BACKGROUND

Ultraviolet-B (UVB)-induced morphological changes in cultured fibroblasts have been systematically studied in the past decades in relation with photoprotective strategies.

AIM

The present study was aimed at providing a comprehensive characterization of a human dermal fibroblast cell line (HDFa) in terms of:

- morphological and phenotypical aspects
- mitochondrial function and bioenergetics.

MATERIAL AND METHODS

- Morphology of HDFa line was assessed by:
  - light microscopy.
  - immunofluorescence.

- Flow cytometry was used for the evaluation of the following surface markers: CD34, CD45, CD90, CD73, CD44, CD29, CD117, HLA-A2, CD105, CD109, CD29, IL-10R, HLA-DR, and TGF-βRII.

- Mitochondrial bioenergetics was measured by using Seahorse Bioscience XF24 extracellular flux analyzer. - 10K, 20K, and 30K cells were seeded in order to obtain the optimal seeding density.

- OCR (oxygen consumption rate) and ECAR (extracellular acidification rate) were evaluated at 37°C.

RESULTS

Morphology of normal HDFa cells

- HDFa cells have elongated shapes, are adherent, and expand rapidly in culture.

Molecular markers expression of normal HDFa cells

- HDFa express CD90, CD73, CD29 and HLA-DR.
- HDFa are negative for CD34, CD45, CD44, CD117, CD105, CD109, CD29, IL-10R, HLA-DR, and TGF-βRII.

Mitochondrial function and bioenergetics of normal HDFa cells

- Mitochondrial respiratory rates corrected for oxygen flux due to instrumental background and ROX.
- Respiratory control ratio (RCR) was calculated as the ratio between ETS and LEAK state.

Conclusion

Characterization of HDFa cell line was performed in order to further report on their changes in response to different protocols of UVB exposure in the presence vs. the absence of protective phototherapies.