



## Your Source for Skin-derived Model Systems and Services

Consumers today can choose from a wide range of topical agents that can be applied to the skin for various purposes including anti-aging, skin hydration, wound healing, skin infection and inflammation, UV protection and cosmetic improvements.

The advent of complex personal care products requires relevant systems to understand the disposition and effect of the topical applications on normal and disease-affected skin. BioIVT is a leader in providing *in vitro* assay services and tissue-derived models for toxicity, skin disease and other personal care R&D research.

## Skin-derived Matrices for Safety, Toxicity and Efficacy Testing

### Skin Tissue

- Adipose aspirate
- Full thickness
- Matched set (skin tissue, blood & adipose tissue)

### Diseased Skin Punch Biopsies

- Acne
- Atopic dermatitis
- Psoriasis
- Vitiligo
- Normal

### Cellular

#### Primary Cells

- Adipocytes
- Fibroblasts
- Keratinocytes
- Melanocytes

#### Subcellular

- Microsomes, S9 & Cytosol
- Skin homogenate

### Human & Animal Species

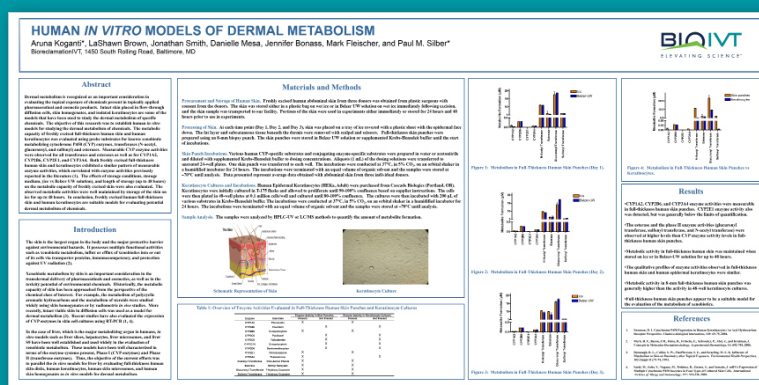
- Bovine
- Canine
- Pig/Mini-pig
- Rodent (mouse/rat)
- Sheep
- Human

## Custom Processing

- Dermatomed skin (100-800  $\mu$ m)
- Dissected hair follicles
- FFPE blocks/slides
- Separation of skin layers (epidermis, dermis, hypodermis)
- Skin discs prepped for permeability & absorption studies (2-10 mm diameter)
- RNA/DNA extraction

## Products in Action!

Check out our posters at [BioIVT.com](http://BioIVT.com)



**HUMAN IN VITRO MODELS OF DERMAL METABOLISM**  
Aruna Koganti<sup>1</sup>, LaShawn Brown, Jonathan Smith, Danielle Mesa, Jennifer Bonass, Mark Fleischer, and Paul M. Silber<sup>2</sup>  
<sup>1</sup>Bioevaluation/VT, 1450 South Ruffing Road, Baltimore, MD

**Abstract**  
Human metabolism is complex and a major determinant of drug response. The use of human skin models in drug development is essential for understanding the disposition and effect of topical applications on normal and disease-affected skin. BioIVT is a leader in providing *in vitro* assay services and tissue-derived models for toxicity, skin disease and other personal care R&D research.

**Introduction**  
The skin is the largest organ of the human body and is a major barrier to the entry of drugs and toxins. The skin is composed of three layers: the epidermis, dermis, and hypodermis. The epidermis is the outermost layer and is composed of keratinocytes, fibroblasts, and melanocytes. The dermis is the middle layer and is composed of collagen, elastin, and fibroblasts. The hypodermis is the innermost layer and is composed of adipose tissue.

**Materials and Methods**  
Human skin was obtained from a local skin donor and was processed into skin discs. The skin discs were prepped for permeability and absorption studies. The skin discs were incubated with a test compound and the metabolites were analyzed using HPLC-MS/MS.

**Results**  
The results of the study show that the skin disc model is a suitable model for studying the metabolism of drugs. The metabolites were detected in the skin disc and the levels were similar to those found in human skin.

**References**  
1. Koganti A, et al. (2018) Human skin disc model for studying the metabolism of drugs. *Journal of Pharmaceutical Sciences*, 107(12), 2345-2355.

# Clinical Skin Specimens to Accelerate Discovery

Skin Type	Live Donor	Cadaver Donor
Abdominal	✓	✓
Back	✓	✓
Brachioplasty	✓	—
Breast lift	✓	—
Face lift	✓	—
Feet	✓	✓
Foreskin	✓	—
Palm	—	✓
Thigh	—	✓
Scalp	—	✓
Skin punches	✓	✓

Demographics	Skin Tissue & Punch Biopsies
Age, Race & Gender	✓
Serology*	✓
Medical History	✓
Social History	✓

\*Live Tissue Serology: HIV-1, HIV-2, HBV, HCV, CMV, RPR.  
 Cadaver Serology: HIV-1, HIV-2, HBV, HCV  
 For clinical skin punch biopsies, serology results are only available upon request for an added fee.

## A Trusted Provider for Dermal Research Solutions

We work with a variety of primary skin-derived cell types. Our expertise in cell culture allows us to produce high-quality, relevant data from even the most challenging cell models.

### Assay services included:

- Cell toxicity
- Mitochondrial dysfunction (ATP, MTT)
- Oxidative stress (ROS, RNS, Super Oxide)
- DNA damage (PARP assay)
- Customized gene expression studies ...and more !



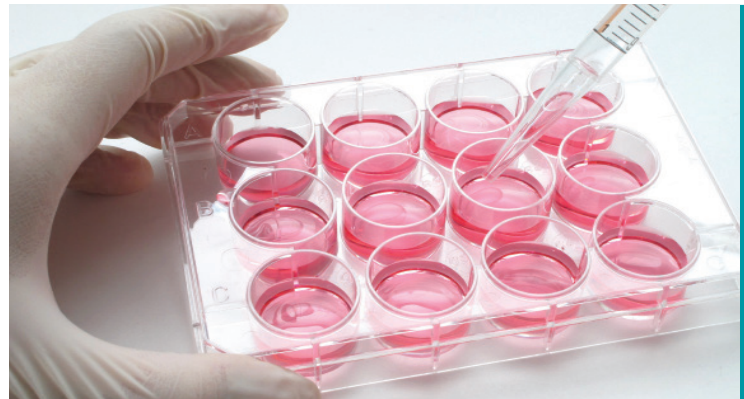
The importance of human skin as a model for *in vitro* testing for cosmetic and medical therapies has increased in recent years. BioreclamationIVT delivers diverse human skin products from a variety of patient populations. Based on your needs, tissue and its derivatives are sourced from either live donors or cadaveric donors. As always, we can create a custom collection program to suit your research requirements.

## ■ Diseased Skin Punch Biopsies

- Collected under IRB-approved protocols
- Up to four punches per donor
- Ability to collect lesion and non-lesion tissue samples from one individual
- Additional matrices can be collected including plasma, serum, PBMCs, etc.
- Multiple formats available: fresh, frozen, skin derivatives (e.g. DNA/RNA), FFPE & fixed specimens

## Don't See What You're Looking for?

Contact our customer service team with any product-related or custom request inquiries.



## Find out what others in the industry already know.

We accelerate your project by designing a cost-effective program to meet your research needs.

### For Inquiries:

North America & Asia Pacific  
 T +1 516 483 1196 F +1 516 483 4683 E customerservice@bioivt.com

Europe, Middle East & Africa  
 T +44 (0) 1444 250010 F +44 (0) 1444 250066 E cseurope@bioivt.com