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Toxicogenomics in dissecting the BPA activity in endoderm derived organs

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Toxicogenomics accomplished to standard toxicology are considered a powerful method for low-dose endocrine disruptor compounds (EDCs) testing. In recent years, it has been developed a strong demand for reducing the use of small mammals in chemical testing. To meet this need, it is necessary to estimate the possibility of validly replacing them with cellular and no-mammal models. We explored this aspect investigating the activity of BPA as EDC in immortalized rat follicular cell line (FRTL-5), in primary pancreatic islets and hepatocytes, models for endodermal cells. In FRTL-5 environmental doses of BPA induce the transcription of thyroid specific genes and their transcriptional regulators. Furthermore, we highlighted the activation of NF-*kB* pathway in thyrocytes after BPA exposure. Basic on our data, we developed a reporter cell line able to sense BPA at very low concentrations. By gene expression analysis, we revealed that thyrocyte transcriptome reacts dynamically to low-dose BPA exposure. Particularly, we uncovered its capability to weaken cellular response to a further stress factor. Environmental exposure to BPA does not impact hepatocyte transcriptome. On the other side, the expression of few genes is altered in ex-vivo cultured pancreatic islets, leading to impairment of mitochondrial activity and apoptosis. Also in this case, the experimental activity highlighted that BPA exposure can alter cells ability to respond to damages. Overall, we propose new mechanisms for BPA toxicity that are exerted, exclusively, in presence of further stressors. This observation suggests revisions in the development of experimental plans including multiple exposure conditions.

Biography

Danila Cuomo is a PhD student in Science for Environment and Health at University of Sannio in Italy. She is performing her research activity in the Prof. Ambrosino Systems Toxicology Laboratory at Biogem in Ariano Irpino. In spring 2015, she was a research scholar at Health Science Center of Texas A&M University in College Station, TX. Her work aims to investigate the impact of environmental issues on endocrine system. Recently, she is focusing on reproductive health. Using OMICS approaches, she aspires to identify novel biomarkers detectable in human fluids, useful to predict reproductive diseases, such as premature ovarian aging.

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