



CUTECH Screening Services on Human Ex-vivo Models

(July 2019)

The list may not be exhaustive. For any special screening requirement, please contact us.

MODEL	APPLICATION	READ-OUT	LIST OF MARKERS/STAINING	ABBREVIATIONS	METHODOLOGY
SKIN	Viability	Viability	MTT test		C
		Morphology	Haematoxylin Eosin	H&E	HC
		Proliferation	Marker of proliferation KI-67	KI67	IHC
		Apoptosis	Tunel assay		IHC
	Pigmentation	Melanin	Fontana-Masson	FM	HC
		Tyrosinase	Tyrosinase	TYR	IHC
		Various Markers	Tyrosinase Related Protein 1	TYRP1	
			Melanogenesis Associated Transcription Factor	MITF	
	Aging	Total collagen	Picrosirius Red	PSR	HC
		Elastin	Elastica Van Gieson		HC
			Elastin	ELN	IHC
		Pro-collagen 1	Pro-Collagen I alpha 1	CO1A1	ELISA in medium
					qRT-PCR
					IHC
		MMP	Matrix Metallopeptidase 1	MMP1	qRT-PCR
					IHC
		Mitochondrial markers	Translocase Of Outer Mitochondrial Membrane 20	TOMM20	IHC
			Mitochondrial Dynamain Like GTPase	OPA1	
		Epidermis markers	Advanced glycation end products	AGE	IHC
			CD44 molecule	CD44	
			Heparin Binding EGF Like Growth Factor	HBEGF	
			Syndecan	SDC	
			Heat Shock Protein Family B (Small) Member 1	HSPB1	
		Dermal-epidermal junction markers	Crystallin Alpha B	CRYAB	IHC
			Collagen type 7	COL7A1	
			Collagen type 4	COL4A1	
Laminin Subunit alpha 5	LAMA5				
Heparan Sulfate Proteoglycan 2 (Perlecan)	HSPG2				
Tenascin C	TNC				



CUTECH Screening Services on Human Ex-vivo Models

(July 2019)

The list may not be exhaustive. For any special screening requirement, please contact us.

MODEL	APPLICATION	READ-OUT	LIST OF MARKERS/STAINING	ABBREVIATIONS	METHODOLOGY
SKIN	Aging	Dermis markers	Collagen type 1	COL1A1	IHC
			Collagen type 3	COL3A1	
			Fibrillin 1	FBN1	
			Fibronectin	FN1	
			Hyaluronan Binding Protein	HABP	
			Integrin Subunit Beta 1	ITGB1	
			Decorin	DCN	
			TIMP metalloproteinase inhibitor 1	TIMP1	
	Photoaging UVA UVB UVA/UVB Visible Light	CPD	Cyclobutane pyrimidine dimers	CPD	IHC
		p53	Tumor Protein P53	p53	IHC
		AGE	Advanced glycation end products	AGE	IHC
		Sun burn cells	Haematoxylin Eosin	H&E	HC
		ROS			DCFH-DA
		Lipid oxidation	4 Hydroxynonenal	4-HNE	IHC
		Protein oxidation (oxyblot)			WB
		Total Collagen	Picrosirius Red	PSR	HC
		Collagen III	Collagen type 3	COL3A1	IHC
		Elastin	Elastica Van Gieson		HC
			Elastin	ELN	IHC
		TIMP	TIMP metalloproteinase inhibitor 1	TIMP1	IHC
		MMP	Matrix Metalloproteinase 1	MMP1	qRT-PCR
	IHC				
	Oxidative Stress	CPD	Cyclobutane pyrimidine dimers	CPD	IHC
		ROS			DCFH-DA
		Lipid oxidation	4 Hydroxynonenal	4-HNE	IHC
		Protein oxidation (oxyblot)			WB
		AGE	Advanced glycation end products	AGE	IHC
Various markers		Catalase	CAT	qRT-PCR	
		Glutamate-Cysteine Ligase Catalytic Subunit	GCLC		
		Heme Oxygenase 1	HMOX1		
		NAD(P)H Quinone Dehydrogenase 1	NQO1		
PCR array for oxidative stress					



CUTECH Screening Services on Human Ex-vivo Models

(July 2019)

The list may not be exhaustive. For any special screening requirement, please contact us.

MODEL	APPLICATION	READ-OUT	LIST OF MARKERS/STAINING	ABBREVIATIONS	METHODOLOGY	
SKIN	Pollution	ROS			DCFH-DA	
		Protein oxidation (oxyblot)			WB	
		Barrier integrity	Rhodamine B		Rhodamine B	
		Interleukin 8	Interleukin 8	IL-8	ELISA in medium	
		Melanin	Fontana-Masson	FM	HC	
	Moisturization	Hyaluronic acid				ELISA in medium
		Acidic GAGs (Hyaluronic acid)	Alcian Blue	HA	HC	ELISA in tissue homogenates
		Various markers	Decorin	DCN	IHC	
			Heparan Sulfate Proteoglycan 2 (Perlecan)	HSPG2		
			Syndecan	SDC		
	Hyaluronan Binding Protein	HABP				
	Stratum Corneum Regeneration/ Skin barrier	Filaggrin	Filaggrin	FLG	IHC	
		Stratum corneum thickness	Haematoxylin Eosin	H&E	HC	
		Penetration assay	Rhodamine B		Rhodamine B	
		Various markers	Involucrin	IVL	IHC	
			Keratin 5	KRT5		
			Keratin 10	KRT10		
			Keratin 14	KRT14		
			Claudin 1	CLD1		
			Desmocollin 1	DSC1		
			Desmoglein 1	DSG1		
			Olfactory Receptor Family 2 Subfamily AT Member 4	OR2AT4		
			3-Hydroxy-3-Methylglutaryl-CoA Reductase	HMGCR		
Peptidase Inhibitor 3			Pi3	qRT-PCR		
S100 Calcium Binding Protein A7	S100A7	IHC				
Transglutaminase 1	TGM1	qRT-PCR				
UDP-Glucose Ceramide Glucosyltransferase	UGCG	WB	qRT-PCR			
		qRT-PCR				



CUTECH Screening Services on Human Ex-vivo Models

(July 2019)

The list may not be exhaustive. For any special screening requirement, please contact us.

MODEL	APPLICATION	READ-OUT	LIST OF MARKERS/STAINING	ABBREVIATIONS	METHODOLOGY	
SKIN	Epidermis Regeneration	Epidermal recovery	Keratin 14	KRT14	IHC	
		Morphology	Haematoxylin Eosin	H&E	HC	
		Various markers	Integrin Subunit Beta 1	ITGB1	IHC	
	Retinoid response	Various markers		Keratin 6	KRT6	qRT-PCR
				Aldehyde Dehydrogenase 1 Family Member A3	ALDH1A3	
				Heparin Binding EGF Like Growth Factor	HBEGF	
				Cellular Retinoic Acid Binding Protein 2	CRABP2	
	Inflammation SDS IL-1alpha UV	Interleukins		Interleukin 1 alpha	IL-1alpha	ELISA in medium
				Interleukin 6	IL-6	
				Interleukin 8	IL-8	
				Tumor Necrosis Factor alpha	TNFalpha	
		Prostaglandins	Prostaglandin E2	PGE2	ELISA in medium	
	PCR array for human inflammation			qRT-PCR		
	Irritation (e.g. induced by SDS)	Interleukins		Interleukin 1 alpha	IL-1alpha	ELISA in medium
				Interleukin 6	IL-6	
				Interleukin 8	IL-8	
				Tumor Necrosis Factor alpha	TNFalpha	
	Steroidogenesis	Various markers		Hydroxysteroid 11-Beta Dehydrogenase 1	HSD11B1	IHC
			Hydroxysteroid 17-Beta Dehydrogenase 1	HSD17B1		
			Hydroxysteroid 17-Beta Dehydrogenase 2	HSD17B2		
SUBCUTIS	Fat Management	Free glycerol release			C	
		Total Lipid quantification			Infrared Spectroscopy	
		Various markers	Leptin	LEP	qRT-PCR	
			Adiponectin	ADIPOQ	WB qRT-PCR	
HAIR	Viability	Viability	Resazurin assay		C	
		Morphology	Haematoxylin Eosin	H&E	HC	
	Hair Growth	Hair shaft elongation				Analysis at the stereomicroscope
		Cell proliferation/apoptosis	Marker of proliferation KI-67	KI-67	IHC	
			Tunel			
		Various markers/key receptors	Transforming Growth Factor Beta Receptor 2	TGFBR2	qRT-PCR	
Fibroblast Growth Factor 7	FGF7 (KGF)					



CUTECH Screening Services on Human Ex-vivo Models

(July 2019)

The list may not be exhaustive. For any special screening requirement, please contact us.

MODEL	APPLICATION	READ-OUT	LIST OF MARKERS/STAINING	ABBREVIATIONS	METHODOLOGY	
HAIR	Hair Pigmentation	Melanin amount	Fontana-Masson	FM	HC	
		Various markers	Pro-melanosome protein	PMEL (NKI-beteb)	IHC	
			Tyrosinase Related Protein 1	TYRP1		
			Tyrosinase	TYR		
	Oxidation	ROS			DCFH-DA	
Viability	Viability	Resazurin assay			C	
SEBACEOUS GLAND	Sebum Secretion (Skin)	Total Lipid quantification			Infrared Spectroscopy	
		Various markers	Fatty Acids Desaturase 2	FADS2	WB	
					qRT-PCR	
			Stearoyl-CoA Desaturase	SCD	WB	
			qRT-PCR			
			Peroxisome Proliferator Activated Receptor Alpha	PPARA	qRT-PCR	
	Sebum Secretion (Hair follicle)	Total Lipid quantification				Infrared Spectroscopy
		Various markers	Fatty Acids Desaturase 2	FADS2	WB	
				qRT-PCR		
Stearoyl-CoA Desaturase			SCD	WB		
		qRT-PCR				
		Peroxisome Proliferator Activated Receptor Alpha	PPARA	qRT-PCR		

Notes:

Possibility of executing more HC and IHC stains on the same experimental samples.
 Possibility of performing RNA sequencing or PCR array analysis.

Acronyms

C = Colorimetric
 DCFH-DA = Dichlorofluorescein diacetate assay
 GAG = Glycosaminoglycans
 HC = Histo Chemistry

IHC = Immuno Histo Chemistry
 qRT-PCR = Quantitative real-time polymerase chain reaction
 ROS = Reactive Oxygen Species
 WB = Western Blot

DISCLAIMER

"Symrise makes no warranties, either express or implied, as to the accuracy or completeness of the information set forth herein. Symrise expressly disclaims any implied warranty of merchantability and fitness for a particular purpose. Prospective users are requested to determine for themselves the suitability of Symrise materials and suggestions for any use prior to their utilization. Any necessary approvals from regulatory authorities for finished products must be obtained by the prospective user. Suggestions for applications involving our products or the reference to, or incorporation of, descriptive materials from patents and the citation of specific patents in this document may not be understood as recommendation for the use of Symrise products in violation of any patent or as a permission or licence to use any patent of Symrise or a third party."

www.symselect.com/cutech

© 2019 Symrise. All rights reserved.