



## CUTECH Screening Services Pipeline on Human Ex-vivo Models

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The list may not be exhaustive of the screening possibilities. For any special need, please contact us.

MODEL	CLAIM	READ-OUT	LIST OF MARKERS/STAINING	ABBREVIATION	METHODOLOGY	
	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		
			Dopachrome Tautomerase (Tyrosinase Related Protein 2)	DCT/TYRP2		
			Opsin 3 (Sensor for Blue light)	OPN3		
		Melan-A	MLANA			
	UVB-induced hyperpigmentation	Melanin	Fontana-Masson	FM	HC	
		Melan-A	Melan-A	MLANA	IHC	
		Total collagen	Total collagen	Picosirius 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 Metalloproteinase 1	MMP1	qRT-PCR	
					IHC	
		Mitochondrial markers	Translocase Of Outer Mitochondrial Membrane 20	TOMM20	IHC	
			Mitochondrial Dynamin Like GTPase	OPA1		
		Epidermis markers	Advanced glycation end products	AGE	IHC	
CD44 molecule				CD44		
Heparin Binding EGF Like Growth Factor	HBEGF					
Syndecan1	SDC					

<b>Aging</b>		Heat Shock Protein Family B (Small) Member 1	HSPB1		
		Crystallin Alpha B	CRYAB		
	Dermal-epidermal junction markers		Collagen type 7	COL7A1	IHC
			Collagen type 4	COL4A1	
			Laminin Subunit alpha 5	LAMA5	
			Tenascin C	TNC	
	Dermis markers		Tenascin X	TNX	IHC
			Collagen type 1	COL1A1	
			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			
<b>Photoaging*</b>	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	
	CHP	Collagen Hybridizing Peptide	CHP	IHC	
	TIMP	TIMP metalloproteinase inhibitor 1	TIMP1	IHC	
	MMP	Matrix Metalloproteinase 1	MMP1	qRT-PCR	
				IHC	
CCN1/CYR61	Cellular Communication Network Factor 1	CCN1/CYR61	IHC		
TRPV1	Transient receptor potential vanilloid 1	TRPV1	IHC		
	CPD	Cyclobutane pyrimidine dimers	CPD	IHC, IF	
	6-4 PPs	6-4 photoproducts	6-4 PPs	IF	

**SKIN**

<b>Oxidative stress</b>	ROS			DCFH-DA	
	Lipid oxidation	4 Hydroxynonenal	4-HNE	IHC	
	Protein oxidation (oxy-ELISA)			ELISA in tissue	
	Protein oxidation (oxyblot)			WB	
	AGE	Advanced glycation end products	AGE	IHC	
	Various markers	Glucose-6-phosphate dehydrogenase	G6PD/G6PDH		
		Catalase	CAT	qRT-PCR	
		Glutamate-Cysteine Ligase Catalytic Subunit	GCLC		
		Heme Oxygenase 1	HMOX1		
		NAD(P)H Quinone Dehydrogenase 1	NQO1		
	<b>Pollution</b>	ROS			DCFH-DA
		Protein oxidation (oxy-ELISA)			ELISA in tissue
		Protein oxidation (oxyblot)			WB
		Environmental sensor	Aryl hydrocarbon Receptor	AhR	IHC
		Barrier integrity	Rhodamine B		Rhodamine B
		Interleukin 8	Interleukin 8	IL-8	ELISA in medium
	<b>Moisturization</b>	Hyaluronic acid			ELISA in medium
					ELISA in tissue
		Acidic GAGs (Hyaluronic acid)	Alcian Blue	HA	HC
Sulfated GAGs		Toluidine Blue	TB	HC	
Various markers		Aquaporin 3	AQP3	IHC	
		Decorin	DCN		
		Heparan Sulfate Proteoglycan 2 (Perlecan)	HSPG2	IF	
		Lumican	LUM	IHC	
		Biglycan	BGN		
		Syndecan	SDC		
		Chondroitin sulfate	CS		
		Versican			
		Keratan sulfate	KS	IF	
	Heparan sulfate	HS	IHC		
Hyaluronan Binding Protein	HABP				
Hyaluronan Synthase	HAS2				
Filaggrin	Filaggrin	FLG	IHC		
Stratum corneum thickness	Haematoxylin Eosin	H&E	HC		

<b>Stratum Corneum Regeneration/Skin barrier</b>	Penetration assay	Rhodamine B		Rhodamine B	
	Various markers	Involucrin	IVL	IHC	
		Loricrin	LOR		
		Keratin 5	KRT5		
		Keratin 10	KRT10		
		Keratin 14	KRT14		
		Kallikrein Related Peptidase 5	KLK 5		
		Kallikrein Related Peptidase 7	KLK7		
		Occludin	OCLN		
		Claudin 1	CLD1		
		Desmocollin 1	DSC1		
		Desmoglein 1	DSG1		
		Bleomycin Hydrolase	BLMH		
		E-cadherin	CDH1		
		Olfactory Receptor Family 2 Subfamily AT4	OR2AT4		
		3-Hydroxy-3-Methylglutaryl-CoA Reductase	HMGCR		IHC
		Peptidase Inhibitor 3	Pi3		qRT-PCR
		S100 Calcium Binding Protein A7	S100A7		IHC
Transglutaminase 1	TGM1	IHC, qRT-PCR			
UDP-Glucose Ceramide Glucosyltransferase	UGCG	WB			
		qRT-PCR			
<b>Epidermis Regeneration</b>	Epidermal recovery	Keratin 14	KRT14	IHC	
	Morphology	Haematoxylin Eosin	H&E	HC	
	Various markers	Integrin Subunit Beta 1	ITGB1	IHC	
		Keratin 6	KRT6		
		Alpha smooth muscle Actin	ACTA2		
<b>Retinoid response</b>	Various markers	Aldehyde Dehydrogenase 1 Family Member A3	ALDH1A3	IHC	
		Heparin Binding EGF Like Growth Factor	HBEGF	qRT-PCR	
		Cellular Retinoic Acid Binding Protein 2	CRABP2		
		Keratin 4	KRT4		
<b>Inflammation SDS</b>	Interleukins	Interleukin 1 alpha	IL-1alpha	ELISA in medium	
		Interleukin 6	IL-6		
		Interleukin 8	IL-8	ELISA in medium, IHC	

	IL-1alpha UV	Prostaglandins	Prostaglandin E2	PGE2	ELISA in medium
			Cyclooxygenase-2	PTGS2/COX2	IHC
		PCR array (inflammation)			qRT-PCR
	<b>Irritation</b> (e.g. induced by SDS)	Interleukins	Interleukin 1 alpha	IL-1alpha	ELISA in medium
			Interleukin 6	IL-6	
			Interleukin 8	IL-8	
	<b>Steroidogenesis</b>	Various markers	Hydroxysteroid 11-Beta Dehydrogenase 1	HSD11B1	IHC
			Hydroxysteroid 17-Beta Dehydrogenase 1	HSD17B1	
			Hydroxysteroid 17-Beta Dehydrogenase 2	HSD17B2	
	<b>Autophagy</b>	ATG4B	Autophagy Related 4B Cysteine Peptidase	ATG4B	IHC
BECN1		Beclin 1	BECN1		
<b>Epidermal thickening</b>		Haematoxylin Eosin/Picrosirius Red	H&E/ PSR	HC	
<b>SUBCUTIS</b>	<b>Fat Management</b>	Free glycerol release			C
		Total Lipid quantification			Infrared Spectroscopy
		Various markers	Leptin	LEP	qRT-PCR
			Adiponectin	ADIPOQ	WB
					qRT-PCR
<b>HAIR</b>	<b>Viability</b>	Viability	Resazurin assay		C
		Morphology	Haematoxylin Eosin	H&E	HC
	<b>Hair Growth</b>	Hair shaft elongation			Stereomicroscope
		Cell proliferation/apoptosis	Marker of proliferation KI-67	KI-67	IHC
			Tunel		
		Various markers	Transforming Growth Factor Beta Receptor 2	TGFBR2	qRT-PCR
	Fibroblast Growth Factor 7		FGF7 (KGF)		
	<b>Hair pigmentation</b>	Melanin amount	Fontana-Masson	FM	HC
		Various markers	Pro-melanosome protein	PMEL (NKI-beteb)	IHC
			Tyrosinase Related Protein 1	TYRP1	
			Tyrosinase	TYR	
<b>Oxidation</b>	ROS			DCFH-DA	
<b>Viability</b>	Viability	Resazurin assay		C	
	Total Lipid quantification			Infrared Spectroscopy	
		Fatty Acids Desaturase 2	FADS2	WB	

<b>SEBACEOUS GLAND</b>	<b>Sebum secretion (Skin)</b>	Various markers	Fatty Acids Desaturase 2	FADS2	qRT-PCR
			Stearoyl-CoA Desaturase	SCD	WB
			Peroxisome Proliferator Activated Receptor Alpha	PPARA	qRT-PCR
	<b>Sebum secretion (Hair follicle)</b>	Total Lipid quantification			Infrared Spectroscopy
			Fatty Acids Desaturase 2	FADS2	WB
		Various markers	Stearoyl-CoA Desaturase	SCD	WB
					qRT-PCR
			Peroxisome Proliferator Activated Receptor Alpha	PPARA	qRT-PCR
<b>Notes:</b>					
Possibility of executing more HC and IHC stains on the same experimental samples.					
Possibility of performing RNA sequencing or customized PCR array analysis.					
*Available irradiation sources: UVA, UVB, UVA/UVB, Visible light and Blue light					
<b>Acronyms</b>					
C = Colorimetric					
DCFH-DA = Dichlorofluorescein diacetate ass					
GAG = Glycosaminoglycans					
HC = Histo Chemistry					
IHC = Immuno Histo Chemistry					
qRT-PCR = Quantitative real-time polimerase					
ROS = Reactive Oxygen Species					
WB = Western Blot					
IF= Immunofluorescence					