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# EpiDermFT | Data Sheet

## Features

- Normal Human Cell Based Tissue
- 3-Dimensional, Highly Differentiated
- Normal Human Skin Structure
- Epidermis & Dermis
- Well Developed Basement Membrane
- Serum-Free Medium System
- Highly Reproducible
- Easily Handled Cell Culture Inserts
- *In Vivo*-Like Lipid Profile
- Quantifiable, Objective Endpoints
- Cost Effective Alternative to Animal and Clinical Testing
- Ideal for Anti-aging, Skin Hydration, Photo-protection and Wound Healing Studies

## The EpiDermFT Model

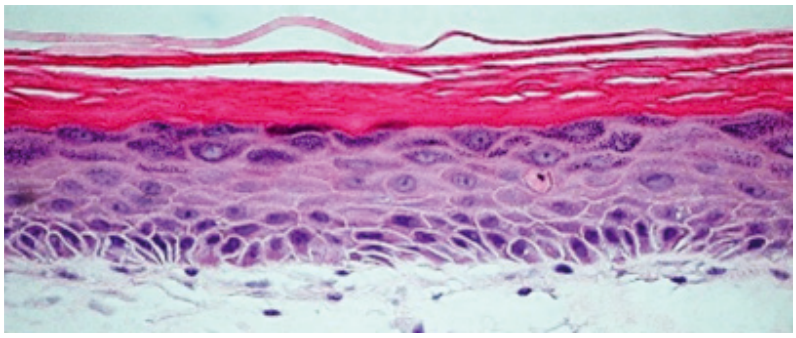
To enable *in vitro* study of dermal phenomena in which fibroblast-keratinocyte cell interactions are important, Mattek has developed EpiDermFT, a full thickness skin model. Mattek's EpiDermFT System consists of normal, human-derived epidermal keratinocytes (NHEK) and normal, human-derived dermal Fibroblasts (NHFB) which have been cultured to form a multilayered, highly differentiated model of the human dermis and epidermis. The NHEK and NHFB, which are cultured on specially prepared cell culture inserts using serum free medium, attain levels of differentiation on the cutting edge of *in vitro* skin technology. Ultrastructurally, the EpiDermFT Skin Model closely parallels human skin, thus providing a useful *in vitro* means to assess dermal irritancy and toxicology.

The EpiDermFT Full Thickness Skin Model exhibits *in vivo*-like morphological and growth characteristics which are uniform and highly reproducible. EpiDermFT consists of organized basal, spinous, granular, and cornified epidermal layers analogous to those found *in vivo*.

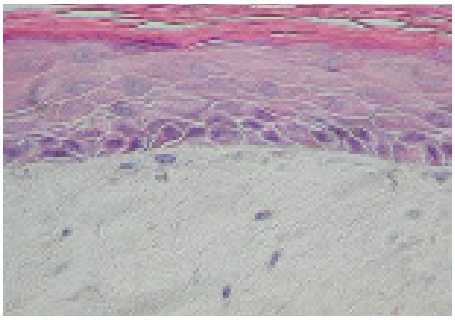
The dermal compartment is composed of a collagen matrix containing viable normal human dermal fibroblasts (NHDF). EpiDermFT is mitotically and metabolically active. Markers of mature epidermis-specific differentiation such as pro-filaggrin, the K1/K10 cytokeratin pair, involucrin, and type I epidermal transglutaminase have been localized in the model. Ultrastructural analysis has revealed the presence of keratohyalin granules, tonofilament bundles, desmosomes, and a multi-layered stratum corneum containing intercellular lamellar lipid layers arranged in patterns characteristic of *in vivo* epidermis. A well-developed basement membrane is present at the dermal/epidermal junction. Hemidesmosomes, lamina lucida, lamina densa and anchoring fibril structures are evident by transmission electron microscopy. Immunohistochemical analysis shows the presence of basement membrane structural and signaling proteins including collagen IV, Laminin, collagen VII and integrin α6.

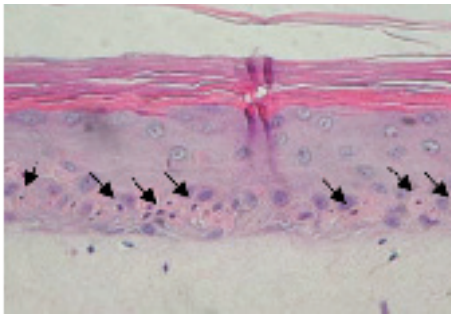
EpiDermFT is most commonly used for Anti-aging, Collagen Synthesis, Would Healing, and Photo-protection studies. Clear and straightforward protocols utilize modern-day techniques to study gene and protein expression, cytokine release, histological changes, and other skin-specific markers. The EpiDermFT tissues are produced utilizing Good Manufacturing Practice (GMP) procedures making them highly reproducible.

## Histology of EpiDermFT

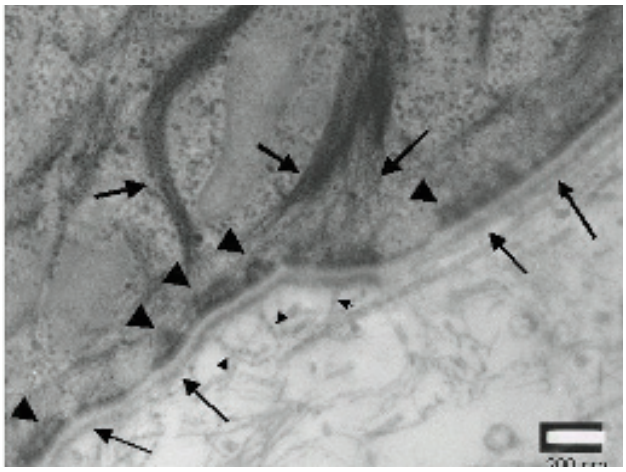


H&E Stained paraffin section reveals epidermis containing basal, spinous, granular keratinocytes and stratum corneum. Dermis contains numerous viable fibroblasts (400X).





Sunburn cell formation in EpiDermFT 400 following solar UV irradiation. H&E stained paraffin sections were prepared from EpiDermFT 400 24 hours after irradiation. Sunburn cells are indicated by arrows.



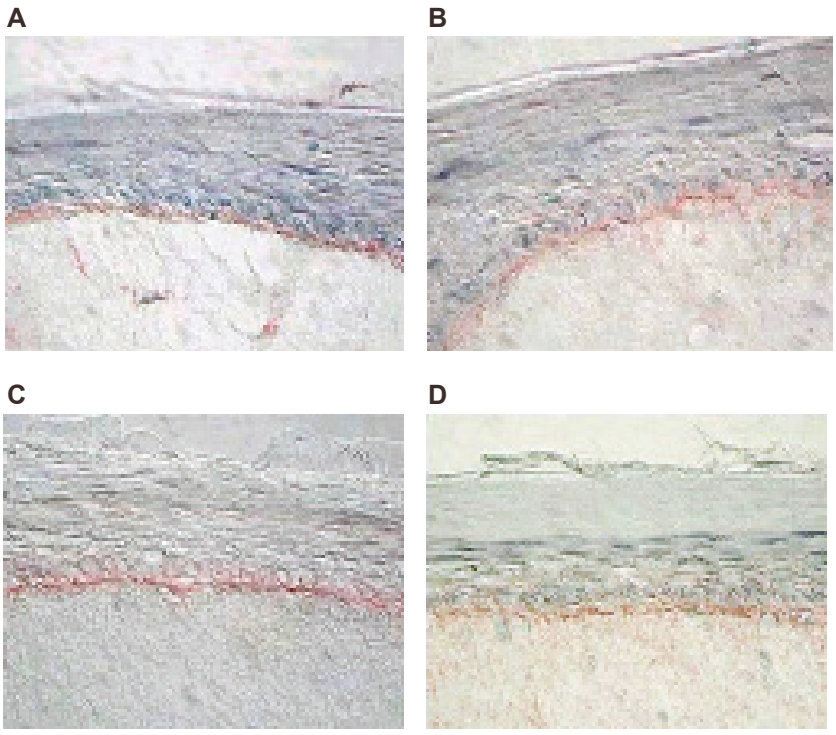
Lamina Densa →

Hemidesmosome ▶

Anchoring Fibril →

Tonofilament →

Transmission Electron Microscopy (TEM) of EpiDermFT 400 Basement Membrane zone. Higher magnification TEM shows finer detail of basement membrane structure: Note the anchoring fibrils beneath the lamina densa and tonofilament association with hemidesmosomes.




Immunohistochemical analysis of basement membrane structural proteins in EpiDermFT 400. Frozen sections of EpiDermFT 400 were immunostained for:
**A)** Collagen Type IV (component of lamina densa);
**B)** Laminin 5 (component of lamina lucida);
**C)** Collagen Type VII (component of anchoring fibril);
**D)** Integrin a-6 (component of hemidesmosome). Specific staining of the indicated protein is displayed as a red band at the dermal / epidermal junction.

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