

## Supplementary Materials:

### Methods:

#### *Barrier Function Measurement*

A NOVA 9003 Dermal Phase Meter (NOVA DPM 9003, NOVA Technology, Portsmouth, NH) was used to measure surface electrical impedance (SEI) on skin substitute tissues. Pilot studies were conducted to determine the parameters of acceptable barrier function. From these studies, two criteria were set forth for the assessment of barrier function; the initial reading must be less than 294 dermal phase meter units (DPM) and the change in DPM over the 10-second test must be less than 658 DPM. Tissues were allowed to air-dry for 45 minutes while the dermal surface received hydration on a moistened cotton pad. The dermal meter probe was then held in constant contact with the epidermal surface of the tissue for the entire 10 second period. Intact human forearm skin was used as a control. Two measurements of SEI were taken every second by the meter. The mean values of readings from quadruplicate tissues are displayed for the entire measurement period. Error bars represent standard deviation.

## **Supplementary Materials:**

**Supplemental Figure 1: Tissues created with NIKS<sup>hBD-3</sup> keratinocytes exhibit barrier function similar to unmodified NIKS cells.** Barrier function was quantified over a 10 second period. Bars represent +/- SD (n=4 tissues each for NIKS and NIKS<sup>hBD-3</sup>). p=0.449 calculated using regression analysis comparing the two samples over 10 seconds.