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## **Stratum corneum model membranes : molecular organization in relation to skin barrier function**

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Cover image: Gothic bell tower of the church of St-André in Grenoble, France (1298).

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# Stratum corneum model membranes: molecular organization in relation to skin barrier function

## **Proefschrift**

ter verkrijging van  
de graad van Doctor aan de Universiteit Leiden,  
op gezag van Rector Magnificus prof. mr. P.F. van der Heijden,  
volgens besluit van het College voor Promoties  
te verdedigen op dinsdag 25 oktober 2011  
klokke 15:00

door

**Daniël Groen**  
geboren te Den Haag  
in 1979

## **Promotiecommissie**

Promotor: Prof. Dr. J.A. Bouwstra

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Prof. Dr. W.J. Briels  
Prof. Dr. M.J. Lawrence  
Prof. Dr. J.P. Abrahams

## Stellingen

Behorende bij het proefschrift

Stratum corneum model membranes:  
molecular organization in relation to skin barrier function

1. The barrier function of the skin is fundamental to life on dry land. (*D. Attenborough, Life on Earth, Little, Brown and Company, Boston, 1980*)
2. Understanding the permeability barrier function of the skin is important for rational design of transdermal drug delivery systems as well as for our understanding the etiology, and possible treatment, of a range of skin diseases in which barrier function is compromised. (*J.R. Hill and P.W. Wertz, BBA 1616, 2003, p121-126*)
3. The stratum corneum substitute, prepared with synthetic lipids only, closely mimics the stratum corneum lipid organization and can replace human stratum corneum in permeability studies. (*This thesis*)
4. Because of its adjustable lipid composition, the stratum corneum substitute is a suitable model to mimic the lipid organization in stratum corneum of diseased skin. (*This thesis*)
5. Whether an orthorhombic or hexagonal lipid packing is present in stratum corneum, is of less importance for a proper barrier function than the presence of a proper lamellar organization. (*This thesis*)
6. The presence of water is not required to form a proper lipid organization in a lipid model, mimicking that in human stratum corneum.
7. Many papers in the scientific literature on percutaneous absorption represent a complex blend of physicochemical theory and physiological practicalities. (*Brian W. Barry, Dermatological Formulations: Percutaneous Absorption, Marcel Dekker inc, New York, 1983*)
8. If you wish to make an apple pie from scratch, you must first invent the universe. (*Carl Sagan, Cosmos, 1980, p. 218.*)
9. The propositions in a thesis are a rudimentary organ that lost its function many years ago.



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