

## Development of novel products for improvement of skin health

*6th International Conference on Cosmetology, Trichology & Aesthetic Practices*

**MANU JAGGI**

**Dabur Research Foundation**

**22, Site IV, Sahibabad**

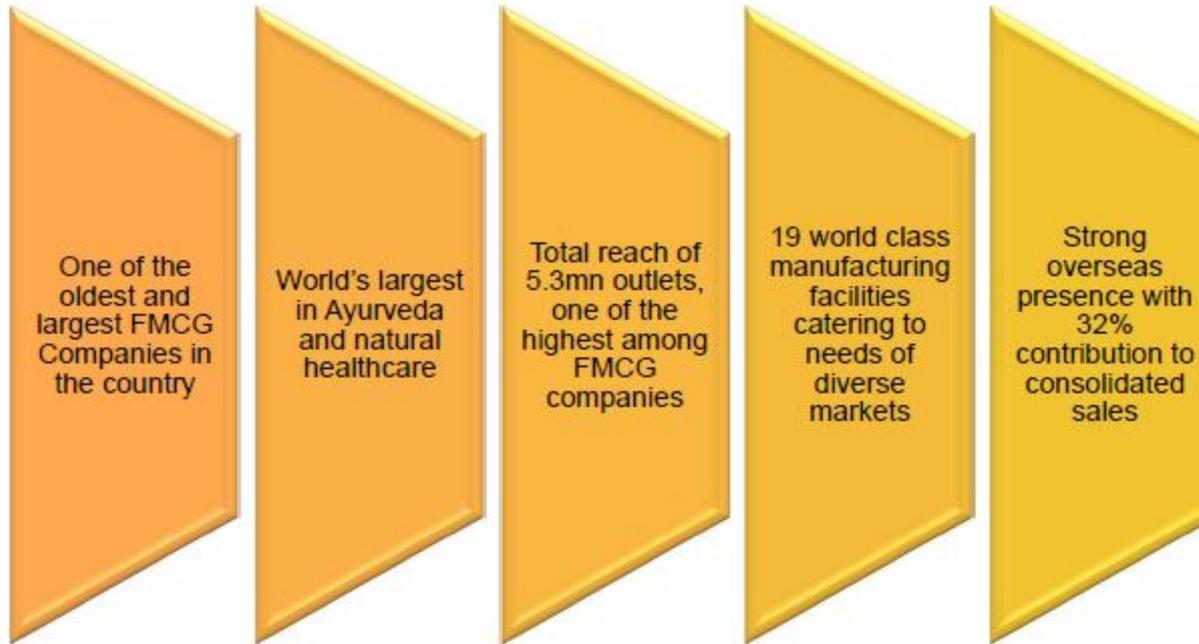
**Ghaziabad – 201010**

**Uttar Pradesh, INDIA**

**[www.daburresearch.in](http://www.daburresearch.in)**

- ✓ Dabur : Bringing goodness of Ayurveda to Cosmetics
- ✓ Scientific development of safe & effective cosmetic products
- ✓ Case Studies
- ✓ Our Recent Innovations in Cosmetics

“DEDICATED TO THE HEALTH AND WELL BEING OF EVERY HOUSEHOLD”



## Key Markets





## Seven International Manufacturing Locations





**“AYUR” + “VEDA” = SCIENCE OF LIFE**

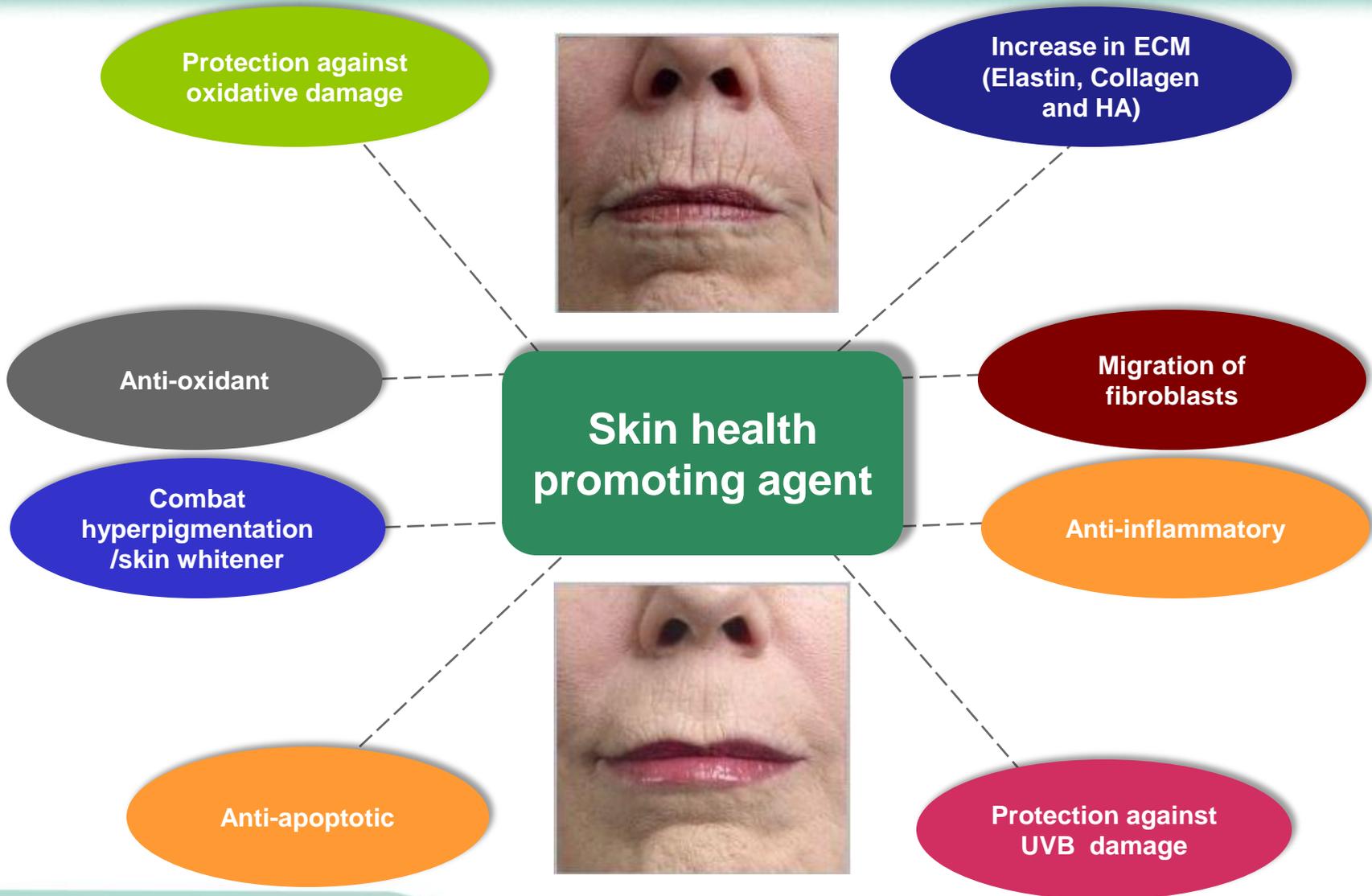
Ayurveda is the traditional system of healthcare which promotes **PREVENTION FIRST** and **CURE NEXT**

Ayurveda is based upon Natural Remedies which incorporate the healing properties of plants and herbs.



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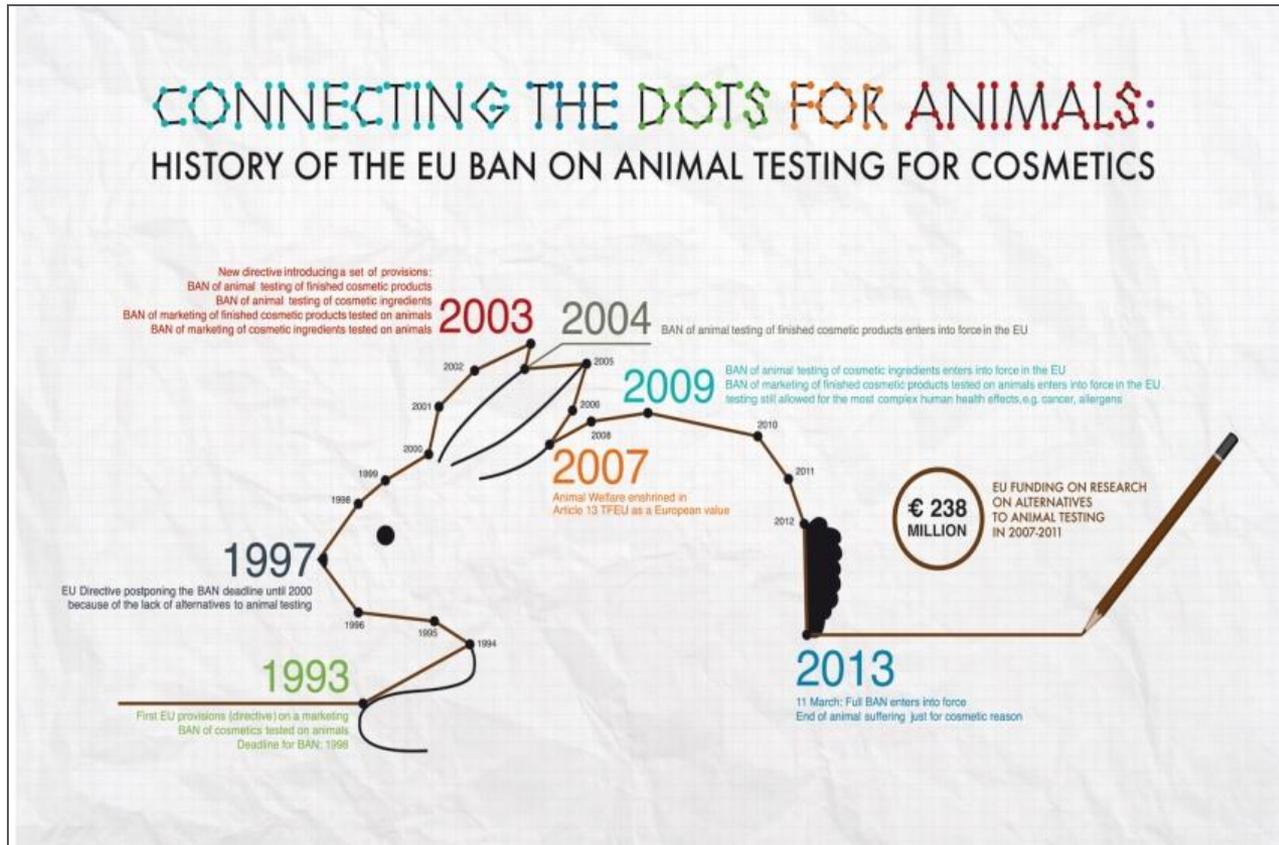


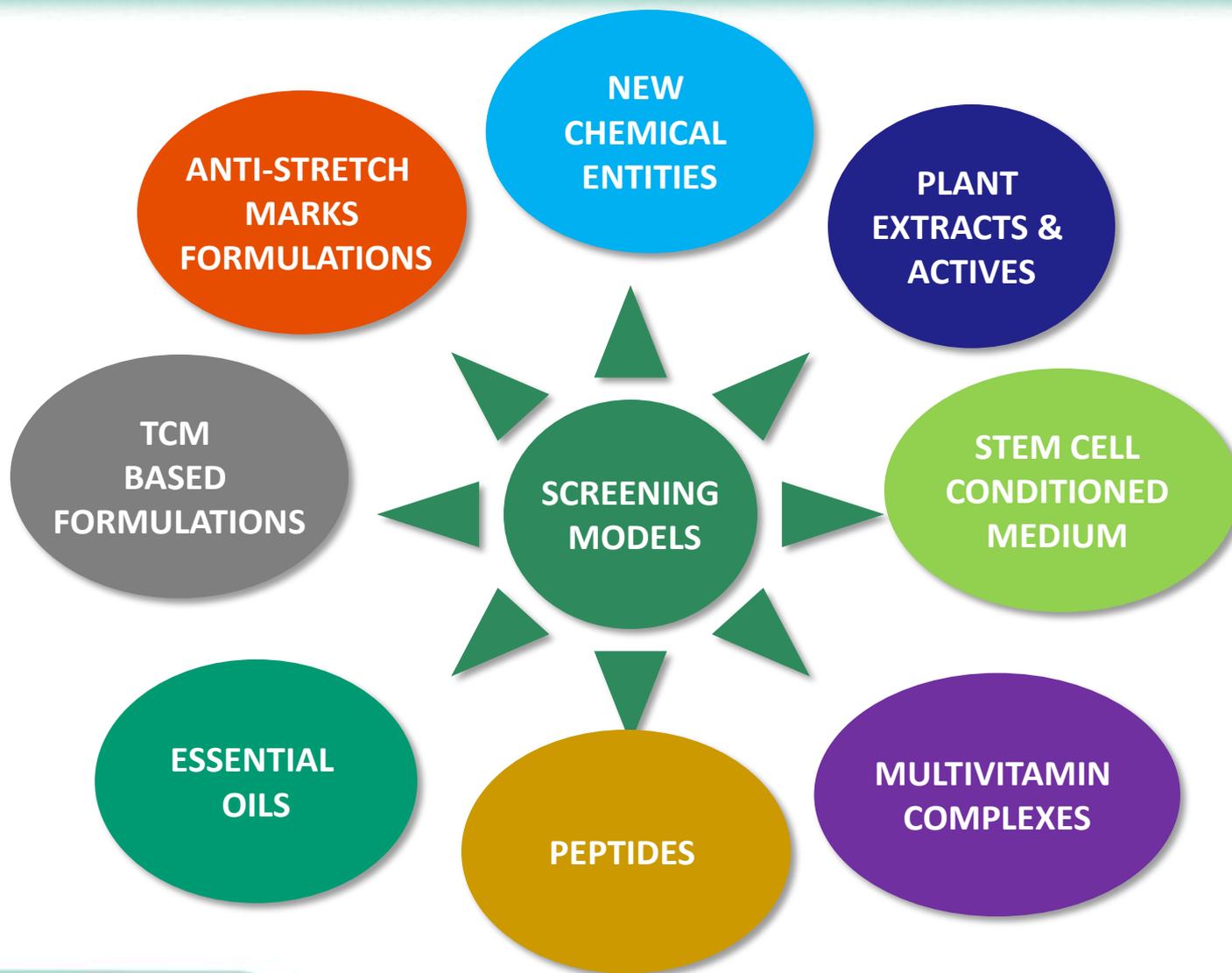
A variety of skin care products are available commercially that target multiple problems for a young healthy skin. The product can target conditions such as aging, acne, hyperpigmentation, dryness, sun damage, inflammation, redness, oily skin etc.

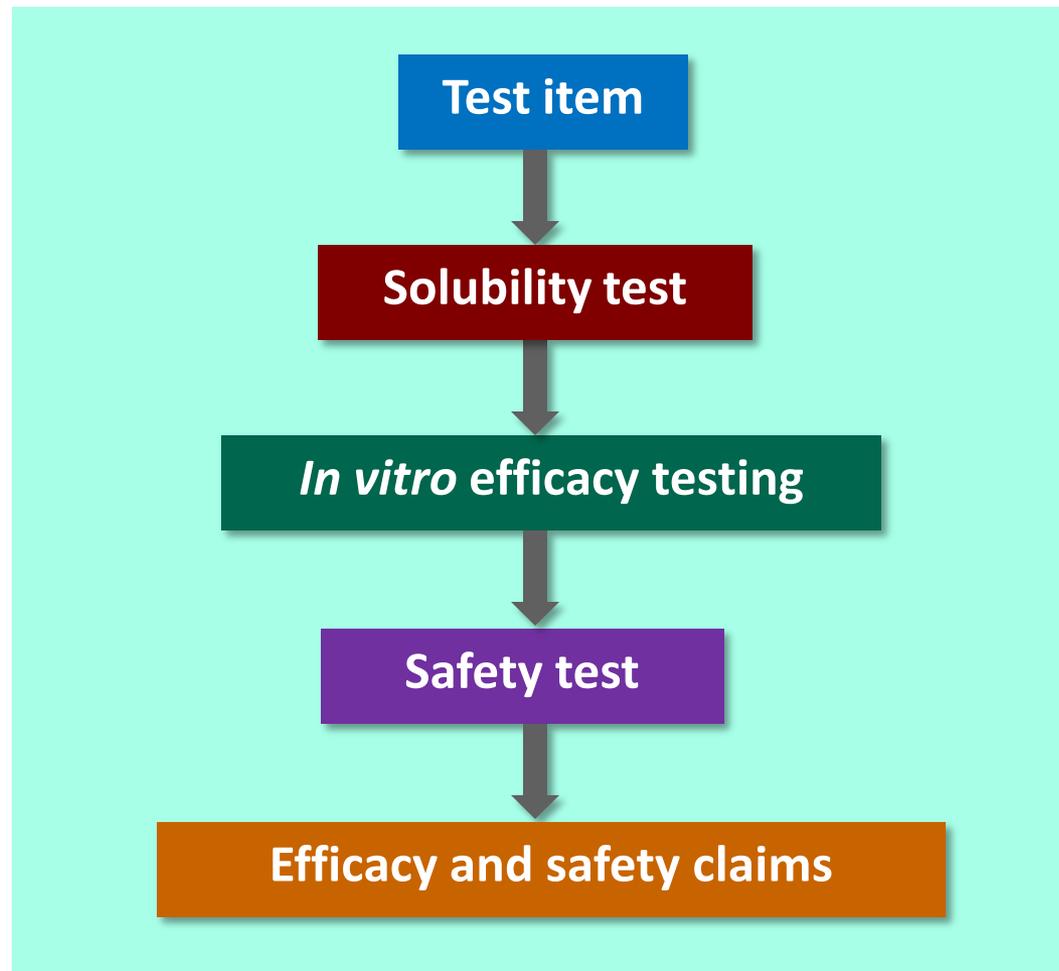
The main ingredients can be one/more of the following:

- Alpha-hydroxy acids (AHAs)
- Beta-hydroxy acid (salicylic acid)
- Hydroquinone
- Kojic Acid
- Retinol
- L-Ascorbic Acid
- Hyaluronic Acid
- Copper Peptide

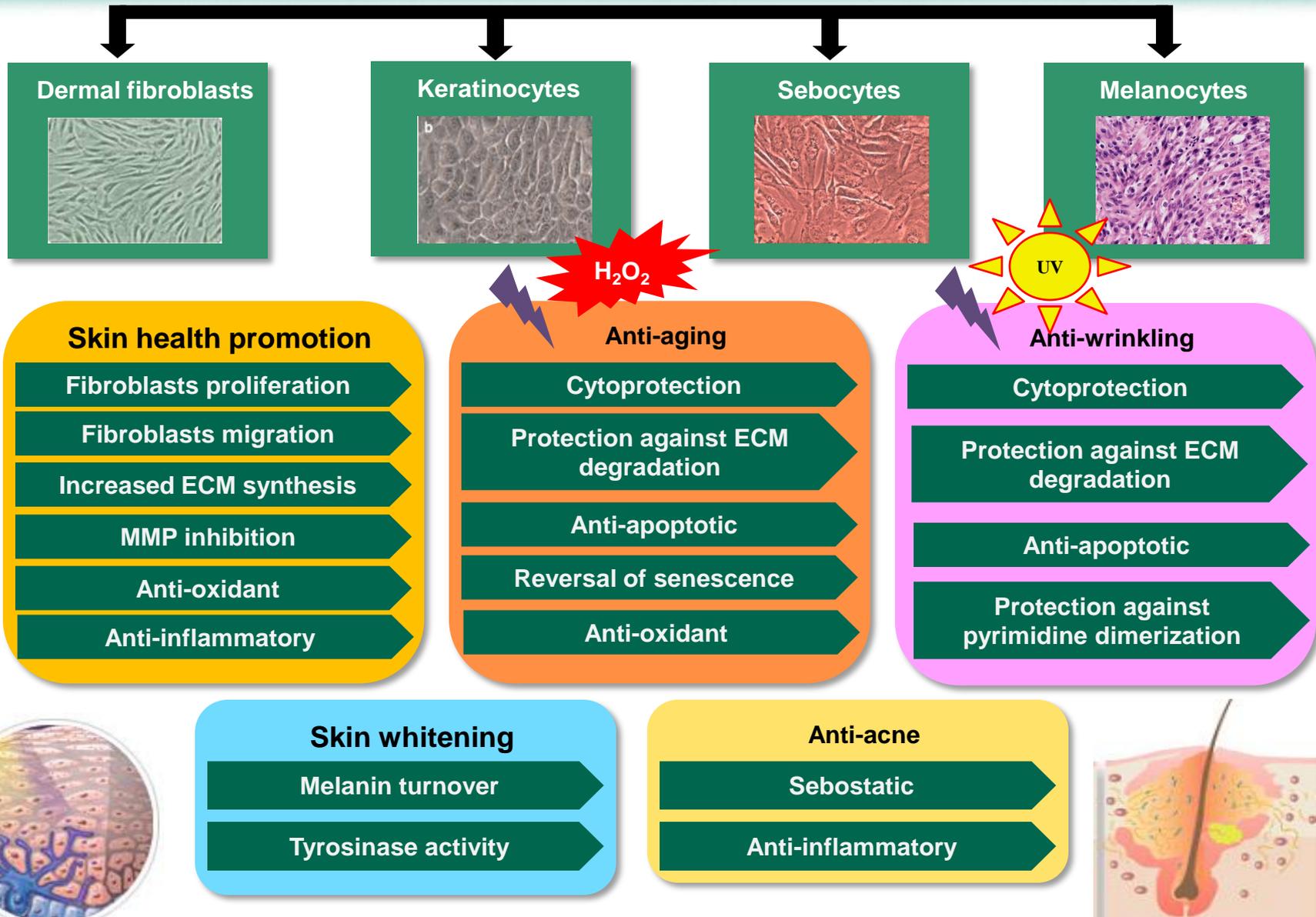
- Alpha-Lipoic Acid
- DMAE (dimethylaminoethanol)
- Plant extracts
- Plant actives
- Herbal oils
- Plant stem cells
- Stem cells conditioned medium
- Peptides
- Vitamin E







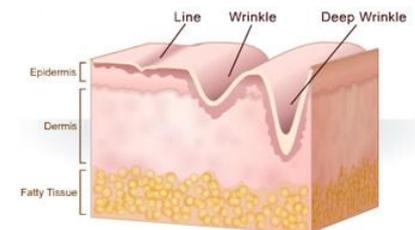
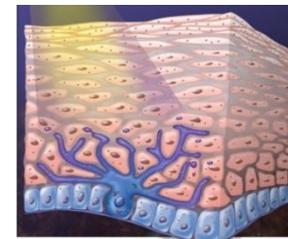
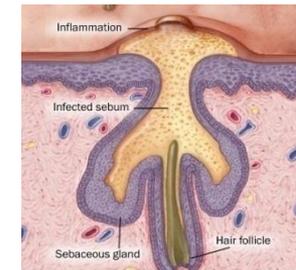
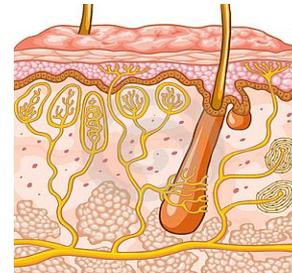
# Cell types and parameters for skin health



*A repertoire of in vitro, in vivo & ex vivo models for evaluating products for their effect on skin*

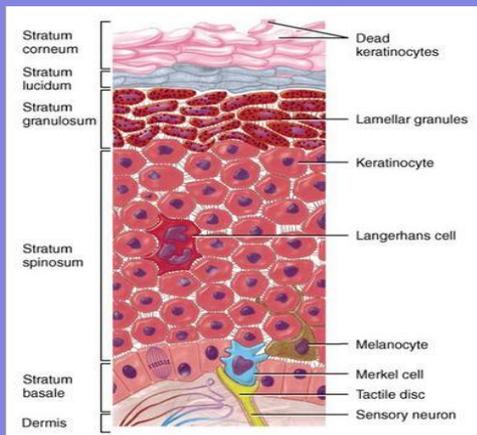
## Parameters :

- Skin Health
- Anti-ageing
- Anti-wrinkling
- Skin whitening/depigmentation
- Sunprotection
- Anti – inflammatories
- Anti – oxidants
- Skin barrier / permeability assessment
- Dermal safety
- **Acne**
- **Psoriasis & Scalp psoriasis**
- **Seborrhoea**
- **Eczema**
- **Atopic Dermatitis**



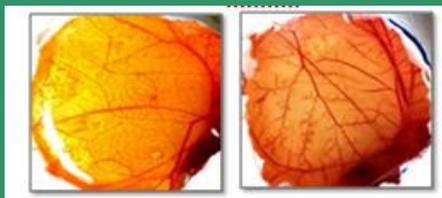
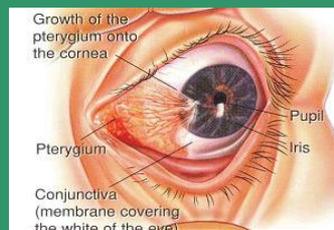
## Skin irritation

- Keratinocytes
- Fibroblast cell line
- 3-D reconstructed skin (OECD)



## Ocular irritation

HET-CAM assay (*in vitro*)



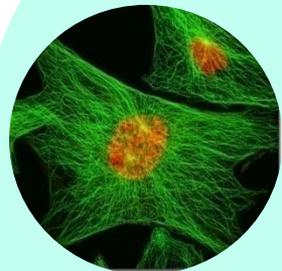
## Genotoxicity (OECD)

- Ames
- *In vitro* CA
- *In vivo* MNT



# Screens for Skin health promotion/anti-aging potential

## Primary screening (*in vitro*) Human skin fibroblasts



- Fibroblast proliferation ↑
- ECM synthesis ↑
- MMP-1 & MMP-9 ↓
- Collagenase, Elastase, Hyaluronidase ↓
- Skin pigmentation ↓
- Anti-oxidant activity ↑

## Secondary screening (*in vivo*) UVB induced wrinkling in mice



- Visual wrinkling ↓
- Skin hydration ↑
- Erythema ↓
- Skin thickness ↓
- ECM synthesis ↑
- Inflammation ↓
- Hyperkeratosis ↓



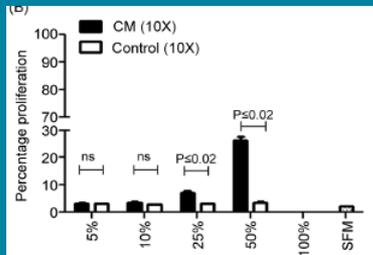
## Case studies

## Evaluation of skin health promoting potential of Conditioned medium from mesenchymal stem cells

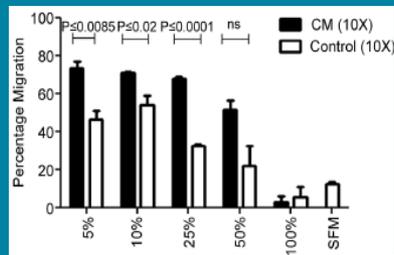
- ❑ Human Fibroblast (HFF-1) proliferation and migration
- ❑ Elastin, and cyclin-B1 y ELISA in culture supernatants ,
- ❑ Cell cycle by flow cytometry

### RESULTS

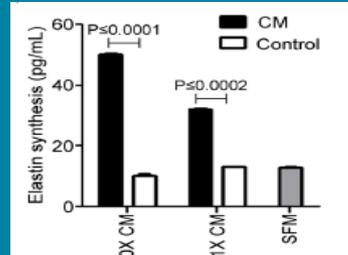
#### Fibroblasts proliferation



#### Cell migration

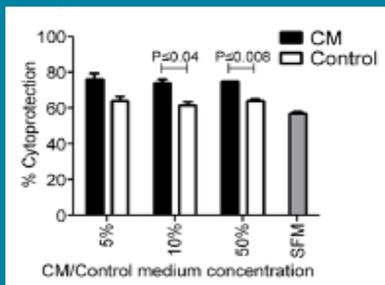


#### Elastin

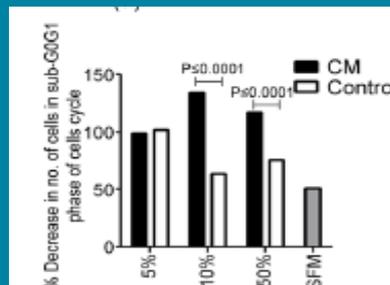


### Protection against oxidative stress

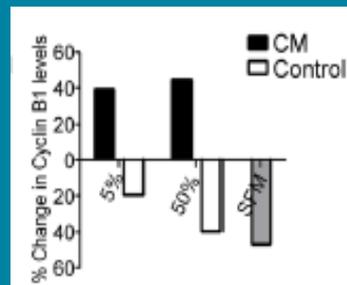
#### Cell viability



#### Cell cycle



#### Anti-senescence



Skin health promoting and anti-aging properties of DRF-01



Fibroblasts turnover



Cell repair



Skin elasticity



Antioxidant



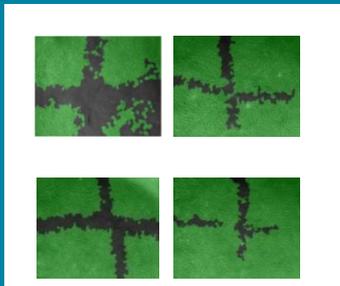
Senescence

## Evaluation of skin health and anti-aging potential of Herbo-mineral formulation

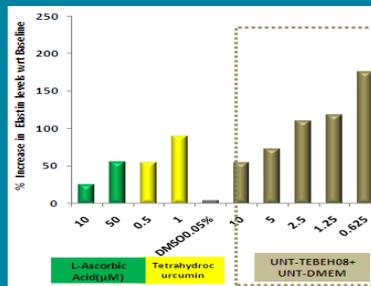
- Migration assay in Human fibroblasts (HFF-1)
- Elastin, and Hyaluronic acid (HA), by ELISA in culture supernatants, Collagen by sircol dye based colorimetric method
- Melanin synthesis by NaOH extraction

## RESULTS

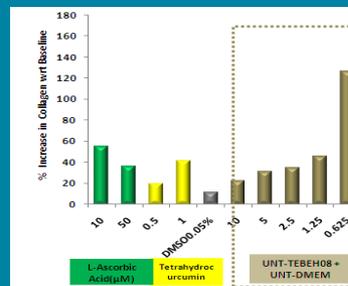
### Cell migration



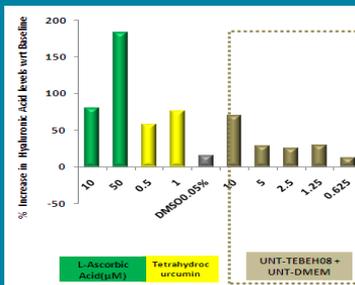
### Elastin



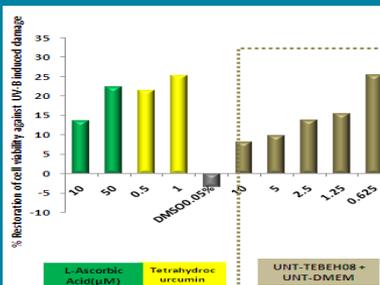
### HA



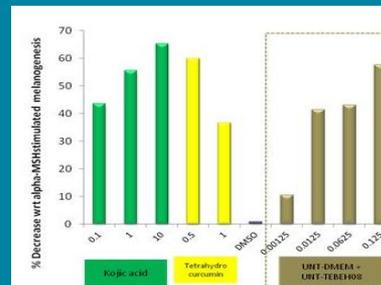
### Collagen



### Viability against UVB



### Melanin inhibition



Skin health promoting, anti-aging and skin-whitening properties of DRF-03



Skin repair



Skin elasticity



Skin hydration and moisture



Skin strength



Skin damage



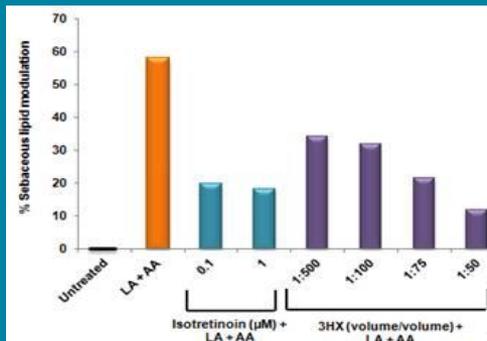
Fairness

## Evaluation of anti-seborrheic potential of TCM based anti-acne gel

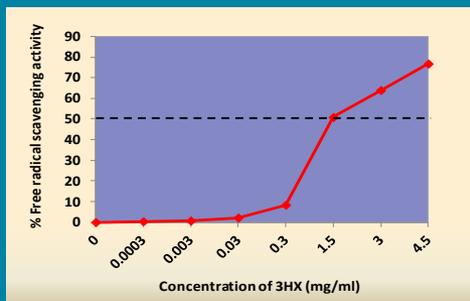
- Lipid accumulation in human sebocytes by Oil-O Red staining
- Cell migration in human fibroblasts
- Anti-oxidant potential by ABTS assay

## RESULTS

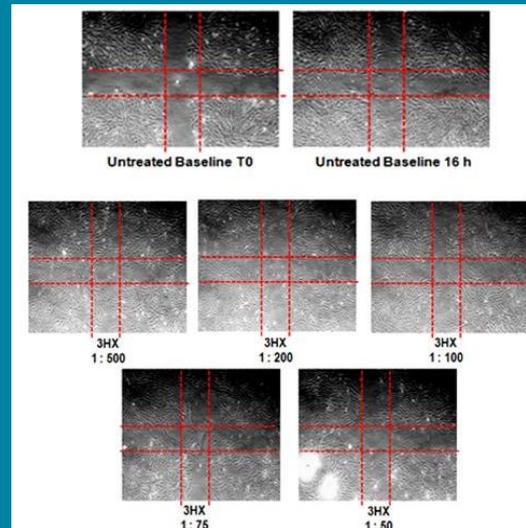
### Lipid accumulation in sebocytes



### Anti-oxidant



### Cell migration



Anti-acne and skin repair potential of DRF-04



Sebum production



Skin repair



Antioxidant



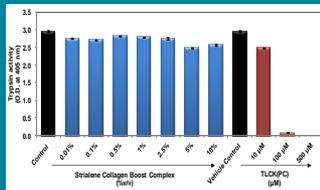
## Evaluation of anti-stretch marks potential of herbal cream

- Inhibition of proteolytic enzymes in cell-free assays
- ECM markers in human fibroblasts (HFF-1) by ELISA
- IL-6 inhibition in keratinocytes (HaCaT) by ELISA

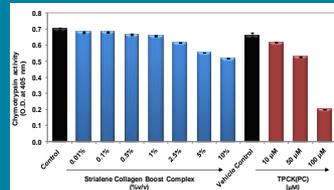
### RESULTS

#### Inhibition of proteolytic enzymes

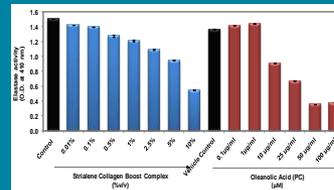
##### Chymotrypsin



##### Trypsin

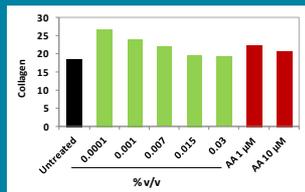


##### Elastase

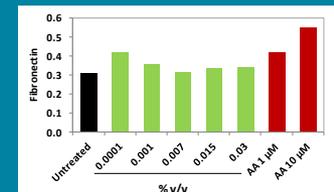


#### ECM markers in HFF-1 cells

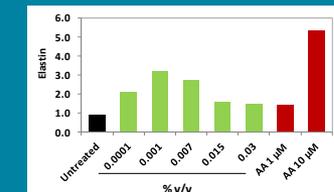
##### Collagen



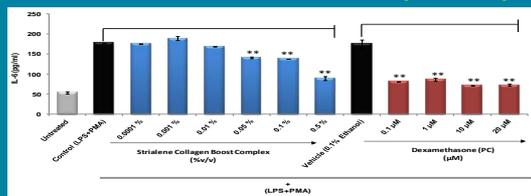
##### Fibronectin



##### Elastin



#### IL-6 inhibition in skin cells (HaCaT)



Anti-stretch marks potential of DRF-06



Skin matrix degradation by proteolytic enzymes



Skin quality – ECM markers

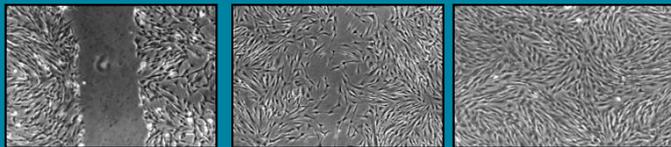


Skin inflammation

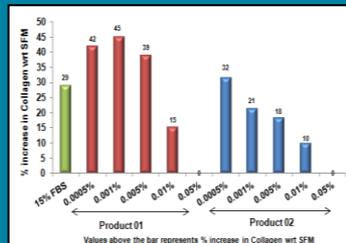
## Evaluation of skin health promoting potential of DRF-09

- ECM markers in Human Fibroblast (HFF-1)
- Collagen estimation by sircoll dye based colorimetric method
- Elastin and HA by ELISA in culture supernatants

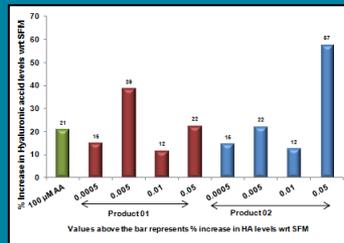
### Cell migration



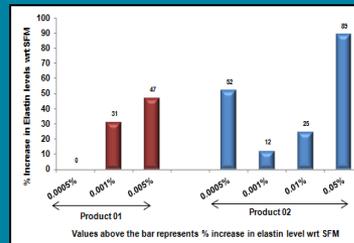
#### Collagen



#### HA

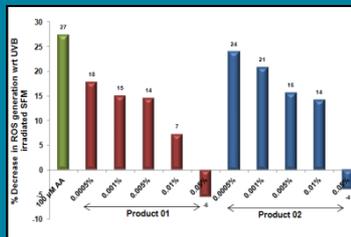


#### Elastin

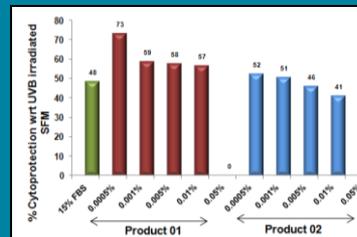


### Protection against UVB damage

#### Cell viability



#### ROS generation



Skin health promoting and anti-aging properties of DRF-01



Cell repair



Skin elasticity



Skin hydration and moisture



Skin strength



Antioxidant



Dermoviva Facial Fluid Range



Amla Men  
Hair Tonic



Herbal Olive Enamel Care  
Toothpaste



Vatika Shampoo  
Relaunch



Dermoviva Baby Range- Olive  
Enriched Powder  
and Olive Baby Soap



Vatika Stand Tough  
Styling Gel

33



Olive Oil Range- Shampoo, Conditioner, Mask and Mousse



Curls Unleashed- Shea Butter & Honey Curl Defining Cream

Monoi Oil Range- Shampoo, Conditioner, Illuminating Spray and Oil Fusion



## Namaste



**Key Geographies** USA & Africa

Straightening

Styling

Shampoo & Conditioner

## Hobi

Hair Care



Body Wash



Hair Styling



Liquid Soap



**Key Geography** Turkey

Shampoo

Hair  
Styling

Liquid  
Soap

Skin &  
Body Care

## Cosmetic Team

