CEC01: Thyroid hormones, brain development and toxicity testing

Chairs:

Marta Axelstad, Denmark | Manon Beekhuijzen, Netherlands | Barbara Demeneix, France

Programme:

10h00–10h30 Welcome coffee

10h30–10h45
Welcome by chairs

10h45–11h30
Thyroid Hormone Action and Disruption During Development: pregnancy, brain and rat versus human
Robin Peeters, Erasmus University Medical Center, Rotterdam, Netherlands

11h30–12h00
Low thyroid hormone during pregnancy and consequences for child neurological development
Peter Taylor, Cardiff University, Cardiff, UK

12h00–12h30
Safeguarding the thyroid system – developing an *in vitro* testing battery
Sharon Munn, European Commission, Joint Research Centre, Ispra, Italy

12h30–13h30
Lunch

13h30–14h00
Recommendations for the future: lessons learned from thyroid hormone determinations in OECD/ US EPA guideline studies
Abby Li, Exponent Inc., SanFrancisco, US

14h00–14h30
Searching for an adverse effect endpoint in the developing brain
Louise Ramhøj, Technical University of Denmark, Kgs. Lyngby, Denmark

14h30–15h00
Coffee break

15h00–15h30
Current guideline testing: what is still missing?
Manon Beekhuijzen, Charles River, Den Bosch, Netherlands

15h30–16h00
All speakers in a panel discussion with the audience

Abstract:

Thyroid hormones are crucial for proper brain development in all vertebrate species. A large number of environmental chemicals, including industrial chemicals, pesticides and biocidal products, have been shown be able to disrupt thyroid hormone regulation, through a variety of mechanisms. With the implementation of new criteria for identifying endocrine disrupting chemicals, these compounds have received considerable attention from both scientific community and regulatory authorities, revealing a number of unresolved questions. This Continued Education Course will from various angles explore recent advances in the field and pin-point where further actions and improvements are needed.

Dr. Robin Peeters (ERASMUS University) will introduce the area of thyroid disruption. He will present the different aspects of thyroid function during human brain development as well as introduce the topic of species differences between rat and human. His talk will be followed by a lecture by Dr. Peter Taylor (Cardiff University), who will present results of additional epidemiological studies relating thyroid function during pregnancy to brain function in children.

Sharon Munch (Joint Research Centre) will introduce the recent EU initiatives regarding regulation of thyroid hormone disrupters and present the EU-NETVAL (European Union Network of Laboratories for the Validation of Alternative Methods) initiative, to develop *in vitro* assays for the identification of modulators of thyroid hormone signaling and their implementation as guideline studies.

In the afternoon session, two lectures will present some of the challenges encountered in mammalian studies, investigating thyroid disruption and brain development. Abby Li (Exponent) will talk about the challenges related to measuring thyroid hormones in rodents during sensitive periods, as these measurements have recently been included into several OECD test guidelines. She will be followed by Louise Ramhøj (Technical University of Denmark) presenting ongoing global efforts aimed at searching for adverse effect endpoints in the developing rat brain.

The last lecture will be by Manon Beekhuijzen (Charles River) who will continue the discussion on current test guidelines and possibilities to improve these with the aim to assess thyroid hormone disruption and its downstream adverse effects. Hereafter all speakers will be invited for a concluding panel discussion with the audience.

From a theoretical toxicology training point of view, this course will provide the participants with improved knowledge within the fields of: Epidemiology, General and Organ Toxicity, Reproductive and Developmental Toxicology, and Developmental Neurotoxicology. Furthermore, important aspects of regulatory toxicology, risk assessment and alternative testing methods will be introduced.