



Numerical Simulation of Skin Formation: Modeling of Scale Peeling

Shu Oba¹ and Katsuya Nagayama^{1,*}

¹Kyushu Institute of Technology Graduate School, 680-4, Kawazu, Iizuka, Fukuoka, 820-8502, Japan

*Corresponding Author: nagayama@mse.kyutech.ac.jp, Tel & Fax 81-948-29-7778

Abstract. Skin is formed by cell division, and the cells eventually mature into corneums and drop off. This process is known as turnover. With normal turnover, skin disease rarely occurs. However, the disturbance of turnover leads to skin inflammation and associated effects such as scale formation. As the mechanism of scale formation is unclear, this study analyzed the cause of scale formation in atopic dermatitis using a numerical simulation. The numerical simulation model of the skin was constructed by theoretically setting the main parameters (e.g., transepidermal water loss *TEWL*) of atopic dermatitis, thereby allowing the elucidation of the mechanism of scale formation. As a result, thick corneum and scale of atopic dermatitis was successfully modeled. In addition, the variation of desmosome distribution in stratum corneum was shown to be associated with scale formation.

Keywords: scale, atopic dermatitis, skin, desmosome, stratum corneum.