EPISKIN

World leader in tissue engineering

FOR *IN VITRO* TESTING

APPLICATIONS

MODELS

APPLICATIONS	T-SKIN	SkinEthic RHE	SkinEthic RHE-LC	SkinEthic RHPE	SkinEthic HCE	SkinEthic HGE	SkinEthic HOE	SkinEthic HO2E	SkinEthic HVE
Skin irritation		●							
Skin corrosion		●	●						
UV exposure	●	●	●	●					
Bacterial adhesion	●	●	●		●	●	●	●	●
DNA Damage	●	●	●						
Omics	●	●	●	●	●	●	●	●	●
Permeability	●	●	●						
Eye irritation					●				
Medical Devices		●							
Microbiome		●							
Skin immune response			●	●					
Pigmentation/Depigmentation									
Oral & Gingival care						●	●		
Oesophageal Irritation								●	
Vaginal irritation									●

SUMMARY

EPISKIN: your reliable and trustworthy partner for your benefits

We innovate

since 1992 for a better science in producing advanced, relevant and robust in vitro 3D models allowing our users to predict human response. Very strict and unique quality controls help us to supply unmatched quality models. Our innovation, your science.

Innovation

Expertise

We dedicate

all our expertise, strengths and skills to be the world leader in tissue engineering for in vitro testing and research. No compromise. Our one and only core business is supplying advanced and relevant tissues to the scientific community and partnering with added value testing laboratories. Our commitment, your satisfaction.
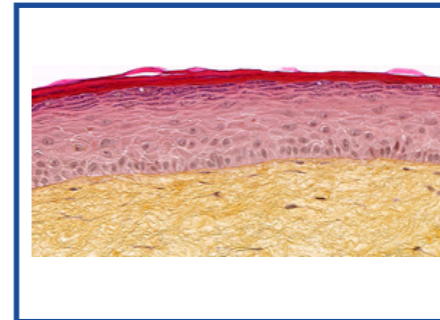
Worldwide

We deliver

worldwide, serving all customers with our 3 partners in India, Korea and Japan and with our 2 subsidiaries in Brazil and China and our headquarters in France. You order, we deliver.

ADVANCED 3D MODELS FOR A BETTER, MORE PREDICTIVE AND MORE ETHICAL SCIENCE

T-SKIN

Reconstructed Human
Full Thickness Model

NAME

**T-Skin™** / Reconstructed Human Full Thickness Skin Model

DESCRIPTION

T-Skin™ is an in vitro reconstructed skin which consists of a dermal equivalent with human fibroblasts overlaid by a stratified, well differentiated epidermis derived from normal human keratinocytes cultured on an inert polycarbonate filter.

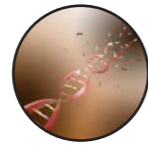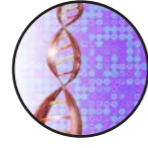This model exists at different stages of maturity.

Reconstructed Human
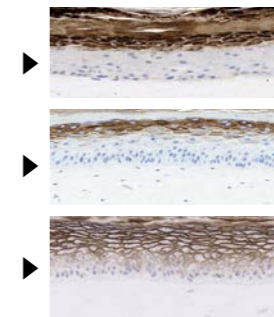## Full Thickness Model

FORMAT

6-well plate
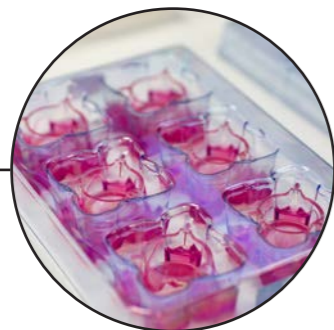
APPLICATIONS

UV Exposure / Phototoxicity / Photoprotection

DNA Damage

Bacterial adhesion

Omics

Permeability

SPECIFIC MARKERS
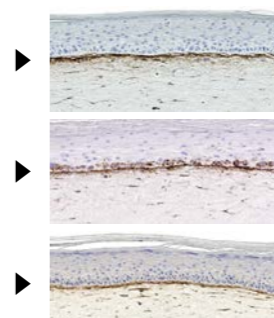
Differentiation markers:
- Filaggrin
  Involucrin
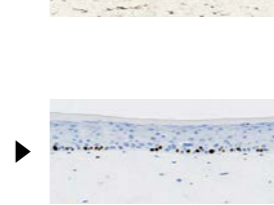 Loricrin
- Cytokeratin 10
- Transglutaminase-1

Dermal-Epidermal junction markers
- Collagen IV, VII, XII
- Laminin V
- Perlecan
  BP antigen

Proliferation markers
- Ki67

REFERENCES

Characterization of a New Reconstructed Full Thickness Skin Model, T-Skin™, and its Application for Investigations of Anti-Aging Compounds.
Bataillon M, Lelièvre D, Chapuis A, Thillou F, Autourde JB, Durand S, Boyera N, Rigaudeau AS, Besné I, Pellevoisin C. Int J Mol Sci. 2019 May 7;20(9):2240. doi: 10.3390/ijms20092240.

Characterization of a New Reconstructed Full Thickness Skin Model TSkin.
Autourde JB, Bataillon M, Besne I, Boyera N, Chapuis A, Durand S, Lelièvre D, Pellevoisin C, Rigaudeau AS, Thillou F. International Journal of Molecular Sciences.

Reconstructed skin to create in vitro flexible models of skin aging: new results and prospects.
Asselineau D, Ricois S, Pageon H, Zucchi H, Girardeau-Hubert S, Deneuville C, Haydont V, Neiveyans V, Lorthois I, In Farage MA, Miller W, Maibach H, editors. Springer Berlin Heidelberg Textbook of Aging Skin p 1203-1228.

In vitro and in vivo studies with tetrahydrojasmonic acid (LR2412) reveal its potential to correct signs of skin ageing.
Tran C, Michelet JF, Simonetti L, Fiat F, Garrigues A, Potter A, Segot E, Watson REB, Griffiths CEM, de Lacharrière O. JEADV, 28, 415-423.

RHE
SkinEthic

Reconstructed Human
Epidermis

NAME

SkinEthic™ RHE / Reconstructed Human Epidermis

DESCRIPTION

SkinEthic™ RHE is an *in vitro* reconstructed human epidermis from normal human keratinocytes cultured on an inert polycarbonate filter at the air-liquid interface. It is histologically similar to the *in vivo* human epidermis.

Our strong believe in Science and our continuous improvement with ISO 9001 certification push us to keep improving the production process of our model: From cell extraction to reconstruction with chemically defined biocomponents and **medium.**
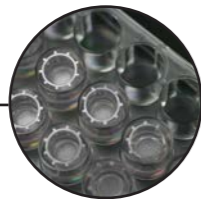
Every single biocomponent of each step of our production is clearly defined and their traceability is guaranteed. The process is then more secured, allowing to deliver a SkinEthic™ RHE model more reproducible, robust and reliable than ever.

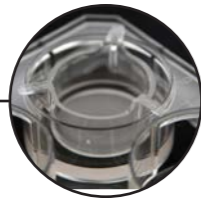Different maturities and surfaces are available.
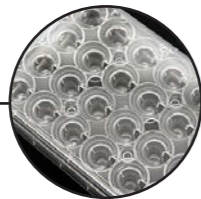
Reconstructed Human
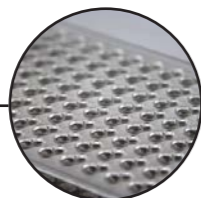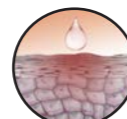## Epidermis

FORMAT

0.5 cm²

4 cm²
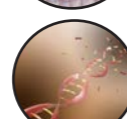
HTS 24-well plate
0.33 cm²

HTS 96-well plate
0.11 cm²

APPLICATIONS

- Skin irritation
- Skin corrosion
- UV Exposure / Phototoxicity / Photoprotection
- DNA Damage
- Bacterial adhesion
- Omics
- Permeability
- Medical Device

SPECIFIC MARKERS

Differentiation markers:
- ▶ Filaggrin
- ▶ Involucrin
- Loricrin
- ▶ Transglutaminase-1
- Keratin 10
- Keratin 5
- CD44

Presence of different epidermal classes of lipids comprising ceramides

Dermal-Epidermal junction markers
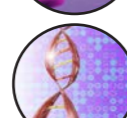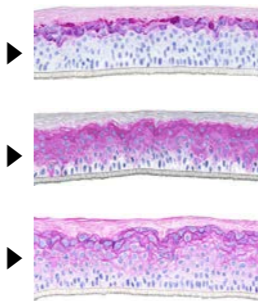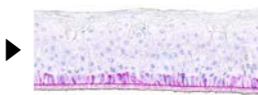- Type IV collagen
- ▶ Laminin V
- Alpha6Beta4-integrin
- BP antigen

Proliferation markers
- Ki67

Cell Migration Model

CMM
SkinEthic

are epidermal models on an innovative insert. Epidermal or mucosal reconstructed on this insert are histologically similar to *in vivo* human epidermis and mucosa.

REFERENCES

Pre-validation of SENS-IS assay for in vitro skin sensitization of medical devices.
Pellevoisin C, Cottrez F, Johansson J, Pedersen E, Coleman K, Groux H. Toxicology In Vitro (in review)

SkinEthic™ RHE for in vitro evaluation of skin irritation of medical device extracts.
Pellevoisin C, Videau C, Briotet D, Grégoire C, Tornier C, Alonso A, Rigaudeau AS, Bouez C, Seyler N. Toxicol In Vitro. 2018 Aug;50:418-425. Doi: 10.1016/j.tiv.2018.01.008. Epub.

In vitro patch test using non-invasive endpoints.
*De Brugerolle de Fraissinette A, Rosdy M, Tornier C. SOT.*

A catch-up validation study on reconstructed human epidermis (SkinEthic RHE) for full replacement of the Draize skin irritation test.
Alépée N, Tornier C, Robert C, Amsellem C, Roux MH, Doucet O, Pachot J, Méloni M, de Brugerolle de Fraissinette A. Toxicol In Vitro. 2010. Feb;24(1):257-66. doi: 10.1016/j.tiv.2009.08.024. Epub.

Malassezia colonisation on a reconstructed human epidermis: Imaging studies. *Pedrosa AF, Lisboa C, Branco J, Almeida AC, Mendes C, Pellevoisin C, Leite-Moreira A, Miranda IM, Rodrigues AG. Mycoses. 2019 Dec;62(12):1194-1201. doi: 10.1111/myc.13011. Epub.*

Preliminary performance data of the RHE/IL-18 assay performed on SkinEthic(™) RHE for the identification of contact sensitizers.
Andres E, Barry M, Hundt A, Dini C, Corsini E, Gibbs S, Roggen EL, Ferret PJ. Int J Cosmet Sci. 2017 Apr;39(2):121-132. doi: 10.1111/ics.12355. Epub.

RHE-LC
SkinEthic

Reconstructed Human Epidermis with
Langerhans Cells
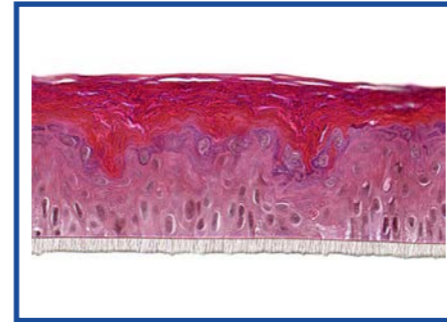
NAME

**SkinEthic™ RHE-LC** / Human Epidermal Model Langerhans Cells

DESCRIPTION

The SkinEthic™ RHE-LC model is a standard epidermal model in which Langerhans cells progenitors have been integrated. During the tissue reconstruction, these immature cells have differentiated into antigen-presenting Langerhans cells expressing the specific marker CD207 (langerin). They are mostly located and evenly spread within the supra-basal epidermal layer.
This model is therefore expected to be a useful tool for skin immune response studies.
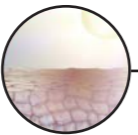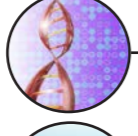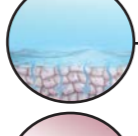
Reconstructed Human Epidermis
with **Langerhans Cells**

FORMAT

0.5 cm²
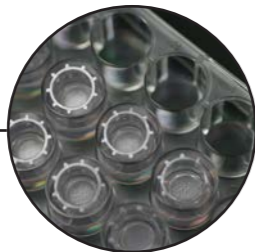
APPLICATIONS

UV Exposure / Phototoxicity / Photoprotection

Bacterial adhesion

Omics

Permeability

Skin immune response

SPECIFIC MARKERS

Langerhans cells markers:
▶ CD207 Langerin
▶ Birbeck granules
 CD1
 CD80
 CD86
 CCR7

Differentiation markers:
 Filaggrin
 Involucrin
 Loricrin
 Keratin 10
 Keratin 5

Presence of different epidermal classes of lipids comprising ceramides

Dermal-Epidermal junction markers
 Type IV collagen
▶ Laminin V
 Alpha6Beta4-integrin
 BP antigen

Proliferation markers
 Ki67

REFERENCES

Adding the immune component in reconstructed human skin and eye epithelia models.
Ancelin N, Benas D, Brusq JM, Douillard G, Ligouis M, Meloni M, Mondoulet L, Ovigne JM, Pellevoisin C, Rigaudeau AS, Sahuc F, Segaud V.
Poster Asiatox

Cellular mechanistic investigation on antigen delivery by Viaskin® patchfor epicutaneous immunotherapy with reconstructed human epidermis including Langerhans cells (SkinEthicTM RHE-LC).
Dheff V, Dioszeghy V, Ligouis M, Mondoulet L, Pellevoisin C, Sahuc F.
Poster
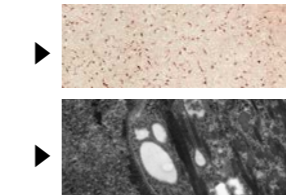
RHPE
SkinEthic

Reconstructed Human
Pigmented Epidermis

NAME

SkinEthic™ RHPE / Reconstructed Human Pigmented Epidermis

DESCRIPTION

The SkinEthic™ RHPE model is composed of normal human keratinocytes cultivated in the presence of melanocytes of phototype II, IV or VI, localized in the basal layer.

The different tanning degrees of these constructs correspond macroscopically to 3 different phototypes of human skin.

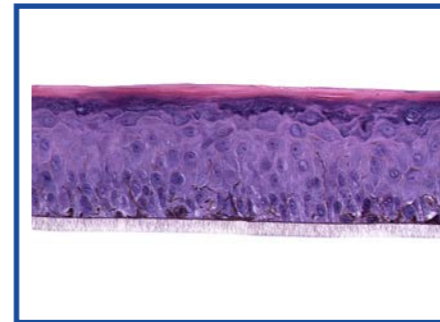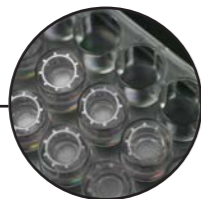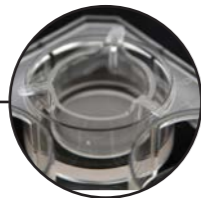## Reconstructed Human
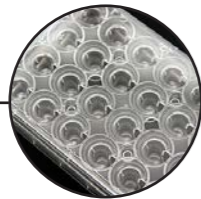## Pigmented Epidermis

FORMAT

0.5 cm²

4 cm²

HTS 24-well plate
0.33 cm²

HTS 96-well plate
0.11 cm²
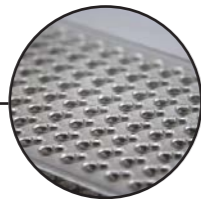
APPLICATIONS

Pigmentation

Depigmentation

UV Exposure / Phototoxicity / Photoprotection
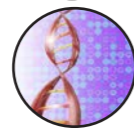
Omics

SPECIFIC MARKERS

Melanocytes localized in the basal cell layer interspersed with basal cell keratinocytes.

Melanin distribution in the basal layer

▶ Ki 67

REFERENCES

Skin lightening effect of natural extracts coming from Senegal botanical biodiversity.
Baillet-Guffroy A, El Khoury R, Lteif R, Michael-Jubeli R, Salameh D, Tfayli A, Zeitoun H.
International Journal of Dermatology.

Reconstructed Human Pigmented Epidermis (RHPE): an in vitro model for the evaluation of melanogenesis.
Sahuc F. SOFW Magazine.

Sepicalm VG, a new skin lightening enable to modulate melanogenesis-related genes and to prevent UV-induced pigmentation thanks to its soothing properties.
Dumont S, Khaiat A, Puginier M, Stoltz C, Garcia C.
SEPPIC

Melanocyte containing human organotypic epidermis as a model to evaluate toxicity of melanin binding substances.
Straube F, Junker U, Kretz S, Wolf A.
Society of Toxicology, USA.

HCE
SkinEthic

Human
Corneal Epithelium

NAME

SkinEthic™ HCE / Human Corneal Epithelium

DESCRIPTION

The SkinEthic™ HCE model is composed of transformed human corneal keratinocytes cultivated on an inert polycarbonate filter at the air liquid interface in a chemically defined medium.
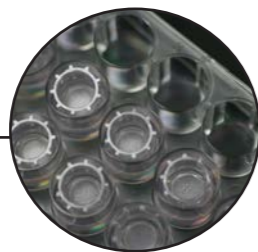
The reconstructed tissue forms a stratified and well organized epithelium which is structurally, morphologically and functionnally similar to the human cornea with presence of basal, wing and mucus production cells.
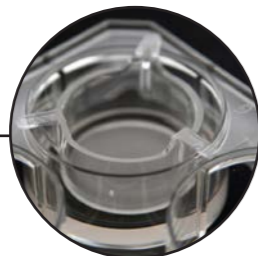
Human
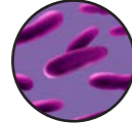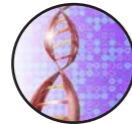## Corneal Epithelium

FORMAT

0.5 cm²

4 cm²

APPLICATIONS

Ocular Irritation

Bacterial Adhesion

Omics

▶ Eye Irritation Test (EIT) Method validated by EURL-ECVAM and under OECD TG 492 for identification of chemicals not requiring classification for eye hazard (UN GHS)

▶ EIT implemented in the draft OECD GD for serious damage and eye irritation

▶ Corneal differential display i.e. mucin production

SPECIFIC MARKERS

Differentiation markers:

▶   Keratin
▶   CD44
      Hemidesmosomes

REFERENCES

Eye Irritation Potential of Microglycine and Microglycine-Containing Ointments: An in vitro Study on Reconstructed Human Corneal Epithelium.
Balzaretti S, Barone S, Ceriotti L, Meloni M. Clinical Ophthalmology.

Multi-laboratory evaluation of SkinEthic HCE test method for testing serious eye damage/eye irritation using solid chemicals and overall performance of the test method with regard to solid and liquid chemicals testing.
*Alépée N, Adriaens E, Grandidier MH, Meloni M, Nardelli L, Vinall CJ, Toner F, Roper CS, Van Rompay AR, Leblanc V, Cotovio J.
Toxicology In Vitro 34, 55-70.*

In vitro assessment of eye irritancy using the Reconstructed Human Corneal Epithelial SkinEthic™ HCE model: Application to 435 substances from consumer products industry.
*Cotovio J et al.
Toxicology In Vitro, 24, 523-537.*

Are coffee silverskin extracts safe for topical use? An in vitro and in vivo approach.
*Alves RC, Beatriz M, Ferreira M, Helena Amaral M, Oliveira PP, Pereira C, Pimentel FB, Rodrigues F, Sarmento B.
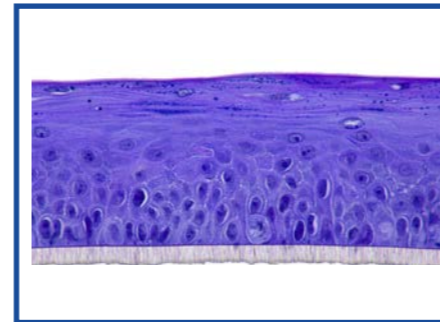Elsevier.*

Cell Migration Model

CMM
SkinEthic

are epidermal models on an innovative insert. Epidermal or mucosal reconstructed on this insert are histologically similar to *in vivo* human epidermis and mucosa.

HGE
SkinEthic

Human
Gingival Epithelium

NAME

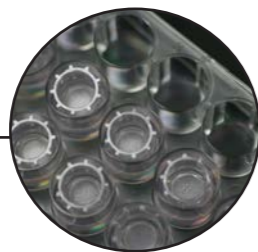SkinEthic™ **HGE** / Human Gingival Epithelium

DESCRIPTION

The SkinEthic™ HGE model is composed of normal human gingival cells cultivated on an inert polycarbonate filter at the air liquid interface in a chemically defined medium.

This model is histologically similar to the outer cell layers of the human gum.
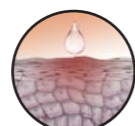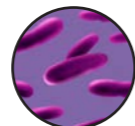
Human
Gingival Epithelium

FORMAT

0.5 cm²

APPLICATIONS

Oral Care

Bacterial Adhesion

Omics

SPECIFIC MARKERS

Differentiation markers:

▸ Filaggrin
▸ Keratin 13
   Ki67
   CK10
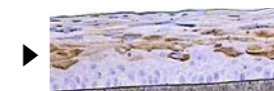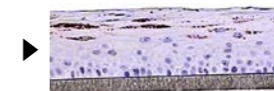
REFERENCES

Evaluation of an oral care product safety screening program utilizing the in vitro SkinEthic Human Gingival Epithelium (RHG) and Oral Buccal (RHO) models.
Wurzburger L, Kazmi P, Re T, Alonso A, Bertino B, Barnes N, de Brugerolle de Fraissinette A, Hilberer A, Raabe H, Wilt N, Srinivasan V. SOT.

In Vitro Toxicity evaluation of toothpastes using reconstructed human oral and gingival mucosa models.
Van de Vannet B, De Wever B, Bottenberg P, Cappadoro M.
Presented at the Society of Toxicology, New Orleans, USA.

Characterization of human oral and gingival mucosal models: a histological characterization and applications in toxicity testing.
Vande Vannet B and Hanssens JL, Free University of Brussels.
3rd International SkinEthic Workshop Nice, France.

HOE
SkinEthic

Human
Oral Epithelium

NAME

SkinEthic™ HOE / Human Oral Epithelium

DESCRIPTION

The SkinEthic™ HOE model is composed of TR146 cells (derived from a squamous cell carcinoma of the buccal mucosa) cultivated on an inert polycarbonate filter at the air liquid interface in a chemically defined medium.

This model forms an epithelial tissue devoid of stratum corneum, resembling histologically to the mucosa of the oral cavity.

Human
Oral Epithelium
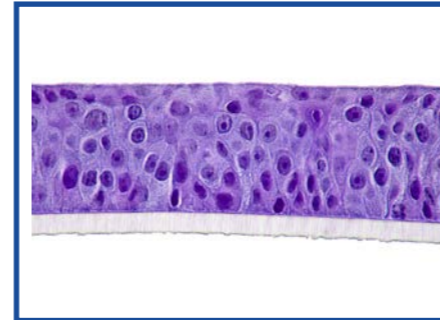
FORMAT
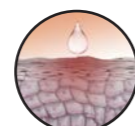
0.5 cm²

HTS 24-well plate
0.33 cm²

APPLICATIONS
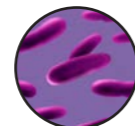
Oral Care

Bacterial Adhesion

Omics

SPECIFIC MARKERS

Differentiation markers:

Keratin 6
Keratin 16
▸ CD44
▸ Ki67
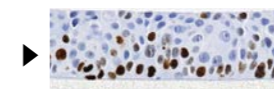
REFERENCES

Evaluation of an oral care product safety screening program utilizing the in vitro SkinEthic Human Gingival Epithelium (RHG) and Oral Buccal (RHO) models.
Wurzburger L, Kazmi P, Re T, Alonso A, Bertino B, Barnes N, de Brugerolle de Fraissinette A, Hilberer A, Raabe H, Wilt N, Srinivasan V. SOT.

A Biphasic Innate Immune MAPK Response Discriminates between the Yeast and Hyphal Forms of Candida albicans in Epithelial Cells.
Moyes DL et al. Cell Host & Microbe, 8, 225-235.

Quantitative expression of the Candida albicans secreted aspartyl proteinase gene family in human oral and vaginal candidiasis.
Naglik JR et al. Microbiology, 154, 3266-3280.

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HO2E
SkinEthic

Human
Oesophageal Epithelium

SkinEthic™ HO2E / Human Oesophageal Epithelium

DESCRIPTION

The SkinEthic™ H02E model is a human oesophageal epithelium composed of immortalized cell line Kyse 510, cultivated on an inert polycarbonate filter at the air liquid interface in a chemically defined medium.

This model forms an epithelial tissue devoid of stratum corneum, resembling histologically tothe outer cell layers of the human oesophagus.

Human
Oesophageal Epithelium

FORMAT

0.5 cm²

HTS 24-well plate
0.33 cm²

HTS 96-well plate
0.11 cm²

APPLICATIONS

Oesophageal Irritation

Bacterial Adhesion
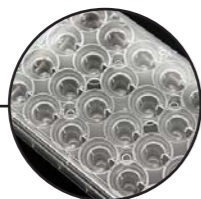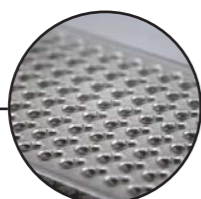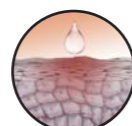
Omics

SPECIFIC MARKERS

Differentiation markers:

▶   Keratin 6
▶   Keratin 13
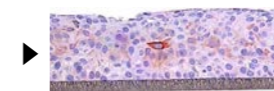
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HVE
SkinEthic

Human
Vaginal Epithelium

NAME
SkinEthic™ HVE / Human Vaginal Epithelium

DESCRIPTION
The SkinEthic™ HVE model is composed of A431 cells (derived from a vulval epidermoid carcinoma) cultivated on an inert polycarbonate filter at the air liquid interface in a chemically defined medium.

This model is histologically similar to the *in vivo* vaginal mucosa.

Human
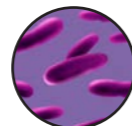## Vaginal Epithelium

FORMAT

0.5 cm²

HTS 24-well plate
0.33 cm²

APPLICATIONS

Vaginal Irritation

Bacterial Adhesion

Omics

SPECIFIC MARKERS

Differentiation markers:
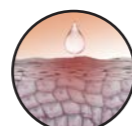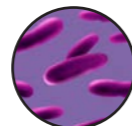
▶ Keratin
▶ Involucrin
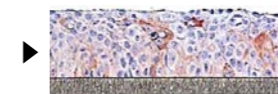
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SOT.

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Naglik JR et al.
Microbiology, 154, 3266-3280.

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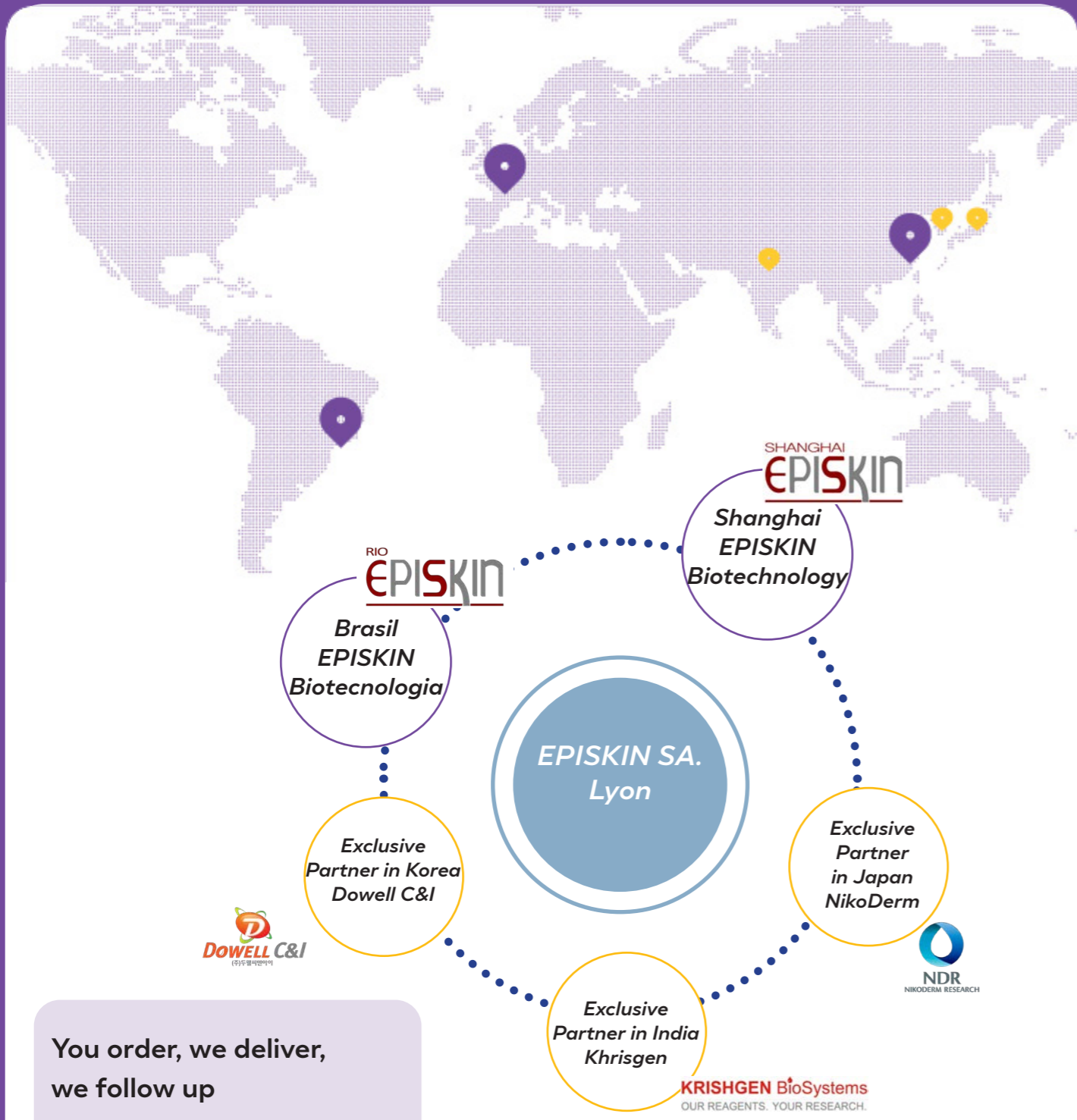
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EPISKIN
ACADEMY

We support our customers

We insure to users of 3D models the best support for implementing 3D's based standard protocols and assist them, for developing new applications of human reconstructed epithelium.

We raise awareness

We relay and illustrate EPISKIN and group's commitments to 3R. We train scientists, KOL, students and future stakeholders to the scientific and regulatory challenges of alternative to animal testing.

We promote scientific expertise

We promote scientific expertise and uses of 3D models by interacting and networking with scientific community.
We participate actively to congresses, workshops for sharing scientific results onto human 3D models and promote publication of new data generated by our worldwide customers.

Education

EPISKIN Academy created in 2011 is an international program dedicated to promotion and education to alternatives to animal testing methods in toxicology.

As a world leader in tissue engineering, we are committed to share our knowledge and expertise with scientific community to support implementation of in vitro validated methods and development of new methods using human reconstructed tissues. It is with this in mind that we offer training on validated methods and take part in numerous congresses to present the latest advances in these fields.
To go further, we are also engaged in several academic programs worldwide to raise awareness and to prepare the next generation of scientists and regulators for the challenges of 21st century toxicology.
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