

REMODELLING OF LCA COMPATIBLE ENVIRONMENT LOADING

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Abstract

Organizations that maintain the modern economy (companies, business organizations, social units) have the basic purpose of operating in order to make the highest profits, which is why they are looking for the key positions of production with which they can significantly reduce their expenses. A standardized method for tracking environmental pressures resulting from social activities is required, so our research team introduces the use of 1,4-dichlorobenzene as a model compound in its research protocols following the LCA standard.

Introduction

The system with the highest complexity known under terrestrial conditions is the human society, in which actors are able to transform the environment according to their particular needs, through cooperative action patterns. Thus, environmentally conscious social and organizational management has become a key and several methods of its implementation are known the Environmental Management System (KIR) [1]. KIR has made it possible to link the organization's objectives, which interpret the pursuit of economic efficiency with the need to maintain ever-increasing environmental safety [2]. The assessment of environmental problems characteristically addresses the economic aspects by which, in the current state of knowledge, it constantly iterates the methods of implementing the mandatory principle of continuity. In line with this logic, the need to optimize increasing use of the environment in a corporate environment is essential. In this context, society has created a set of standards that can be used for life cycle analysis (LCA), the International Standard 14040. The standard does not interpret the environmental emissions and environmental impacts and risks associated with a particular product as such, but it integrates them into environmental problems. Several methods of analysis are known, including acidification potential, ozone depletion potential, eutrophication potential, human toxicity potential [3]. Because of the variety of methods involved in presenting the results, our research team uses 1,4-dichlorobenzene (dCIB) as a reference compound linked to the LCA standard, as this agent may be useful in detecting the ecotoxic potential of substances. During the environmental cycle, chlorobenzenes can accumulate in plant and animal organisms. Exposure to chlorobenzene in the human population may occur during the production and use of chlorinated organic compounds. Their neurotoxic endocrine disruptor activity has been reported in numerous literatures [4, 5].

Aims

The aim of this present work is to develop a test model that conforms to the LCA standard so that the results obtained are comparable and reliable.

Methods

Prolactinomas adenohypophysis (AdH) was induced by subcutaneously administered estrone acetate (CAS registration number 901-93-9, Sigma, Germany; 150 µg / bw kg / week) for 6 months. Following pentobarbital anesthesia (4.5 mg / kg Nembutal, Abbott, USA), the animals were decapitated and the transformed AdHs were sterile removed under a preparative

microscope. Subsequently, primary monolayer cell cultures were prepared from the preparations. Cell cultures were treated with: Corticosterone (B): 1 $\mu\text{g} / \text{ml}$; AVP (arginine-vasopressin) 10^{-6} M ; + B + AVP: in combination, B was pretreated with AVP 20 minutes before treatment, 1,4-dichlorobenzene (dCIB): 0.1 ng / ml; chlorobenzene mix (mCIB): 0.1 ng / ml]; fenuron (PU) 10^{-6} M ; monuron (MU): 10^{-6} M ; diuron (DU) with 10^{-6} M agents.

Results and discussion

The human toxicity potential for dCIB effects is standardized by ISO 14040. Accordingly, we have introduced impact studies that underpin this standardization in our research. Data suggest that dCIB modulates ACTH secretion in the adenohypophysis and its prolactinomic transformation.

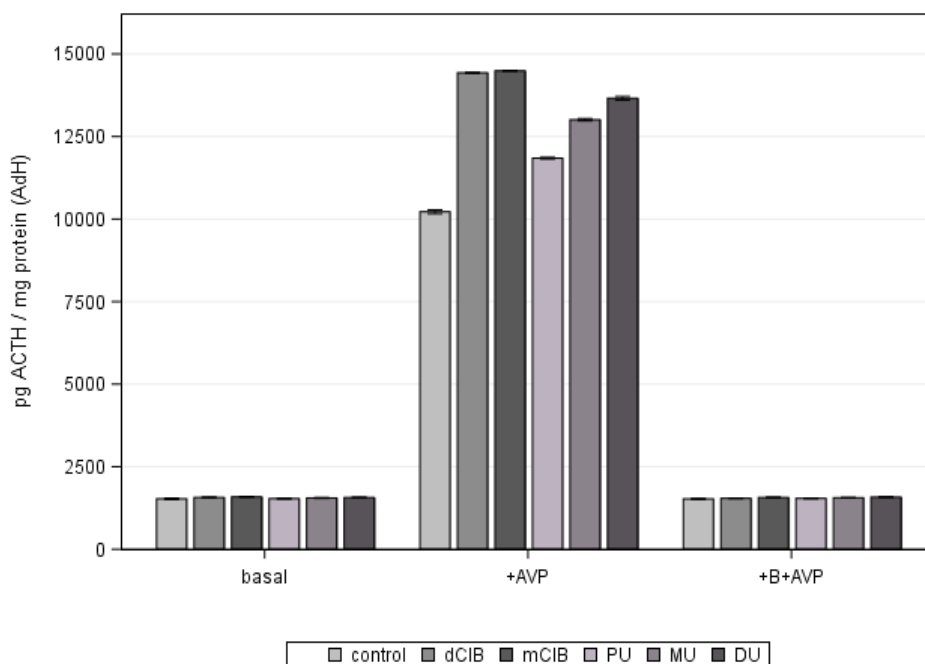


Figure 1. Effect of chlorobenzene and phenylurea treatments on ACTH secretion in normal adenohypophyseal cell cultures (mean \pm SEM, n = 6)

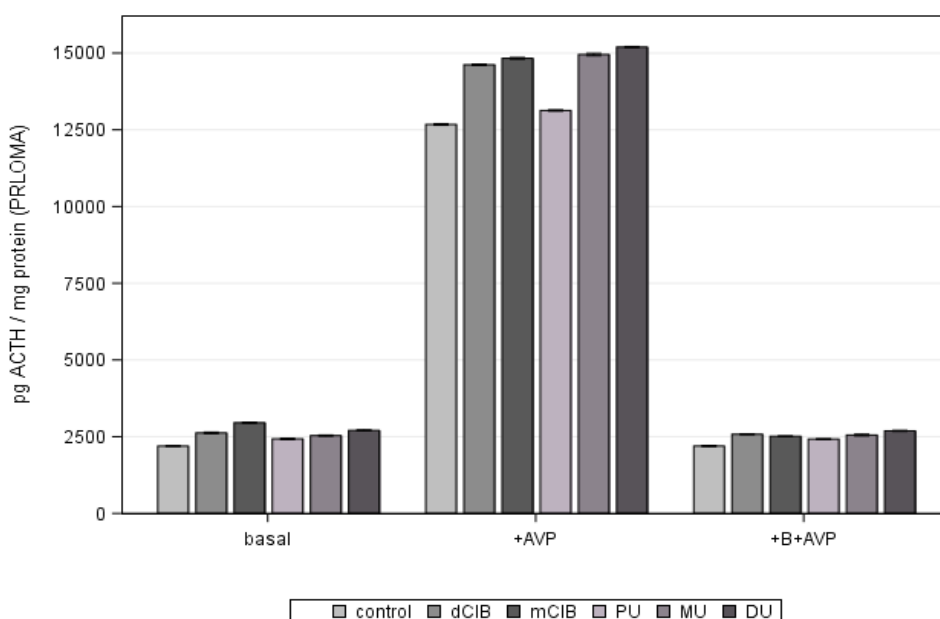


Figure 2. Effect of chlorobenzene and phenylurea treatments on ACTH secretion in prolactinoma adenohypophysis (PRLOMA) cell cultures (mean \pm SEM, n = 6)

Conclusion

It has been shown that both adenohypophysis and prolactinoma adenohypophysis in cultured cell cultures have primary endocrine disruptors in ACTH secretion. The human toxicity potential for dCIB effects is standardized by ISO 14040. Accordingly, we have introduced in our research the so-called standardization effect assays that characterize the endocrine disruptor compounds we study, so that the data become internationally comparable.

Acknowledgement

EFOP-3.4.3-16-2016-00014, EFOP-3.6.1-16-2016-00008, TÁMOP-4.2.4.A/2-11/1-2012-0001

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