



University of Naples Federico II
Department of Pharmacy
International PhD course in
Nutraceuticals, Functional Foods and Human Health



PROJECT TITLE: DIETARY EXPOSURE TO ENDOCRINE DISRUPTORS: IMPLICATIONS FOR LUNG AND ENDOCRINE HEALTH

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Endocrine-disrupting chemicals (EDCs) are exogenous substances capable of interfering with hormone biosynthesis, metabolism, and signaling, thereby altering physiological homeostasis. Among the most prevalent sources of human exposure to EDCs are dietary contaminants, particularly those leached from food packaging materials, including plastics, epoxy resins, and metal can linings. Compounds such as bisphenol A (BPA), phthalates, and nonylphenols have been detected in a wide range of packaged foods and beverages, raising concerns about chronic low-dose ingestion and its systemic effects.

Recent research has increasingly linked dietary exposure to EDCs with adverse outcomes in both the endocrine and respiratory systems, particularly in early developmental stages. BPA and related compounds exhibit estrogenic or anti-androgenic activity and have been shown to disrupt hormone-regulated pathways critical for lung development, immune modulation, and inflammatory responses. Experimental models and epidemiological studies suggest that such exposures may contribute to the pathogenesis of childhood asthma, airway hyperresponsiveness, and altered pulmonary immune profiles.

Given the hormone responsiveness of pulmonary tissues and the essential role of sex steroids and other endocrine factors in lung maturation and function, the interaction between EDCs and respiratory health warrants further investigation. Moreover, in the broader context of climate change and increasing environmental pollution, cumulative exposures from dietary and atmospheric sources may act synergistically, compounding the risk of chronic non-communicable diseases. Understanding the mechanistic pathways and long-term health consequences of dietary EDC exposure is essential for developing effective public health strategies aimed at reducing exposure, particularly during critical windows of vulnerability such as gestation and early childhood.

In conclusion, this project aims to elucidate the mechanistic and causal relationship between dietary EDC exposure and the pathogenesis of asthma. The study will focus on the immune-inflammatory pathways that underline airway dysfunction, allergic sensitization, and the development of asthma, thereby contributing to our understanding of EDCs as key environmental risk factors for respiratory diseases.

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