ex vivo Skin model: an alternative tool for efficacy assessment

Silva, Michelle Sabrina; Facchini, Gustavo; Pinheiro, Ana Lucia Tabarini Alves; Eberlin, Samir; Pinheiro, Adriano da Silva; Eberlin, Samara.

Michelle Sabrina, Ph.D

2nd PAN-AMERICAN Conference for Alternative Methods
August 23-24, 2018
Rio de Janeiro

Grupo kosmo science

BACKGROUND

1

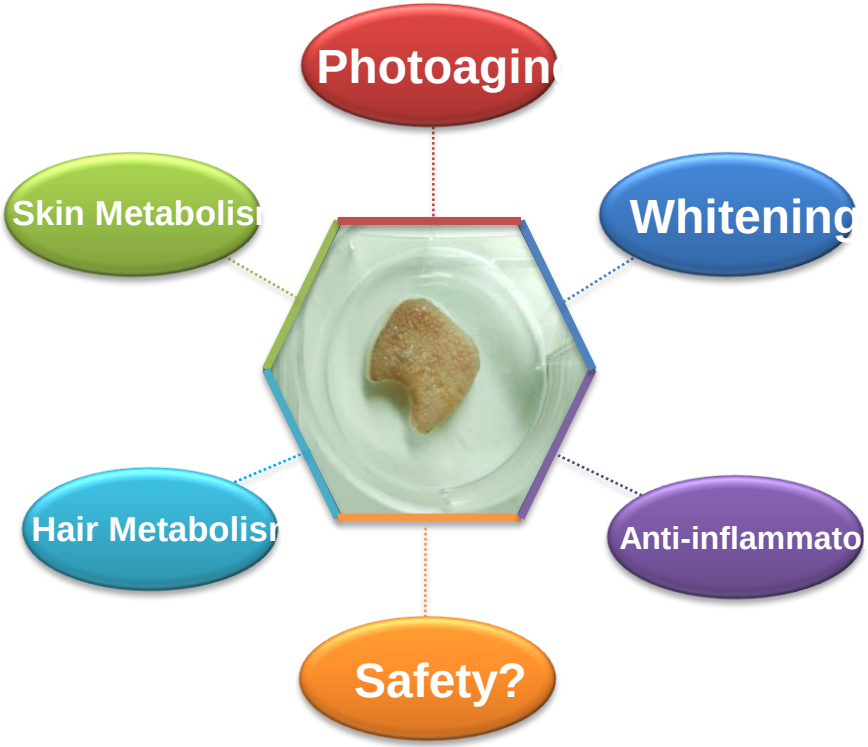
Increasing complexity and similarity to in vivo systems

Culture Type	Suitability/Limitations
Mitotic cell lines	Medium to high throughput studies of basal toxicity (e.g., membrane damage, viability, etc.) and cell proliferation. If immortalized, many cell lines are tumor-like. Limited cell–cell interactions and drug metabolism.
Differentiating cell lines	Medium to high throughput screening and mechanistic studies of developmental toxicity and target cell specific toxicity. Often short-lived. Limited cell–cell interactions and drug metabolism.
Primary cell cultures	Developmental or target cell-specific toxicity. Genetically more similar to target system but generally heterogeneous and short-lived. Can be used as coculture systems (e.g., reaggregates) to simulate cell–cell interactions of target tissue but usually have limited drug metabolism.
Organotypic/whole organ cultures	These are tissue slices or cultures organs that can maintain cell interactions and tissue function. Generally unsuitable for medium to high throughput analysis and may exhibit limited drug metabolism.

- High disponibility - Brazil is among the first placed in the number of elective surgical procedures aesthetic[2];
- Great approximation to the real conditions of the human body
- Sustainability
- Ready-to-use

[1]CHAPTER 9 - TOXICOLOGICAL TESTING: IN VIVO AND IN VITRO MODELS (SACHANA M. & HARGREAVES A.J., 2008).

EX VIVO SKIN MODEL – A TOLL BOX



Abdominoplasty

"human Skin abdominal explant cultured - **hSaec**"

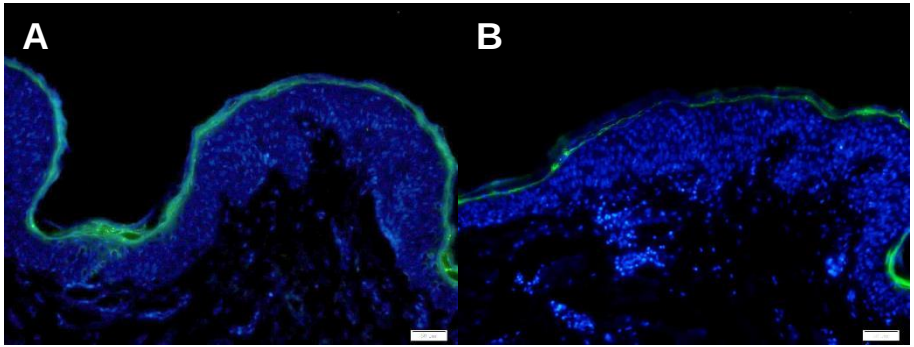
Rhytidoplasty

"human Scalp explant cultured - **hSec**"

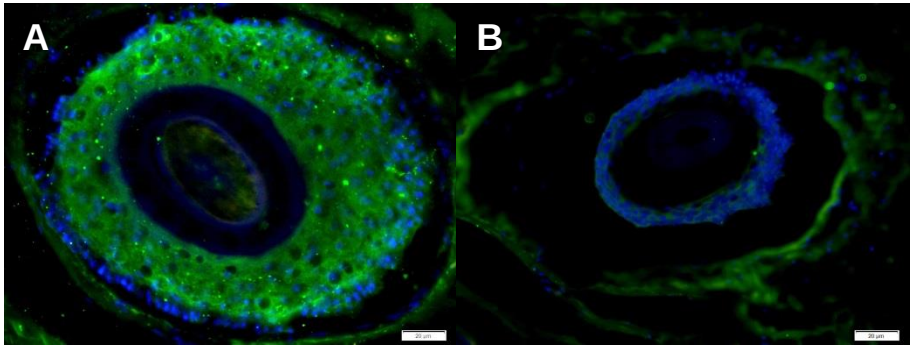
ALL STUDIES WERE CONDUCTED ONLY AFTER THE APPROVAL OF ETHICS COMMITTEE AND ACCORDING WITH HELSINK DECLARATION.

Grupo kosmo science

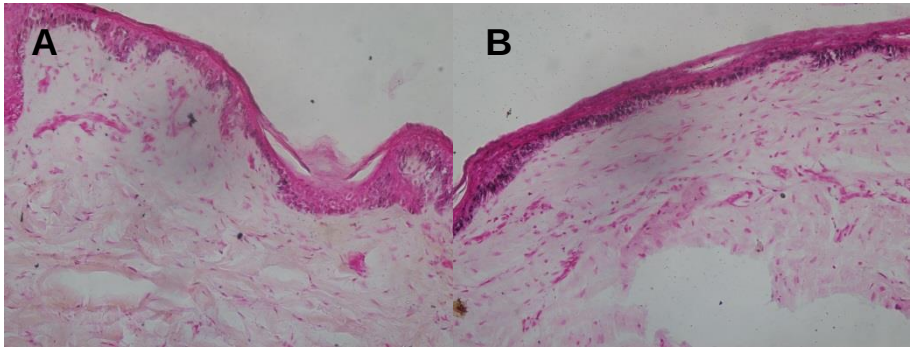
Previous Results



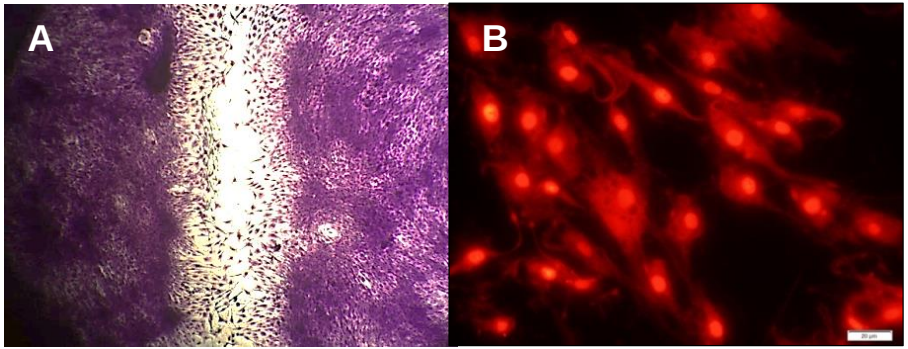
Envelope Proteins – Filaggrin
A: Control; B: Barrier disruption.



Aging Hair – ColXVIIa1: Impairment of the stem cell niche
A: Control; B: Stress.



Skin Pigmentation – Fontana-Masson Technique
A: Control; B: Visible Light.



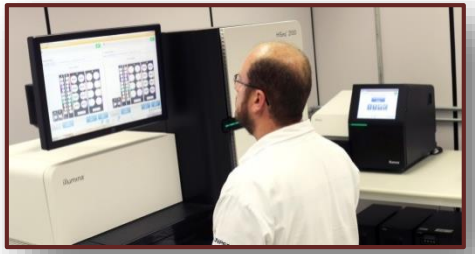
Primary Cultures – Fibroblasts, Keratinocytes, Adipocytes…
A: Cell Migration; B: Oxidative Stress.

TRANSCRIPTOME ANALYSIS OF HUMAN SKIN EXPOSED TO IR-A RADIATION

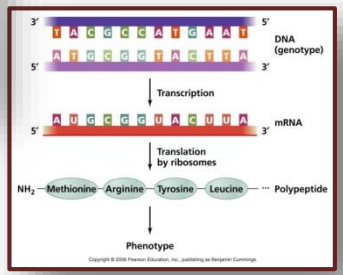
Identification of new biomarkers for IR-A damage on *ex vivo* skin model to efficacy studies of cosmetic and pharmacological formulations using mRNA Seq.

ex vivo **Skin Model - hSaec**

360 J/cm^2 for 5 days; N= 10



Analysis of Gene Expression in Large Scale



RNA whole extraction

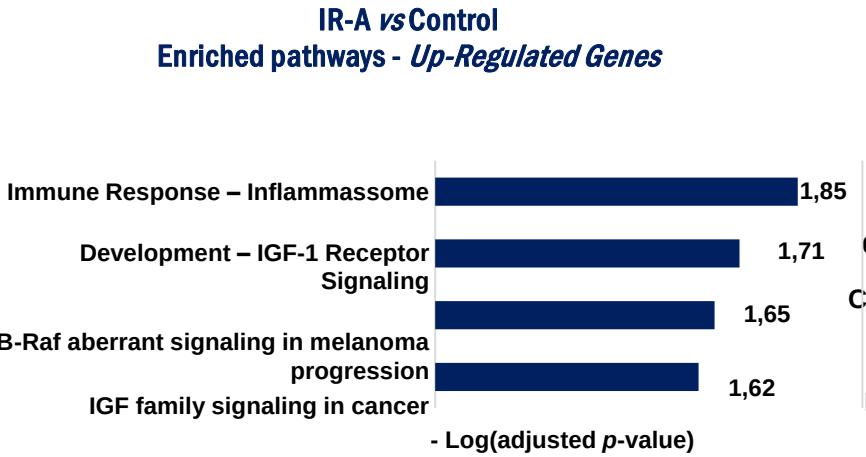
Cosmetics research firm uses discarded plastic surgery material instead of animals

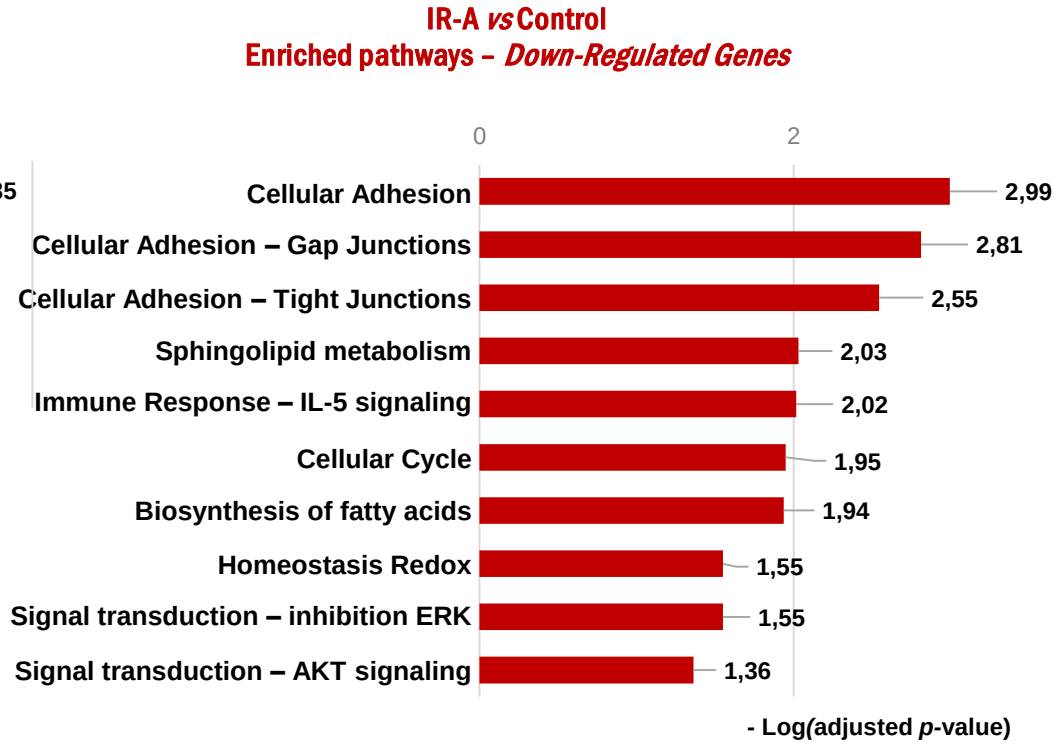
Partnership:
Dr André Schwambach Vieira
Institute of Biology
State University of Campinas/SP

PROCESS: 2015/08598-8

ORAL PRESENTATION 30TH IFSCC

TRANSCRIPTOME ANALYSIS OF HUMAN SKIN EXPOSED TO IR-A RADIATION





PROCESS: 2015/08598-8

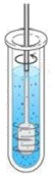
PROTEOMIC ANALYSIS OF HUMAN SCALP EXPOSED TO UVA/B RADIATION

Understand the mechanisms associated with hair photodamage and scalp disorders induced by UVA/B radiation through proteomic analysis.

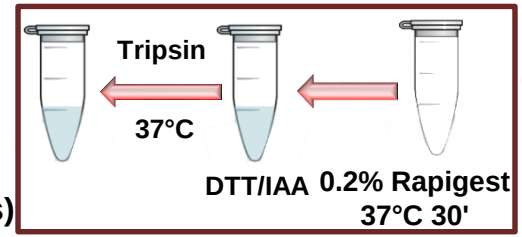
ex vivo Human Scalp Model

10 J/cm² UVA/B radiation for 5 days

SOLUBILIZATION



- Ureia
- Thiureia
- DTT

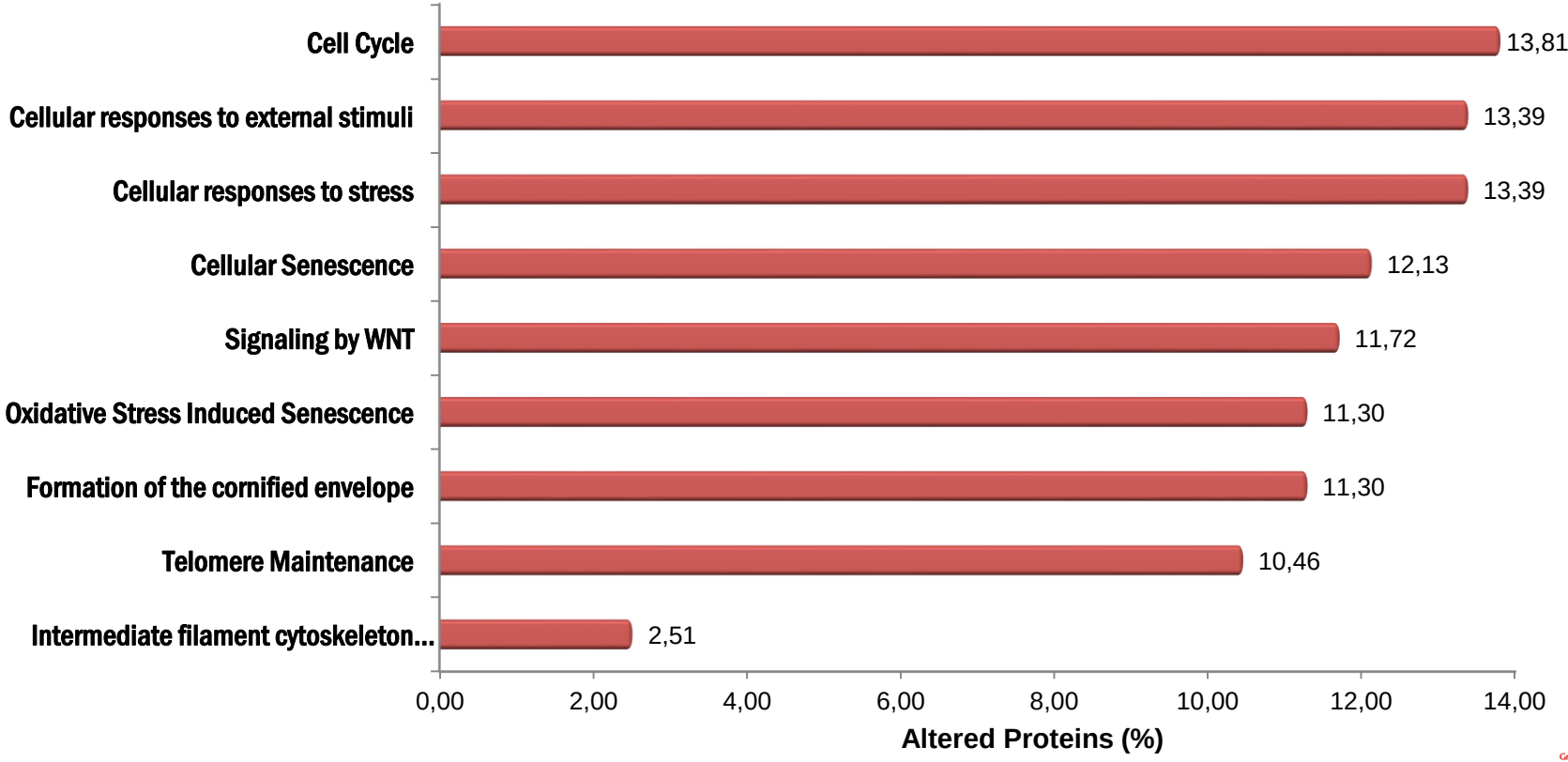


nanoAcquity Systems - UPLC/Xevo G2 Q-ToF MS (Waters)

Partnership:
Dr Marilia Afonso Rabelo Buzalaf
Dr Aline Lima Leite
School of Dentistry Bauru
University of São Paulo, Bauru/SP, Brazil

POSTER PRESENTATION 30º IFSCC

PROTEOMIC ANALYSIS OF HUMAN SCALP EXPOSED TO UVA/B RADIATION

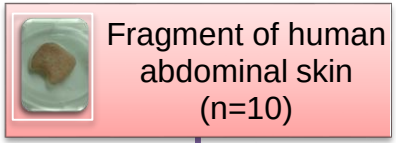


Current Steps… "The enhancement of Human skin Models"

Standardization of a test system with high reproducibility that provides greater scientific backing allowing the advancement of studies involving the use of *ex vivo* skin fragment in trials of efficacy and safety for products of topical use.

FAPESP

Process: 2017/15935-6



THANK YOU!

sabrina@kosmoscience.com

Grupo kosmo science