

〈資 料〉

## セルフ-リサイクルに向けたヒト毛髪タンパク質からの 個人対応材料の開発

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### **Development of Personalized Materials from Human Hair Proteins for Self-recycle**

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#### **Abstract**

Human hair and nail are valuable materials for producing individual corresponding biocompatible materials. A rapid and convenient protein extraction method (Shindai method) was developed for quantifying human hair components. Novel procedures were also developed for preparing human hair protein films (Pre-cast, Post-cast, and soft Post-cast methods). The light brown films obtained by the soft Post-cast method became translucent after drying. The films reinforced with cotton gauze made it possible to apply them on human skin for at least 5 days. We utilized gellan-chitosan polyion complex (PIC) system to prepare the PIC hybrid fiber introducing hair proteins without any significant protein degradation or chemical modification. Hair protein particles were also conveniently prepared from the wet protein films. The average diameters were 1-21  $\mu\text{m}$  depending on the film formation methods and mechanical stimuli. Similar results were obtained from human nail proteins as well as hair proteins, indicating that they could be a self-reusable resource for various products. These results suggested the possibility that some skin troubles such as skin roughness, atopic dermatitis, inflammation will be solved by use of self-originating bio-material products instead of synthetic or non-self originating materials.

**Key words:** human hair, personalized material, film, fiber, particle, tailor-made product.