

Analytica-2015 : Assessment of cytotoxic and endocrine potential of selected xenobiotics commonly present in food products - Katarzyna Owczarek - Gdansk University

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More and more increased intensity of anthropo-pressure processes can be observed, among other things, in the release of great quantities of synthetic substances into the environment, including the Endocrine Disrupting Compounds (EDC). A vast number of chemical substances are considered to belong to the this group, including substances which occur naturally in the environment, such as mycotoxins and phytoestrogens, and substances which have been artificially released to the environment as a result of human activities (synthetic hormones, growth promoters, phthalates, bisphenols, metals, pharmaceutical residues, organochlorine compounds including PCBs). Taking into account the plurality and chemical diversity of the aforementioned compounds, it should come as no surprise that these substances are almost ubiquitous in various elements of the environment and in the food chain, in which they are subjected to bio-magnification. These chemicals are mainly suspected to contribute to the induction of neoplastic diseases such as the breast and prostate cancer, metabolic diseases, including obesity, genetic modifications and impairment of reproductive functions. They are also suspected to have mutagenic and cytotoxic effects and that they disrupt regulatory pathways of some organs. That is the reason why all attempts to broaden the knowledge of relations and mechanisms triggering the development of relevant diseases are justified. The aim of the conducted research was to evaluate cytotoxicity and endocrine potential of selected EDCs which cause serious food contamination (bisphenol A, 4-nonyphenol, 4-t-octylphenol, diethylstilbestrol, bisphenol A diglycidyl ether and its derivatives and phthalates) with MTT and YES/YAS assays.

The enthusiasm for food toxicology is apparent by the reliance of mankind on nourishment by ethicalness of their heterotrophic digestion. By methods for present day organic chemistry, sub-atomic and cell science, software engineering, bioinformatics just as high-throughput and high-content screening advances it has been conceivable to distinguish unfavorable impacts and describe possible toxicants in food. The components of toxicant activities are multifactorial yet numerous harmful impacts join on the age of oxidative pressure and ceaseless irritation

bringing about cell demise, maturing and degenerative illnesses. Incorporation of food toxicology information got all through biochemical and cell-situated in vitro, creature in vivo and human clinical settings has empowered the foundation of option, exceptionally unsurprising in silico models. These frameworks use a blend of complex in vitro cell-based models with PC based calculations. As of now, toxicological testing of food contact materials (FCMs) is centered around single substances and their genotoxicity. In any case, individuals are presented to blends of synthetic compounds moving from food contact articles (FCAs) into food, and poisonous impacts other than genotoxic harm may likewise be pertinent. Since FCMs can be made of in excess of 8 thousand substances, evaluating them one-by-one is very resource-consuming. Additionally, completed FCAs ordinarily contain non-intentionally included substances (NIAS). NIAS poisonousness must be tried if a substance's compound personality is referred to and in the event that it is accessible as an unadulterated synthetic. Regularly, this isn't the situation. In any case, guidelines require security evaluations for all substances moving from FCAs, including NIAS, subsequently new ways to deal with meet this legitimate commitment are required. Testing the general move or concentrate from a FCM/FCA is a choice. In a perfect world, such an appraisal would be performed by methods for in vitro bioassays, as they are fast and cost-effective. Here, we survey the investigations utilizing in vitro bioassays to test poisonousness of FCMs/FCAs. Three primary classifications of in vitro tests that have been applied incorporate examines for cytotoxicity, genotoxicity, and endocrine disturbance potential. Furthermore, we looked into concentrates with little multicellular animal-based bioassays. Our outline shows that in vitro testing of FCMs is on a fundamental level plausible. We examine future examination needs and FCM-specific challenges. Test arrangement techniques should be enhanced and normalized. .

Biography:

Katarzyna Owczarek has completed her MSc studies in 2014 from Chemical Faculty Gdansk University of Technology. She started PhD studies on Department of

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