



CASE STUDY

Advancing Skin Models for Inflammation and Wound Healing

Improving model stability and extending
tissue viability to enable more predictive
evaluation

The Challenge

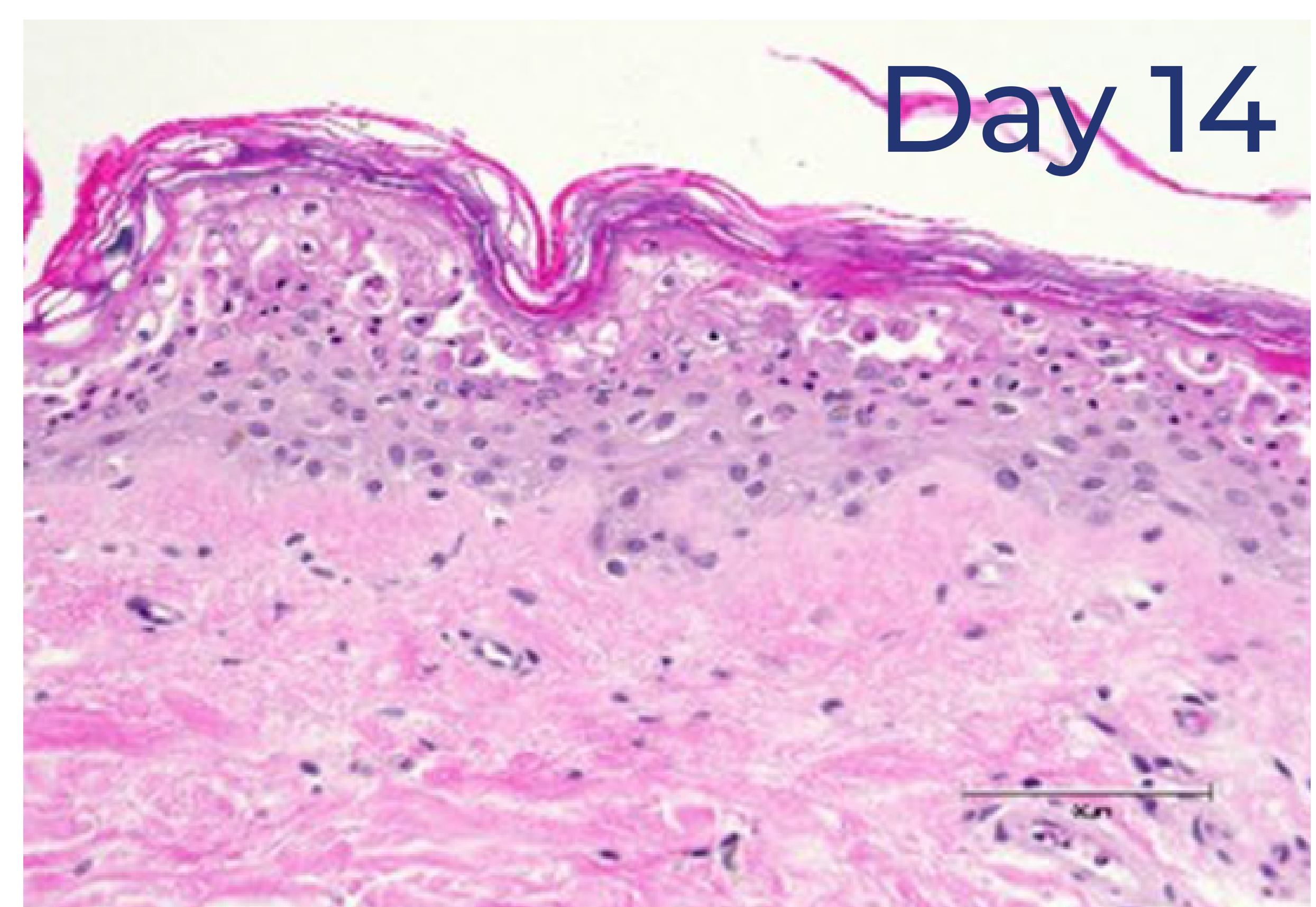
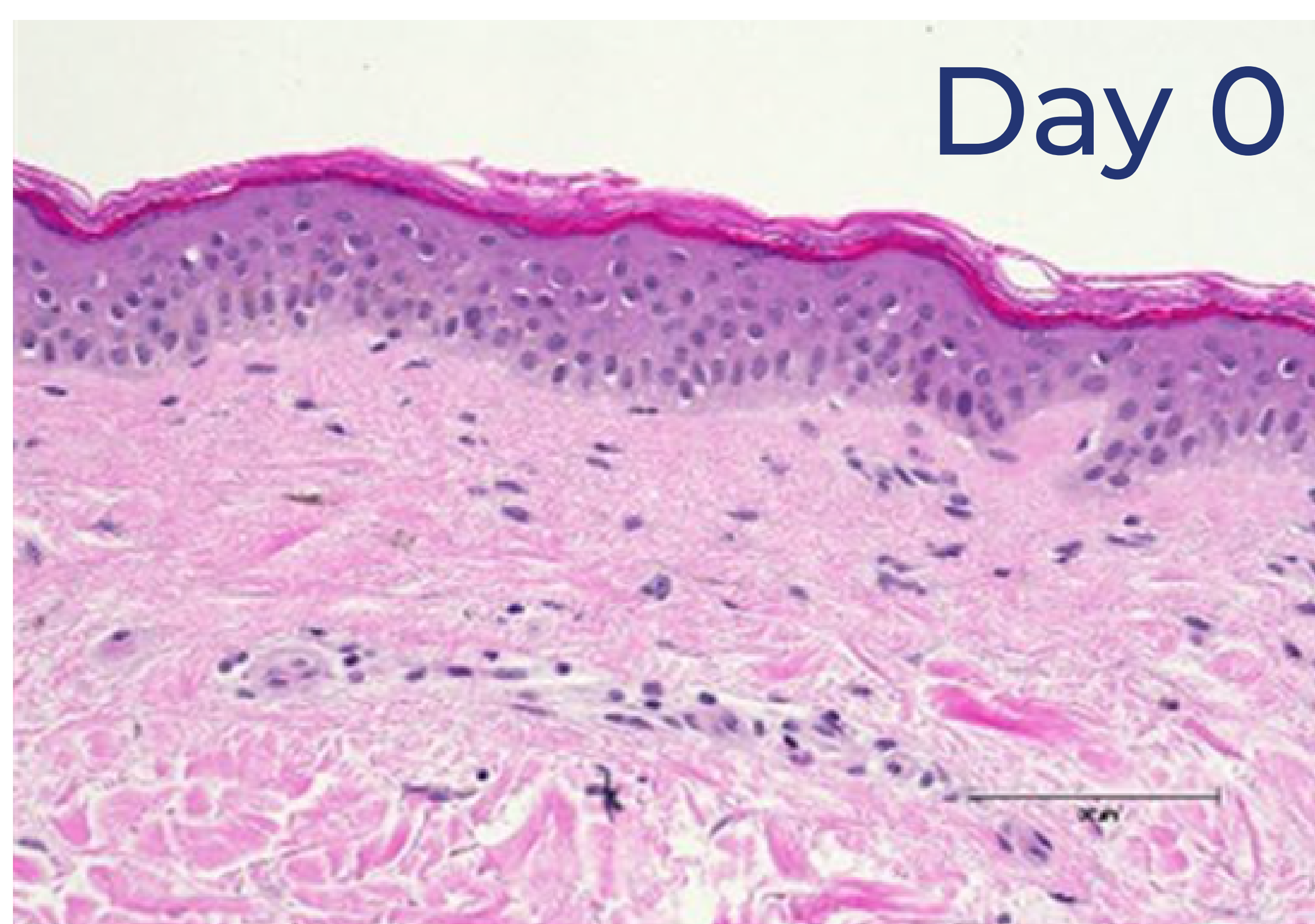
Skin is a complex immune organ that requires models capable of capturing both barrier function and immune response. Traditional in vitro approaches often lack physiological relevance, limiting their ability to accurately assess inflammation and tissue response.

Ex vivo skin models also degrade rapidly in culture, leading to reduced tissue integrity and biological activity over time. This restricts study duration and limits the ability to generate meaningful, predictive data.

Approach

MedPharm developed and optimized skin explant models to improve physiological relevance and extend viability:

- Utilized intact human skin explants to preserve barrier structure and immune components
- Maintained tissue architecture to better reflect in vivo conditions
- Optimized culture conditions, including pH, nutrients, and humidity
- Incorporated regenerative support elements such as growth factors and vitamins
- Extended tissue viability beyond standard model limitations
- Simulated disease-relevant inflammatory conditions
- Enabled evaluation of inflammatory response and drug activity
- Supported assessment of key biological pathways
- **Performed multi-endpoint analysis, including:**
 - Biomarkers of inflammation and remodeling
 - Gene expression and proliferation markers
 - Histological assessment over time
- Applied the model to wound healing studies to assess regeneration and treatment response



Outcome

- Extended viability of skin explants in culture
- Maintained tissue integrity and architecture over time
- Reduced degradation and improved model stability
- Enabled evaluation of inflammation and immune response
- Supported wound healing and regeneration studies
- Allowed longitudinal (multi-timepoint) analysis
- Generated more predictive and physiologically relevant data

Why This Matters

Traditional skin models often lack the complexity needed to predict real biological response. By extending tissue viability and preserving physiological relevance, MedPharm enables more accurate evaluation of inflammation and wound healing, supporting better decision-making and reducing development risk.