PLATEFORME PUBLIC-PRIVÉ
POUR LA PRÉ-VALIDATION
DES MÉTHODES DE CARACTÉRISATION
DES PERTURBATEURS ENDOCRINIENS
Pepper

Pepper launches validation of two new test methods to identify endocrine disruptors

Two new methods targeting the effects of endocrine disruptors on human health and the environment were selected by the Pepper Project Opportunity Committee on October 27, 2023. They address biological aspects for which we lack validated methods

Retinoid and PPARδ-dependent neurite outgrowth assay

Developmental neurotoxicity is a major health problem, with increasing numbers of children being diagnosed with learning and neurodevelopmental disorders. Endocrine disruption is one possible cause. However, there are currently very few methods for identifying developmental neurotoxicants. Most of them are based on the use of animals, and have been shown to lack sensitivity.

The chosen method, developed at Uppsala University (Sweden), is an in vitro method. It uses murine neuroprogenitor cells (C17.2) to study neuronal differentiation and neurite morphology by immunofluorescence microscopy via high-content imaging (https://doi.org/10.1371/journal.pone.0190066) and to determine whether the product acts via two endocrine pathways: retinoid and peroxisome proliferator-activated receptor delta (PPARδ).

Transthyretin (TTR) binding assay with FITC-labelled thyroxin (T4)

Disruption of the Thyroid function has been linked to various health issues, including reduced cognitive function. It has been demonstrated that the level of thyroid hormones during pregnancy affects the development of the foetus brain. A key role is played by the thyroid hormone distributor ***transthyretin*** *(TTR) which distributes the thyroid hormone to target tissues, including across the placenta and the blood-cerebrospinal-fluid-barrier. It is considered to be the most important thyroid hormone transporter.*

This method, developed by the Vrije Universiteit Amsterdam (Netherlands), measures the ability of a substance to displace T4 thyroid hormone from its transporter (transthyretin TTR) (https://doi.org/10.1289/EHP5911). It is based on the use of T4 labelled with a fluorescein compound (fluorescein 5-isothiocyanate: FITC) and the commercially available human TTR transporter protein. T4 displacement is measured by the decrease in light signal.