

## TPO assay

Thyroid hormone synthesis in the thyroid gland is catalysed by thyroid peroxidase (TPO). Compounds that inhibit TPO activity prevent iodothyronine production in the thyroid gland. The luminol-based hTPO inhibition assay is based on the oxidation of luminol by hydrogen peroxide during which light is emitted. This reaction is catalysed by hTPO. In the presence of compounds inhibiting the hTPO catalytic activity, the amount of light emitted is reduced. Inhibition of hTPO catalytic activity is benchmarked against the relevant reference compound Methimazole (MMI)

Specification	TPO assay
Basal cell line	na
Species	human
Tissue	na
Positive control	Methimazole
Endpoint (pure compounds)	EC or PC concentration, lowest effect concentration (e.g. PC10)
Endpoint (mixtures)	Toxic equivalents in pg TEQ/g sample processed
Specificity	Measurement of chemical or chemical-mixture-mediated TPO 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	Ouedraogo G, Alexander-White C, Bury D, Clewell HJ 3rd, Cronin M, Cull T, Dent M, Desprez B, Detroyer A, Ellison C, Giammanco S, Hack E, Hewitt NJ, Kenna G, Klaric M, Kreiling R, Lester C, Mahony C, Mombelli E, Naciff J, O'Brien J, Schepky A, Tozer S, van der Burg B, van Vugt B, Stuard S, Cosmetics Europe (2022) Read-across and new approach methodologies applied in a 10-step framework for cosmetics safety assessment - A case study with parabens. Regul Toxicol Pharmacol. 2022 May 1:105161.