Short Article

Environmental Toxicology 2018: Assessment of Androgen receptor agonistic/antagonistic effects on veterinary drugs by OECD in vitro assays

Hyun-Suk Oh*

ABSTRACT

It is expected that consumption of veterinary drugs will increase due to growing agriculture and aquaculture production, which have to meet the demands of expanding human population for food.However, the presence of several veterinary drugs residues in food-producing animals could cause potential endocrine disrupting effects on human. Therefore, Economic Co-operation and Development (OECD) has provided a standardized method to search the effect of chemicals on the endocrine system.

The aim of this study is to assess the androgen receptor (AR) agonistic/antagonistic effects on 22 veterinary drugs, which are used as anthelminthic for livestock by OECD in vitro stably transfected transcriptional activation assays using chines hamster ovary cell line, AR-EcoScreenTM(OECD TG458). Among the tested chemicals, three veterinary drugs were determined to AR agonist(Albendazole, Mebendazole amine, Thiabendazole) and antagonist(Cymiazol, Praziquantel, Triclabendazol) by OECD TG458. These data provide information about AR agonistic/antagonistic effects of veterinary drugs by OECD in vitro assays. Although these results may not correlate directly with risks to humans, it would be offer the basal scientific information about food, drug and cosmetic ingredients with safety management.

The World Health Organization defines an Endocrine Disruptor (ED) as a chemical substance or mixture that alters function of the endocrine system and consequently causes adverse health effects in intact organisms or their progeny or sub-populations. This widely accepted definition of an ED consists of three elements: the substance has to cause adverse health effects in intact organisms; it has to alter the function of the endocrine system and has to be a consequence. Consequently, to identify an ED by toxicity testing, it has to shown that an adverse effect would occur in vivo, observable in a test animal system, epidemiologically or clinically. It has to be demonstrated that the mechanism by which the substance is causing the adverse effect is endocrine and a plausible link between the adverse effect and the endocrine mechanism has to be established

This definition and its elements have been widely accepted and are the basis for the ED criteria set by the European Union. Since there are, several elements required to fulfill the definition no single test can demonstrate whether a substance is an ED.

REFERENCES

1. CengelogluY. ArslanG. TorA. KocakI. DursunN. 2008 Removal of boron from water by using reverse osmosis . Separation and Purification Technology 64, 141–146.
2. WHO/IPCS, Global Assessment of the State-of-the-Science of Endocrine Disruptors, 2002, Available online: http://www.who.int/ipcs/publications/new_issues/endocrine_disruptors/en/.
3. OECD Revised Guidance Document 150 on Standardised Test Guidelines for Evaluating Chemicals for Endocrine Disruption , 2018, Search PubMed .
4. R. Solecki , A. Kortenkamp , A. Bergman and I. Chahoud , et al., Scientific principles for the identification of endocrine-disrupting chemicals: a consensus statement, Arch. Toxicol., 2017, 91 , 1001 —1006 CrossRef CAS.
5. EU Commission, Commission Delegetad Regulation 2017/2100 setting out scientific criteria for the determination of endocrine-disrupting properties pursuant to Regulation (EU) No 528/2012 of the European Parliament and Council available at https://eur-lex.europa.eu/eli/reg_del/2017/2100/oj, 2017.
6. EU Commission, Commission Regulation (EU) 2018/605 of 19 April 2018 amending Annex II to Regulation (EC) No 1107/2009 by setting out scientific criteria for the determination of endocrine disrupting properties available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R0605), 2018.

National Institute of Food and Drug Safety Evaluation, Korea;

Correspondence: Hyun-Suk Oh, National Institute of Food and Drug Safety Evaluation, Korea

Received: December 03, 2021, Accepted: December 12, 2021, Published: December 24, 2021