# Human Skin Explant Assays

Drug Discovery Assays Using Full-Thickness, Living Human Skin

**biopta**
A REPROCELL BRAND



## Alleviating the Skin Disease Burden

Skin disease is one of the leading causes of global disease burden, affecting millions of people world-wide. Common examples include psoriasis, atopic dermatitis (AD), infection, and skin cancers. To reduce the incidence of skin disease globally, determining the cause of disease and developing

At REPROCELL (Biopta), our human skin explant assays allow you to predict the safety, efficacy, and absorption of your test articles before clinical trial. Our experts have the knowledge and experience to provide human data at the preclincial stage, helping to increase your chances of clinical success.

## Living Human Skin

By choosing to model your drug in human fresh skin you can:

✓ **Add** commercial value and reduce risk of clinical failure

✓ **Improve** efficacy and safety data generated in target species

✓ **Access** experimental data that allows you to directly compare animal and human data

✓ **Work** with the world-leading GLP-compliant laboratory for testing in fresh, functional human tissues

## Healthy and Diseased Biopsies from Real Patients

| Fresh, healthy tissue | Tissue affected by skin disease |
| --- | --- |
| • Sourced from operations, such as cosmetic procedures or limb amputations | • Patients affected by psoriasis and AD are recruited into clinical sites and donate up to three biopsies |
| • Available from breast, abdomen, or lower leg with good availability | • Data from these tissues, in complement with healthy tissue, provide translational models to answer drug discovery questions |
| • Large samples available | |
| • Biopsies can be cultured in media for up to 7 days, for comparison | • Assessment of anti-inflammatory activity for tissue biological investigation and compound testing |

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# Four Human Diseased Skin Assays

While we can access living skin samples from patients living with specific skin disorders, we can also re-create common disease phenotypes in healthy skin. Our dedicated R&D team achieve this by exposing healthy skin tissue to disease-causing agents designed to activate specific disease relevant pathways. Below we have described the inflammatory profile of our REPROCELL (Biopta) skin assays.

## 1. T-Cell Model

If you wish to explore T-cell driven inflammatory diseases, our Phytohemagglutinin (PHA) stimulated model activates T-cells, resulting in increased release of IL-6, IL-10, IL-13 TNFα and GM-CSF.
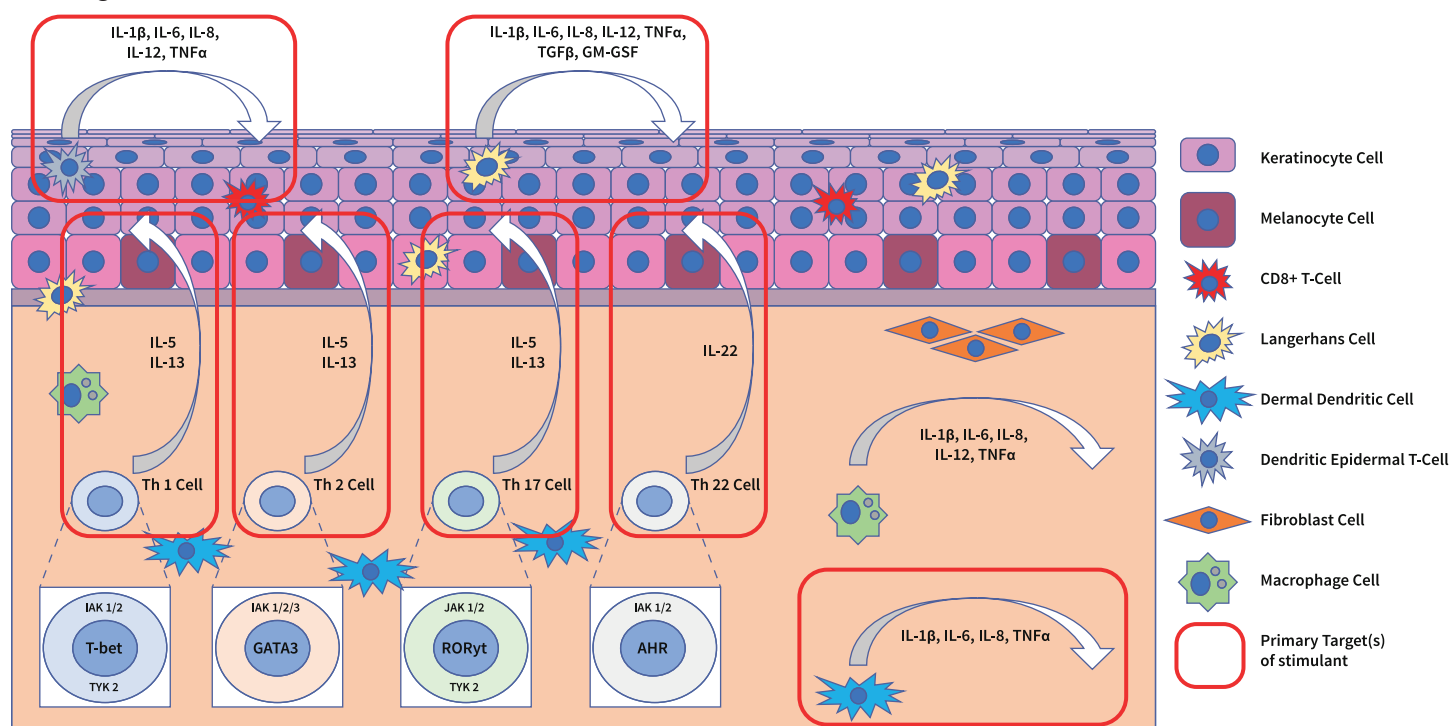


## 2. Acne Model

If your disease interests are specific to acne, we can mimic this disease phenotype in our Lipopolysaccharide (LPA) stimulated model. This assay displays increased levels of IL-β, IL-6, IL-8, and IL-10, creating an acne-like phenotype to test your articles.
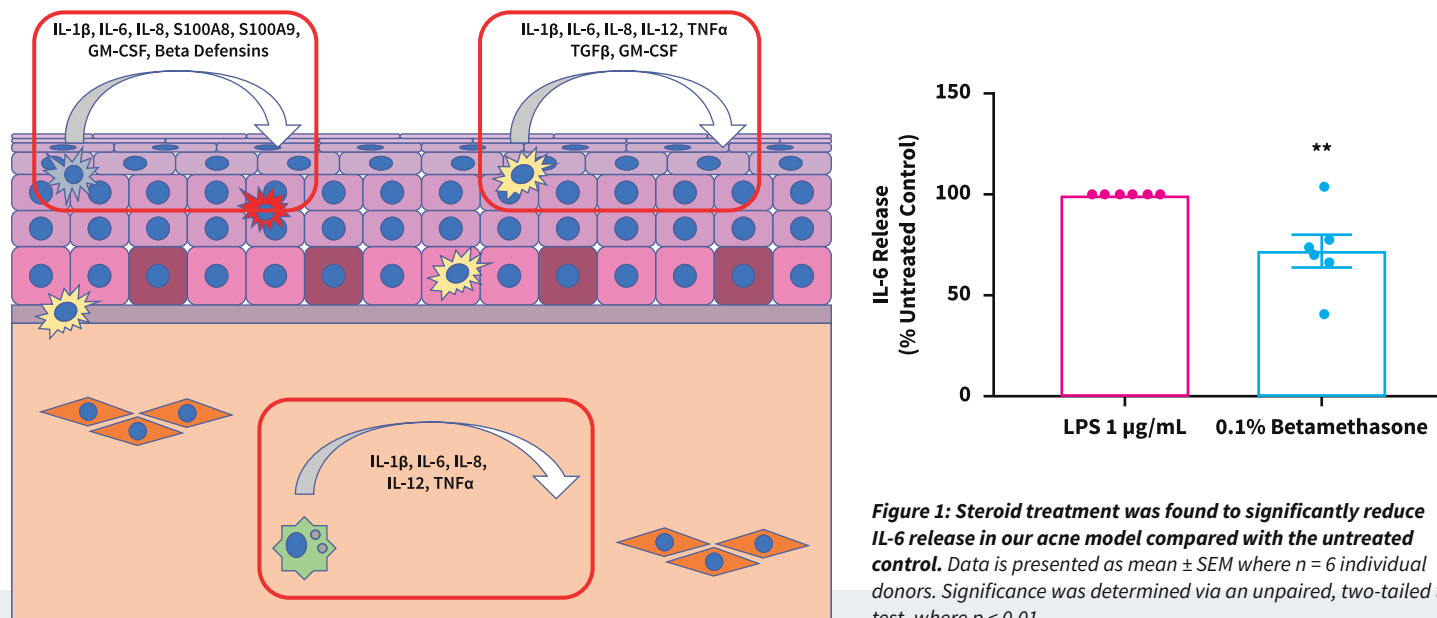




*Figure 1: Steroid treatment was found to significantly reduce IL-6 release in our acne model compared with the untreated control. Data is presented as mean ± SEM where n = 6 individual donors. Significance was determined via an unpaired, two-tailed t-test, where $p < 0.01$.*

# 3. Atopic Dermatitis Model

Our AD model is created using a test cocktail that stimulates IL- 5, IL-13, and IL-22 production. This cytokine profile mimics the inflammatory response observed in AD. It responds appropriately to steroid treatment, as demonstrated in the graph below, meaning we can use these compounds as a positive control for your test articles.
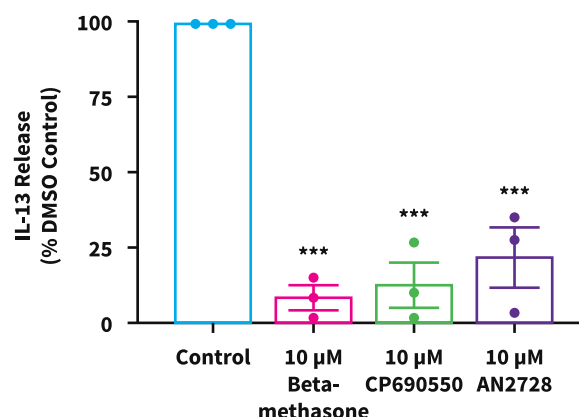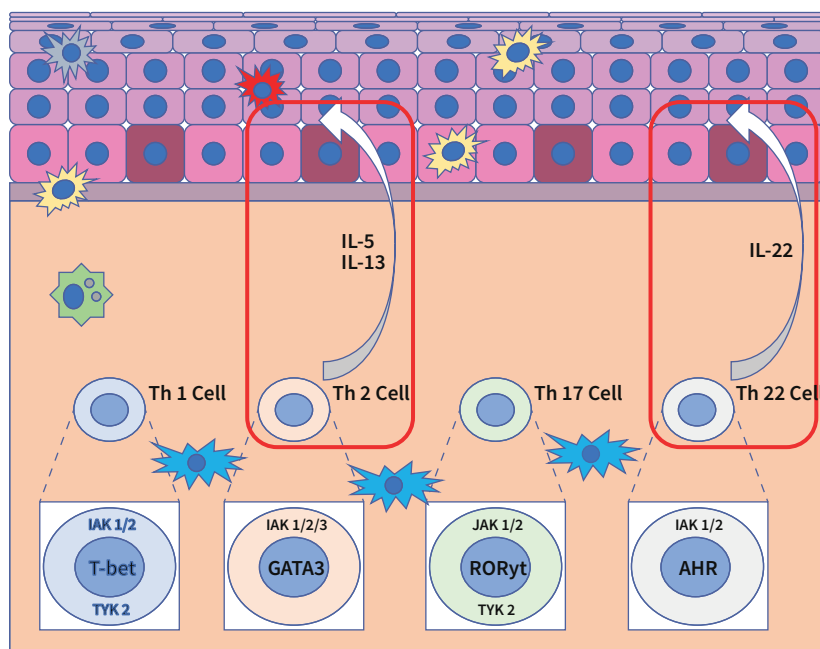




*Figure 2: Both test articles (TA) reduce IL-13 production significantly compared with the negative DMSO control.*
*Data is presented as mean ± SEM where n = 3. Significance was calculated via a two way ANOVA, where p < 0.001.*

# 4. Psoriasis Model

To mimic a psoriasis phenotype in healthy human skin explants, we use a test cocktail that activates the Th17/ IL-17 pathway. Following incubation of your test article with this model, changes in this cytokine profile are measured to determine drug efficacy and safety.
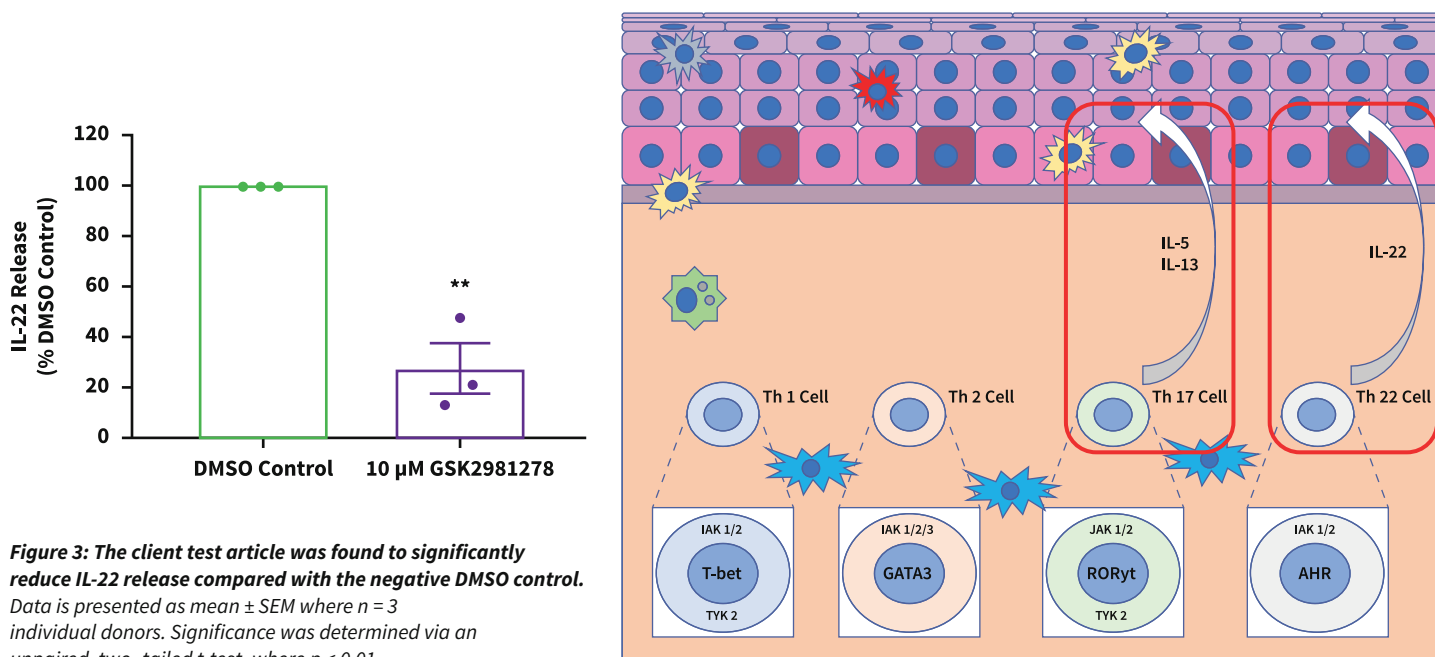


*Figure 3: The client test article was found to significantly reduce IL-22 release compared with the negative DMSO control.*
*Data is presented as mean ± SEM where n = 3 individual donors. Significance was determined via an unpaired, two- tailed t-test, where p < 0.01.*

# Human Skin Explant Assay Methodology



Well plate

Test sample
Well
Transwell filter
Epidermis
Dermis
Culture media
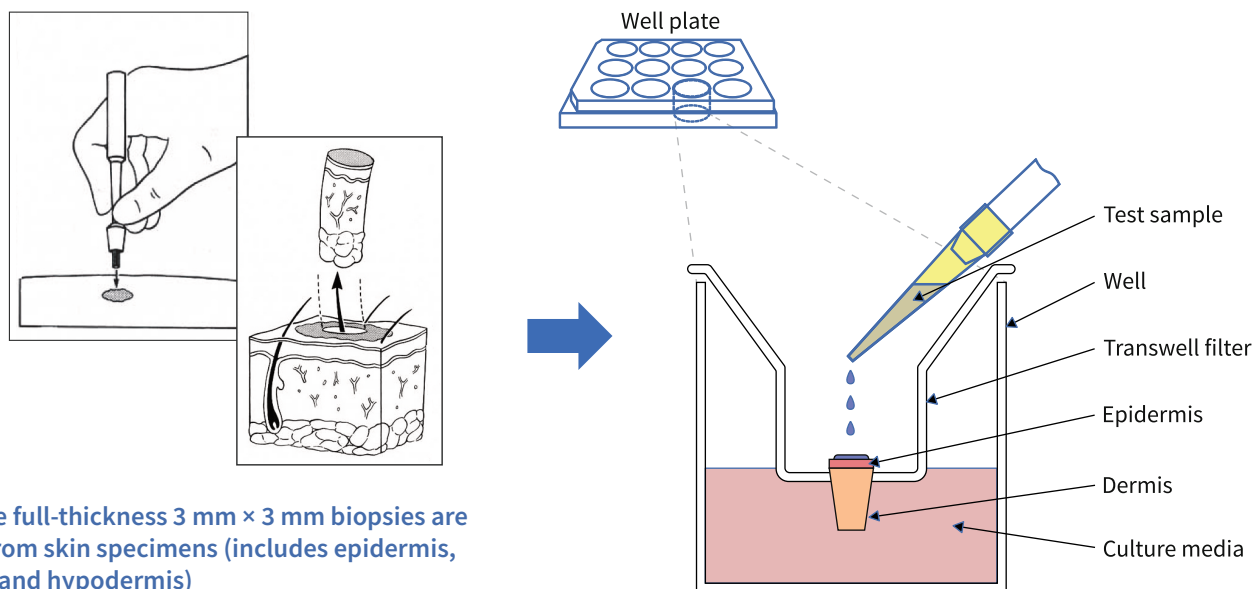
**Multiple full-thickness 3 mm × 3 mm biopsies are taken from skin specimens (includes epidermis, dermis and hypodermis)**

| **Day 0** |
|---|
| Test compounds are added to sample. The media is changed. This rest period reduces the impact of the biopsy process stimulating cytokine release. |

| **Day 1** |
|---|
| Test compounds as well as the differentiating test cocktail are added. The media is changed again. |

| **Day 2** |
|---|
| Media is collected for phenotype analysis by ELISA. Biopsy set is collected for rtPCR. |

## Customized Service you can Trust

Our global procurement network means both healthy and diseased tissue can be sourced and donated from various surgical interventions. Your test article will be assessed in accordance with your agreed experimental plan and the data analyzed concurrent to your requirements.

Once testing is complete, you will be presented with a final report prepared and reviewed by our team of experts. We will summarize all data and associated interpretations with you, taking as much time as you need so you can have confidence in your results heading into clinical trial.

**Living human skin arrives at our laboratory** → **Our skilled R&D team create punch biopsies from these tissues** → **These fresh tissue biopsies can be used to assess your test articles**

https://www.reprocell.com/drug-efficacy-safety-adme/human-tissue-assays/skin-disease