CALUX®
Highlight

BDS
BioDetection Systems

TTR assay

Several compound classes are known to be able to interfere in thyroid hormone metabolism by disrupting the transport of the natural ligand thyroxine (T4) by a major transporter protein transthyretin (TTR). The TTR assay uses this important property to measure the effect of the range of PFAS compounds in chemical mixtures, independent of prior knowledge of their structure. The TTR assay consists of a TTR-binding assay in combination with the TRbeta CALUX bioassay. Disruption of TTR binding by T4 is benchmarked against the reference compound tetrabromobisphenol A and expressed as tetrabromobisphenol equivalents/g sample processed. Simple sample processing and clean-up is required, allowing successful application to a wide range of matrices.

Specification	TTR assay
Basal cell line	na
Species	human
Tissue	na
Positive control	tetrabromobisphenol A
Endpoint (pure compounds)	EC or PC concentration, lowest effect concentration (e.g. PC10)
Endpoint (mixtures)	Toxic equivalents in pg TEQ/g sample processed
Test duration	42hr (total sample processing time)
Specificity	Measurement of chemical or chemical-mixture-mediated TTR interference only.
Matrices	Any type of sample
Sample volume/mass	Matrix- and desired limit of quantification (LOQ)-dependent
Amount of compound	Typically 10 mg. Lower for high potency compound provided in DMSO
Assessment criteria	In house methods, compliant with relevant application/regulations.
SOPs and Guidelines	BDS internal
HTS protocol	Not available yet
Key reference	Collet B, Simon E, Van der Linden S, El Abdellaoui N, Naderman M, Man HY, Middelhof I, Van der Burg B, Besselink H, Brouwer A. (2019) Validation of a panel of in vitro methods for assessing thyroid receptor β and transthyretin transporter disrupting activities. Reproductive Toxicol., 18, 30554-30559