

Activity study of possible endocrine disruption via the TRb or PPAR γ 2 receptors by using CALUX cell systems

*Commonly used acronym: TRb and PPAR γ 2 CALUX
Created on: 03-05-2022 - Last modified on: 05-05-2022*

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
This method makes use of	Human derived cells / tissues / organs
Specify the type of cells/tissues/organs	U2-OS cells (human osteoblasts), stably transfected with the receptor and a luciferase reporter construct

DESCRIPTION

Method keywords

cell culture

CALUX

reporter gene assays

Scientific area keywords

Endocrine disruptors

obesogens

PPAR γ

TR β

mixtures

concentration addition

Method description

The CALUX[®] system (Chemically Activated LUciferase eXpression) of Bio Detection Systems (BDS, Amsterdam, the Netherlands) uses U-2 OS cells (human osteoblast) that are stably transfected with human TR β or human PPAR γ 2 (BDS, Amsterdam) and a luciferase reporter construct under the control of a receptor specific response element. Through measuring the activity of chemical compounds on these cell lines, we can determine if they can potentially have endocrine activity. The activity of mixture of chemicals can also be determined in these cell systems.

Lab equipment

Cell incubator,

Safety cabinet,

Fluorimeter.

Method status

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Speed (vs *in vivo* experiments),
Useful for prioritisation.

Challenges

Difficult to extrapolate to the *in vivo* situation because of Absorption, Distribution, Metabolism, and Excretion (ADME).

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Mertens, B, Van Heyst A, Demaegdt H, Boonen I, Van Den Houwe K, Gosciny S, Elskens M, and Van Hoeck E. Assessment of hazards and risks associated with dietary exposure to mineral oil for the Belgian population. *Food and Chemical Toxicology*, 2021, Volume 149

I Boonen I, Van Heyst A , Van Langenhove K, Van Hoeck E, Mertens M, Denison MS, Elskens M, Demaegdt H. Assessing the receptor-mediated activity of PAHs using AhR-, ER - and PPAR - CALUX bioassays. *Food Chem Toxicol*. 2020, 145:111602. doi: 10.1016/j.fct.2020.111602

Simon C, Onghena M, Covaci A, Van Hoeck E, Van Loco J, Vandermarken T, Van Langenhove K, Demaegdt H, Mertens B, Vandermeiren K, Scippo ML, Elskens M. Screening of endocrine activity of compounds migrating from plastic baby bottles using a multi-receptor panel of *in vitro* bioassays.

Mertens B, Van Hoeck E, Blaude MN, Simon C, Onghena M, Vandermarken T, Van Langenhove K, Demaegdt H, Vandermeiren K, Covaci A, Scippo ML, Elskens M, Van Loco J. Evaluation of the potential health risks of substances migrating from polycarbonate replacement baby bottles. *Food Chem Toxicol*. 2016, 97:108-119.

Demaegdt H, Daminet B, Evrard A, Scippo ML, Muller M, Pussemier L, Callebaut A, Vandermeiren K. Endocrine activity of mycotoxins and mycotoxin mixtures. *Food*

Chem Toxicol. 2016, 96:107-16.

Pereira-Fernandes A, Demaegdt H, Vandermeiren K, Hectors TL, Jorens PG, Blust R, Vanparys C. Evaluation of a Screening System for Obesogenic Compounds: Screening of Endocrine Disrupting Compounds and Evaluation of the PPAR Dependency of the Effect. PLoS One. 2013, 8 : e77481.

Associated documents

PARTNERS AND COLLABORATIONS

Organisation

Name of the organisation Sciensano

Department Chemical and physical health risks

Country Belgium

Coordinated by



Financed by

