

Abstracts

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Image Analysis of Skin Color Using Independent Component Analysis and Its Application to Melanin Pigmentation Analysis

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Skin color has conventionally been analyzed by using colorimetric values such as CIE 1976 L*a*b*. Recently, several researchers have reported on extraction techniques of melanin and hemoglobin components from skin color information. One of our recent studies on a practical skin color analysis technique is introduced for evaluating melanin pigmentation, such as freckles. The skin color image is analyzed and separated into hemoglobin, melanin and shading components using the independent component analysis. We propose practical measurement systems and describe the results on the seasonal changes and age-related changes of pigmentations, as well as the changes after use of whitening essence.

The Stabilization Technology of Superfine Liposome

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Generally, hydrophilic surfactants are added to make a small particle size liposome. However, there is a problem that a small particle size liposome causes a decrease of its

capacity in the internal water phase, and it cannot function well enough as a capsule. Therefore we investigated the effect of various surfactants and lipids on superfine liposome. Firstly, we examined some hydrophilic surfactants which have different molecular structures to minimize the liposomes. PEG-25 phytostanol ether was most effective to make particle size small among nonionic hydrophilic surfactants. However, as the particle size got smaller, its capacity in the internal water phase decreased, being transformed into the micelles. Secondly, we tried to increase the capacity of the internal water phase by adding the combined lipid into the liposome membrane. It was indicated that phytosterol had the potential to increase remarkably the internal water phase. As a result, we found that it's possible to make a liposome of a small particle size having a large capacity in the internal water phase by using both PEG-25 phytostanol ether and phytosterol. Furthermore, the superiority of the liposome which consisted of the above ingredients in electrolyte-resistance was confirmed.

Development of Quantitative Analysis for the Micro-Relief of the Skin Surface Using a Video Microscope and Its Application to Examination of Skin Surface Texture

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We developed a new analyzing method for characterizing a

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skin surface morphology image obtained easily by a video microscope. For the numerical analysis of various characteristics of the skin surface morphology, three parameters were invented; "the width of the skin furrows," "the fineness of the skin ridges," and "the size of the skin pores." The width of the skin furrows was calculated as mean width of the skin furrows. The fineness of the skin ridges was calculated as number of the skin ridges. The size of the skin pores was calculated as total area of skin pores. The analyzed parameters were compared with the clinical scores evaluated by trained experts, resulting in a high correlation ($r=0.54$ to 0.72). Upon the age related changes in the parameters described above, the number of the skin ridges decreased at around the age of 20, and the size of the skin pores became large with aging during the teens through 40's. In the analysis of seasonal changes, the ridge parameter was high in summer, and the furrow parameter was high in winter. Upon the relationship between the images (the skin surface patterns) and the skin physiological parameters, the skin with a low barrier function (high TEWL) or that with high sebum content gave a low density of the skin ridges. From these results it seems that the image analysis of skin surface morphology using a video microscope is quite useful for an easy and simple evaluation of skin condition.

Evaluation of Effects of Hydroquinone on Pigmentation by Spectroscopy Image Analysis

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Generally, depigmentation efficacy is evaluated by analyzing the L^* value of skin to which the objective agent has been applied. However, in this method, slight inflammation and blood circulation affect the brightness, and then disturb the evaluation. So novel method that is able to quantitate melanin coloration accurately has been required. In this report, we modified the image-processing method that was devised by Takiwaki et al. Our method can evaluate pigmentation degree and area quantitatively. Using this method, we evaluated the availability of hydroquinone agent, which has high whitening effectiveness clinically; in addition, we examined the validity of this method.