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Editorial

Special Issue "Current and Evolving Practices in the Quality Control of Cosmetics"

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Quality Control (QC) testing of Cosmetic personal care and fragrance products is a key part of the products' launch to the market. The purpose of QC is to ensure that the product is stable, safe and that its claims are substantiated by scientific data.

Kirkbride et al. [1] critically evaluated current stability QC testing guidelines and techniques based on their industrial experience; they highlighted that the development of reliable stability testing protocols requires a consideration of the product's overall life-cycle and its intended use, concluding that there is a need for product-specific stability strategies.

Barthe et al. [2] provided a comprehensive review of all current in vitro and ex vivo techniques that have replaced the animal studies for the safety QC testing of cosmetic products and cosmetic ingredients. Such techniques include cell culture models, human skin equivalent models and excised human skin. The advantages, challenges and areas for development of these in vitro techniques are discussed in detail, focusing on the safety assessment for genotoxicity, endocrine disruption, dermal absorption, skin and eye irritation.

Steinmetz et al. [3] argued that the ban on animal testing has presented significant challenges in the toxicological safety determination of cosmetic ingredients, especially for those raw materials which are mixtures of plant/botanical extracts with complex chemical compositions. They explain new testing approaches such as the Mode of Action (MoA)-driven testing/analysis and the Threshold of Toxicological Concern (TCC) methodology.

Rakusa and Roskar [4] reported a novel HPCL-UV method for the quantitative QC testing of three actives; Vitamin A, Vitamin E and Coenzyme Q10. The QC testing of commercial anti-ageing products using this novel method revealed labelling discrepancies for these three actives, with actual active concentrations significantly higher or lower than stated. This finding highlighted the need for stricter regulations and quality control testing for active ingredients in cosmetic products.

Andreou et al. [5] elaborated on the safety of tattoo and permanent make up (PMU) colourants. They argue that although there has been a strict quality control of pigment raw materials in recent years, the long-term health risk and toxicological hazards of tattoo inks and PMU colourants need to be further investigated considering that these ingredients are not applied to the skin surface for decorative purposes but are injected into the dermis and reach the systemic circulation.

Biskanaki et al. [6] studied the differences in the expression and quality of skin collagen type -1 (COL I) in healthy, aged, sun exposed, and pathological skin tissues. They observed that sun-exposed skin demonstrates decreased and non-homogeneous COL I expression, which resembles the defective COL 1 expression of benign and cancerous skin lesions. This reinforces the benefits of using skincare products with a sun protection factor.

Claim substantiation testing is unique to cosmetic products. To enable time- and cost-effective quality control testing, assessment methodologies are constantly evolving. In the study conducted by my research group [7] we reported a novel QC method for the determination of refractive indices of creams, using an SPF meter. The RI values then presented the correlation with preliminary skin hydration data after the application of the

Citation: Dodou, K. Special Issue "Current and Evolving Practices in the Quality Control of Cosmetics". *Cosmetics* **2021**, *8*, 100. https://doi.org/10.3390/cosmetics8040100

Received: 8 October 2021
Accepted: 26 October 2021
Published: 29 October 2021

creams. Such correlations of instrumental data with sensory testing data, can be reliable & cost-effective predictive tools for the cosmetics industry during the initial stages of a product's development.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The author declare no conflict of interest.

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