CALUX®
Highlight

BioDetection Systems

PFAS CALUX®

PFAS are known to be able to interfere in thyroid hormone metabolism by e.g., disrupting the transport of the natural ligand thyroxine (T4) by a major transporter protein transthyretin (TTR). The PFAS CALUX® 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 PFAS CALUX 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 PFOA and expressed as PFOA equivalents/g sample processed. Simple sample processing and clean-up is required, allowing successful application to a wide range of matrices.

Specification	PFAS CALUX
Basal cell line	na
Species	human
Tissue	na
Positive control	PFOA
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 PFAS-mediated TTR interference only. Ligand selection is made through compound class selective workup method, and TTR interference.
Assay interferences	Minimal because of use of purified TTR, highly pathway specific read-out.
Sensitivity (LOD/Q)	Total levels, typically in low µg range (matrix- and sample size-dependent)
Matrices	Any type of sample
Sample volume/mass	Matrix- and desired limit of quantification (LOQ)-dependent
Amount of compound	Typically 10 mg. Much 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	Behnisch P, Besselink H, Weber R, Willand W, Huang J, Brouwer A. (2021) Developing potency factors for thyroid hormone disruption by PFASs using TTR-TRβ CALUX® bioassay and assessment of PFASs mixtures in technical products. Environment International 157, 106791