Latest Skin Care Developments Analysed

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Introduction

Traditionally skincare products were relatively simple vehicles designed to deliver moisture to the skin and overcome dryness. Claims were few and far between and the ingredients functional but basic. As time has progressed our understanding of the skin's structure has improved dramatically, opening new doors for targeted skincare products delivering real benefits and treating consumer needs. Modern skincare products not only address specific skin issues such as hydration, sebum control, minimising pores etc but may also be aimed at e.g. specific age groups. Alongside the development of intricate formulations we have also developed methods and techniques for quantifying the changes and improvements modern products have upon the skin, allowing strong claims to be made and to be backed up with robust scientific data. Today's skincare products are complex formulations containing a multitude of advanced ingredients and making increasingly complex claims. The aim of this article is to review some of the newer avenues being explored in skincare and detail some of the related scientific literature which underpins them.

Appearance

One of the largest areas of research and recent launches has been concerned with ensuring that consumers have a perfect appearance. Products may claim to increase radiance and brightness, improve skin grain and smooth the complexion. This results in a natural look allowing the skin's positive attributes to shine through, ensuring a healthy glow and perfect complexion. As the line between skincare and colour cosmetics becomes increasingly blurred[1] and actives feature more and more in colour products, impacting the appearance has become of major importance.

Measuring the appearance of skin is a complex problem as the interaction between light and the skin is multifaceted. When visible light hits the skin some of the light is reflected directly back from its surface as mirror like or specular reflection, whereas other light is transmitted into deeper skin layers resulting in diffuse reflectance from subsurface scattering[2,3]. Sebum levels increase the specular component resulting in shine; attenuation of UV and visible light is principally by melanin and the blood chromophores haemoglobin and bilirubin influence dermal absorption of wavelengths longer than 320nm. Scattering by collagen fibres largely determines to what depth the light will penetrate and profoundly modifies skin colour [2,4]. Multi-angle measurements should be undertaken due to the multiple reflections produced by the back scatter. Non-contact methods are preferred, as touching the skin results in blanching which ultimately alters the appearance and data quality.

A measurement device to quantify skin radiance has been developed and validated by the group of Professor P Humbert[5]. This resulted in the definition of three parameters for radiance measurement (Complexion/diffusion, Complexion/reflection and Complexion/specular) and concluded that the forehead was the optimum site for measurement. Cross-polarised light techniques can be used to remove the specular component when measuring the colour photographically but has the drawback of almost totally removing surface features such as roughness. The Visia™ system from Canfield scientific (www.canfieldsci.com) allows for accurate and reproducible photographs to be captured which can then be analysed to generate complexion information. L'Oreal published a paper earlier this year detailing the use of this device to investigate the relationship between colour and age perception, concluding that chroma, lightness and the local light diffusing ability of the skin were the three main optical parameters which influence how old we appear[6]. Appearance and complexion may also be scored using sensory analysis and expert assessors, leading to the publication of a C.L.B.T.™ method (Colour, Luminosity, Brightness and Transparency)[7].

Colour imaging techniques have been used extensively to understand how the colour of the skin and other macro parameters such as wrinkles, pores, surface roughness etc can influence our perception of a person's age and attractiveness. Long *et al*. presented a poster at the 2008 IFSCC Congress in Barcelona entitled "A Technique for the Assessment of the Appearance of Age"[8] investigating the effect the application of a foundation product had on how old volunteers were perceived to be. The poster detailed how the level of colour