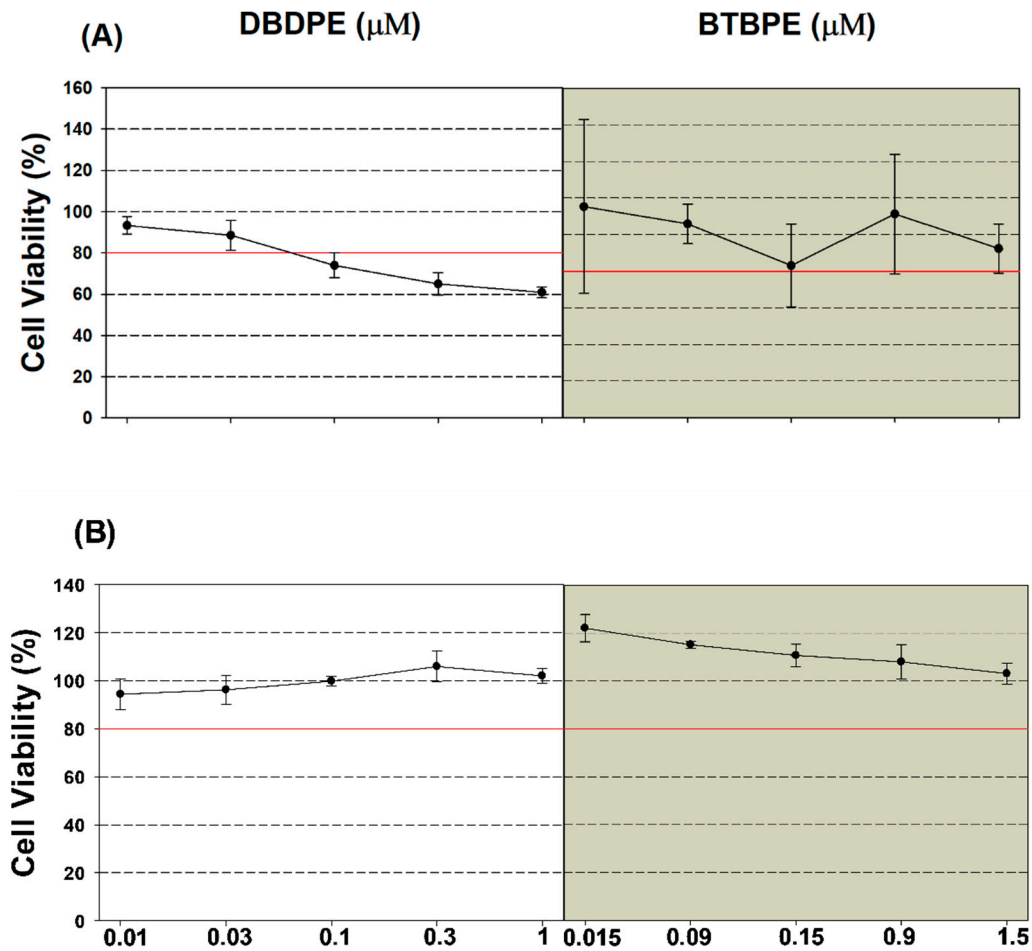
<sup>1</sup> US EPA 2012

<sup>2</sup> EFSA 2012

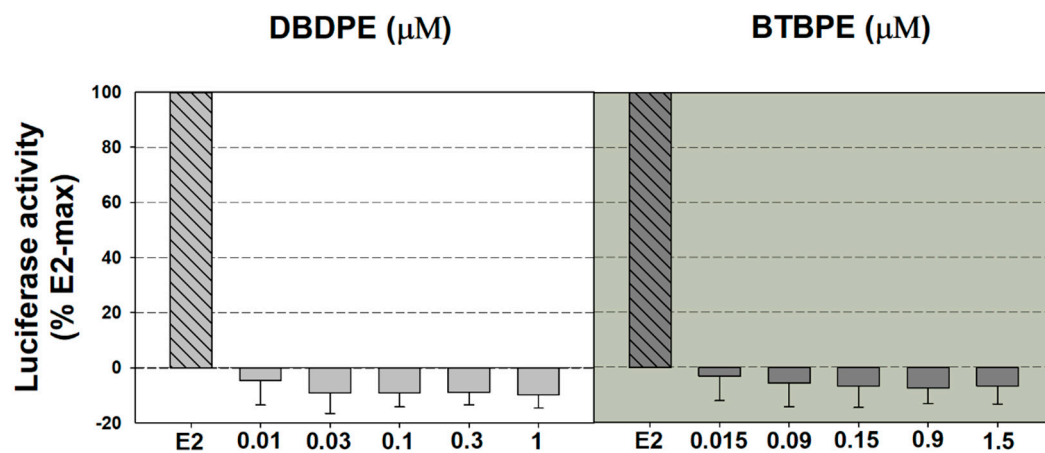
**Table S2.** Information of primer sequence of zebrafish and H295R cell lines used in the study.

Assay	Gene name	Accession No.	Description	Sequence (5'-3')
<i>In vitro</i> H295R	$\beta$ -ACTIN	NM_001101	Forward	CACTCTTCCAGCCTTCCTTCC
			Reverse	AGGTCTTTGCGGATGTCCAC
	STAR	NM_000349	Forward	GTCCCACCCTGCCTCTGAAG
			Reverse	CATACTCTAAACACGAACCCACC
	3 $\beta$ HSD	NM_000198	Forward	TGCCAGTCTTCATCTACACCAG
			Reverse	TTCCAGAGGCTCTTCTTCGTG
	CYP17	NM_000102	Forward	AGCCGCACACCAACTATCAG
			Reverse	TCACCGATGCTGGAGTCAAC
	CYP19	NM_000103	Forward	AGGTGCTATTGGTCATCTGCTC
			Reverse	TGGTGGAATCGGGTCTTTATGG
<i>In vivo</i> zebrafish	<i>rpl8</i>	NM_200713	Forward	TTGTTGGTGTGTGTGCTGGT
			Reverse	GGATGCTCAACAGGGTTCAT
	<i>vtg</i> <sup>1</sup>		Forward	AAGACCCCTGTCGTTCCAATC
			Reverse	AAACTCGTACTGCAGGGATCC
	<i>era</i>	NM_152959	Forward	CAGACTGCGCAAGTGTTATGAAG
			Reverse	CGCCCTCCGCGATCTT
	<i>er<math>\beta</math></i>	NM_174862	Forward	TTCACCCCTGACCTCAAGCT
			Reverse	TCCATGATGCCTTCAACACAA

<sup>1</sup> Sohn et al., 2016, This primer sequences were designed using Primer 3 online software ver.4.0.0 (<http://primer3.ut.ee/>)



**Figure S1.** Preliminary range finding of DBDPE and BTBPE. Cell viability of (A) H295R and (B) MVLN cell lines were measured by WST-1 assay. The cell viability (%) was normalized to relative of solvent control. The results are shown as mean  $\pm$  SD of triplicate (n=3).



**Figure S2.** Binding affinity of DBDPE and BTBPE with ER in MVLN cell luciferase assay. The results are shown as mean  $\pm$  SD of three of biological replicates.  $3.7 \times 10^{-4} \mu\text{M}$  of E2 is used as maximum luciferase value for the calculation.