

PROJECT TITLE

Validation of New Models for Endocrine/Immune Risk Assessment

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Project description (259 words)

Bioactives, additives, and active pharmaceutical ingredients are used by various industries to characterize the marketed product, improve its properties, or facilitate certain stages of production, sometimes without being present in the final product. Some substances, even if allowed by current regulations, are suspected endocrine disruptors and may negatively affect human health by altering the function of the endocrine system. The impact on health is partially known, but uncertainties remain concerning a full risk characterization. The project aims at investigating the toxicity of substances belonging to different chemical classes, used in cosmetics, pharmaceuticals, and/or foods, which are of emerging concern (Contaminants of Emerging Concern, CECs). Some chemicals, contained in personal care products — such as skin lighteners and sunscreens (1) — attracted attention of scientific community due to their potential absorption through the skin, the largest organ of the body. In this project, besides traditional chromatography, biochromatographic techniques and in vitro experiments on cell cultures will be employed. Bio chromatography, using biomimetic stationary phases (sphingomyelin, phosphatidylcholine, cholesterol, and/or proteins), is considered a predictive tool for the crossing of molecules through biological barriers and for their toxicity (2,3,4). At the same time, systems evaluating skin absorption will be used, both traditional skin permeation system (Franz diffusion cells) and through new system such as Permeapad®. The latter features high-performance membranes, and it is already validated for nasal and buccal membrane passage (5,6). Permeapad® has been demonstrated to provide a better reproducibility compared to traditional experiments performed on animal/human skin, therefore playing an important role in the challenge of a more sustainable and ethical research.

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