

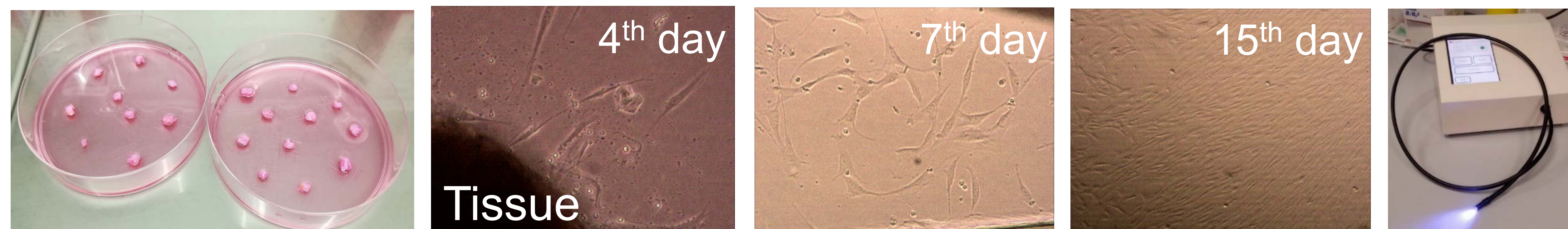
An *in vitro* study on keloid fibroblasts irradiated by a Blue LED light device

G. Magni, F. Rossi, M. Banchelli, P. Matteini, R. Pini - IFAC-CNR

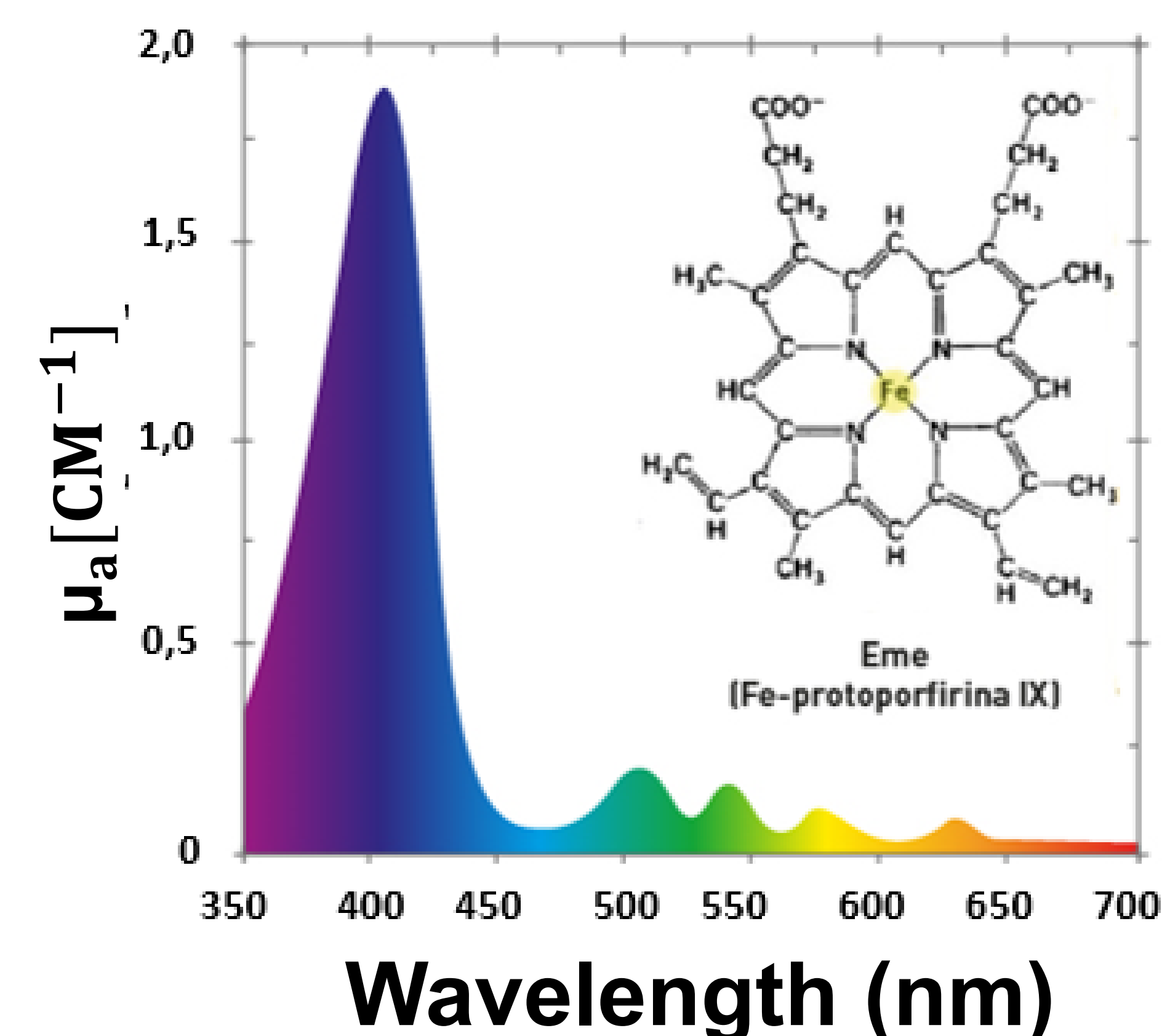
F. Cherchi, E. Coppi, A.M. Pugliese - University of Florence, dept. NEUROFARBA

M. Fraccalvieri - AOU Città della Salute e della Scienza di Torino

F.S. Pavone - Lens



VISIBLE LIGHT
ABSORPTION OF
PROTOPHYRIN IX



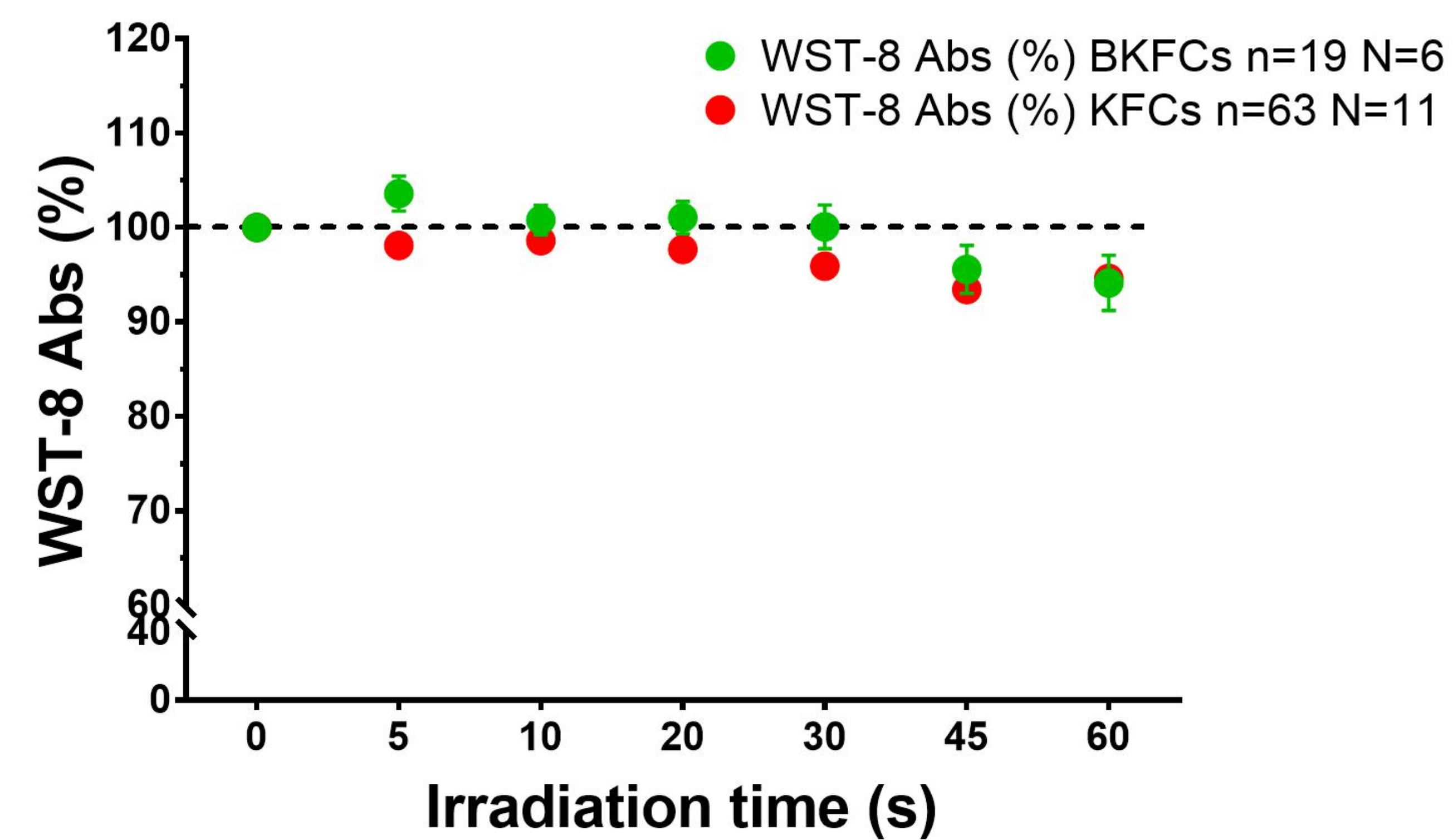
Treatment times (s)	Fluence (J/cm ²)
5	3.43
10	6.87
20	13.7
30	20.6
45	30.9
60	41.2

Results (1)

Human keloid fibroblasts metabolism and proliferation analysis

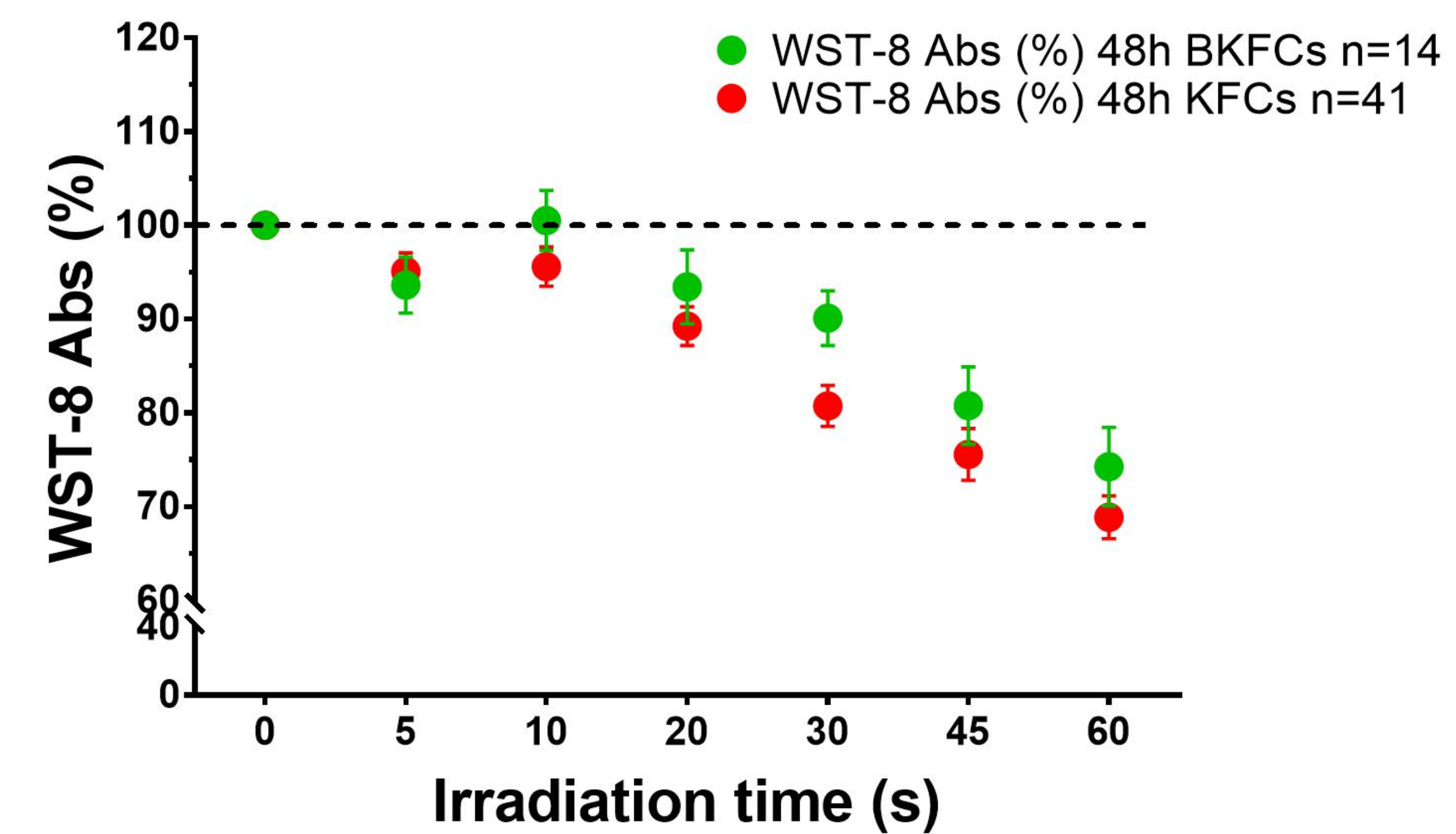
@24h

Cell metabolism

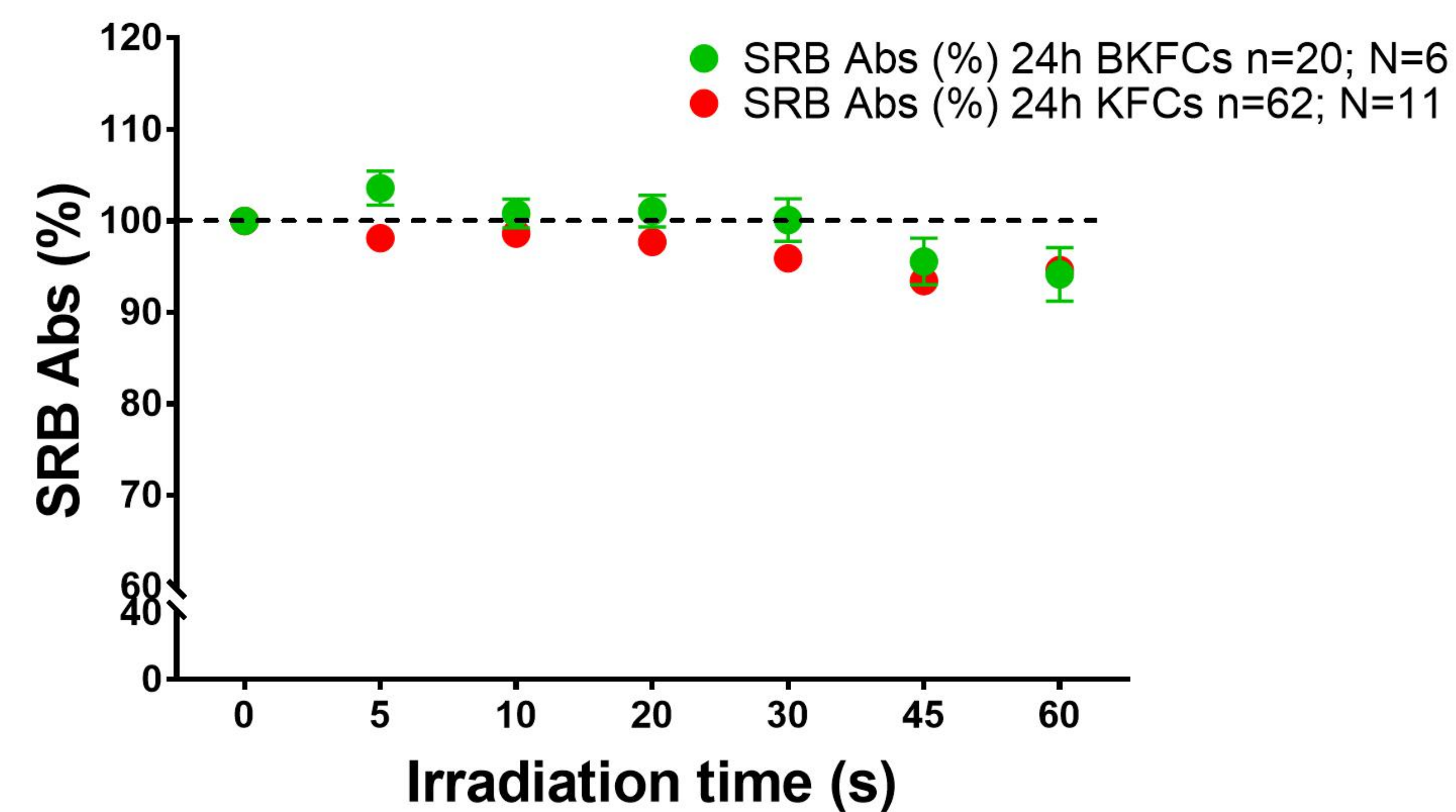


@48h

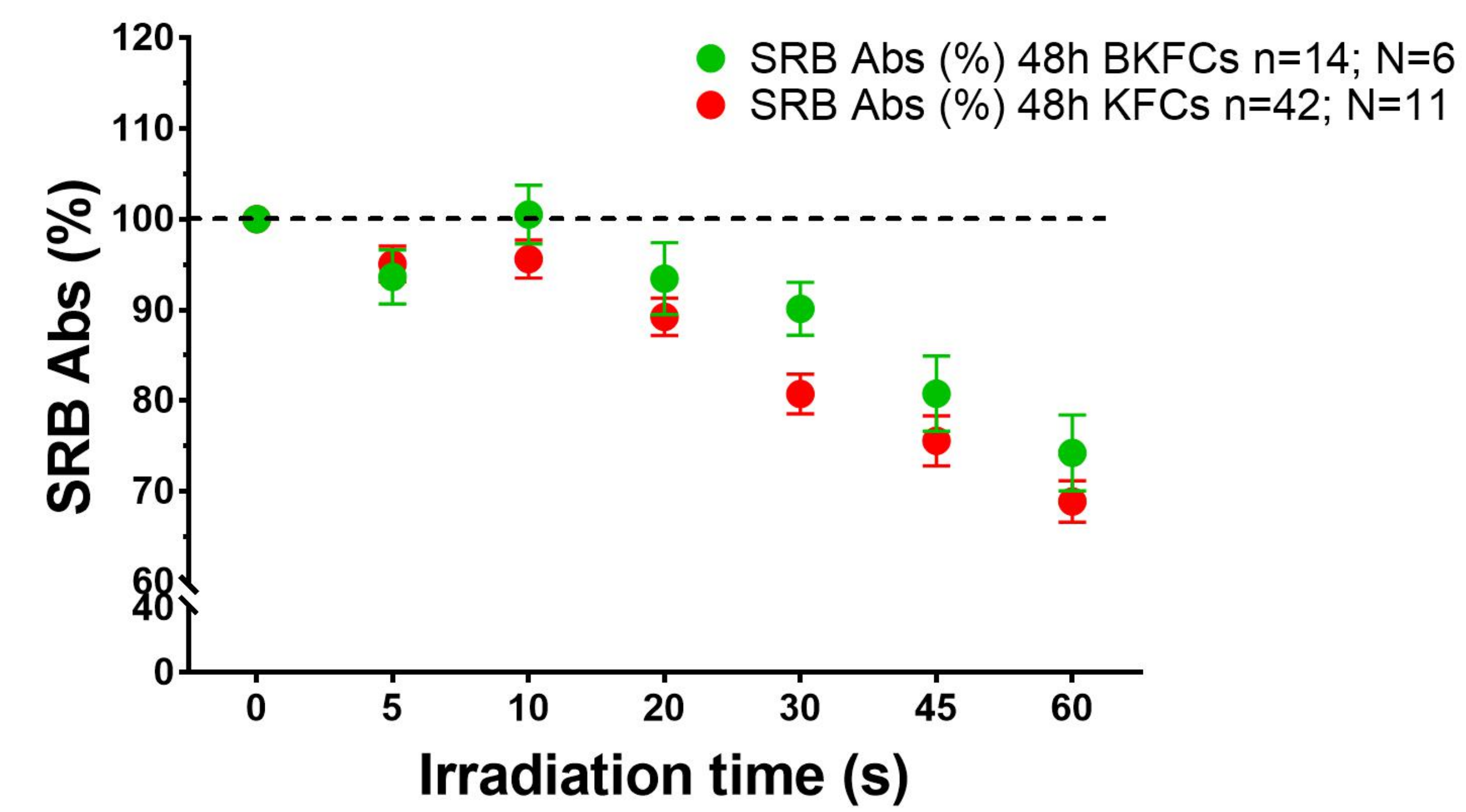
Cell metabolism



Cell proliferation



Cell proliferation

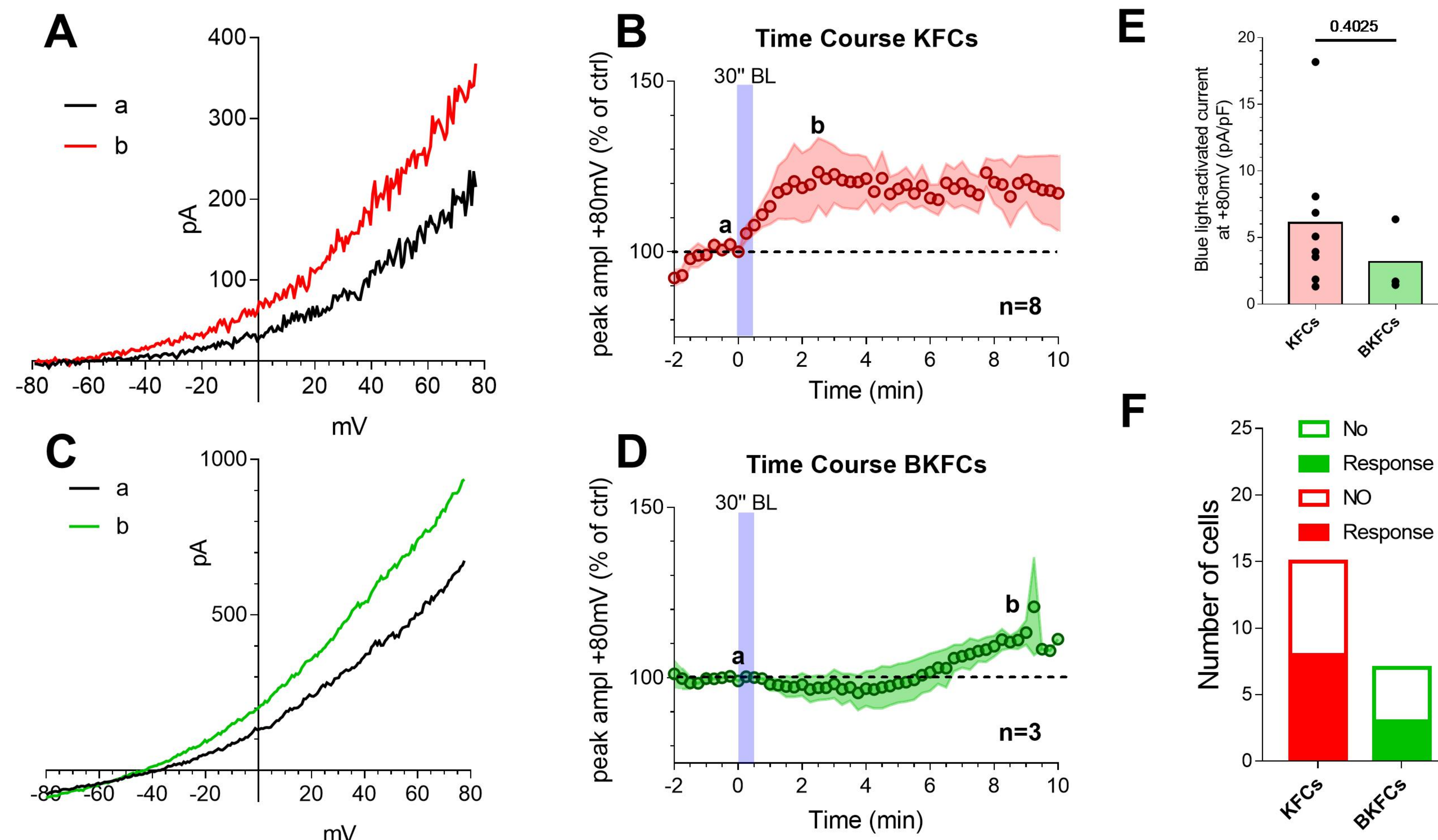


■ Boundary keloid fibroblast cells (BKFCs)
■ Keloid fibroblast cells (KFCs)

Cells metabolism (measured by WST-8 absorbance) and proliferation (measured using Sulforhodamine absorbance) in comparison on BKFCs and KFCs.

Results (2)

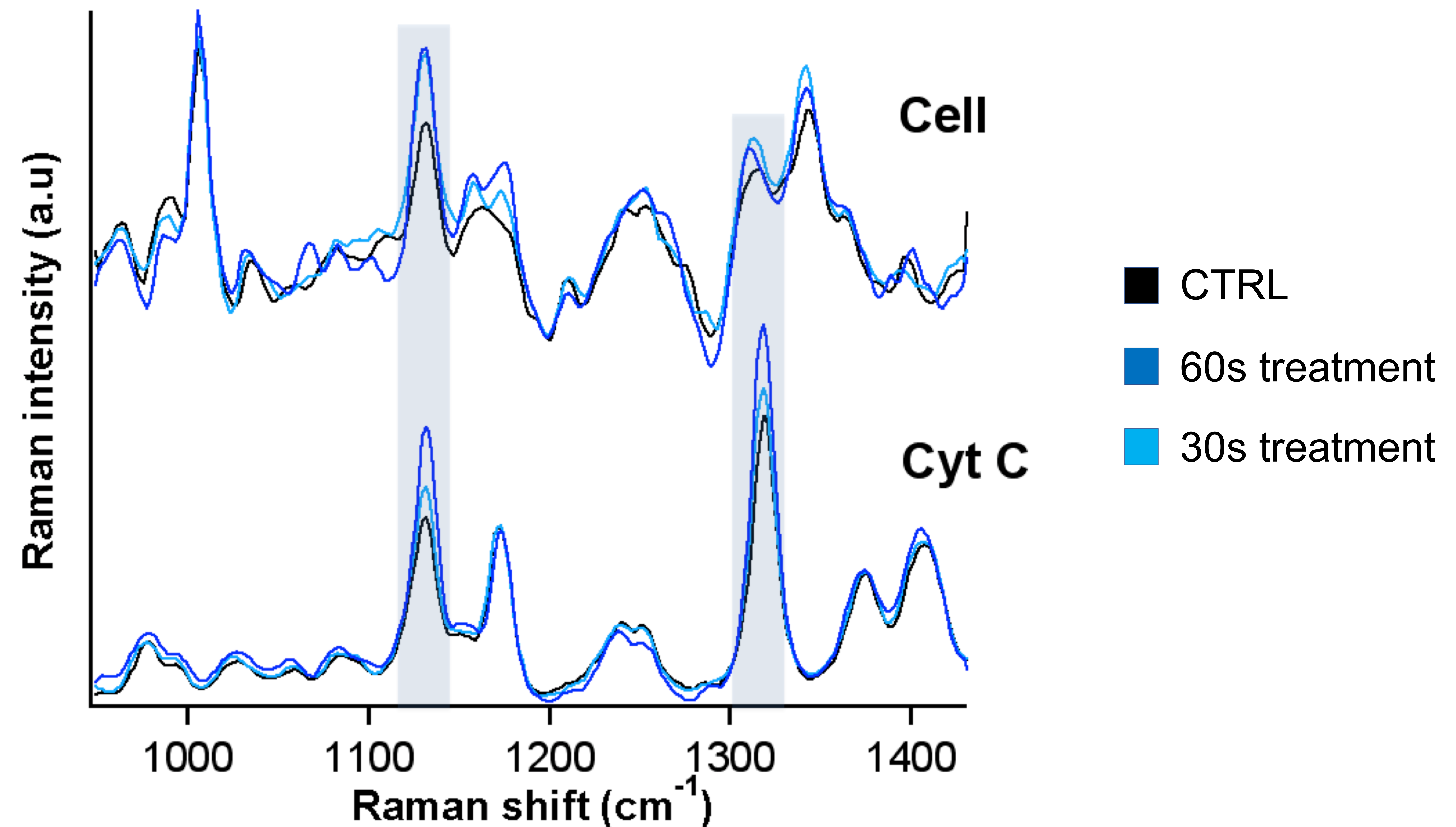
Patch-clamp recordings in human BKFCs and KFCs



A. Original ramp current traces recorded before (a) or 3 minutes (b) after the application of 30s Blue LED light in a KFC. **B.** Averaged time course of ramp evoked currents at +80 mV in KFCs (n = 8). **C.** Original ramp current traces recorded before (a) or 9 minutes (b) after the application of 30s Blue LED light in a BKFC. **D.** Averaged time course of ramp evoked currents at +80 mV in BKFCs (n=3). **E.** Pooled data of Blue LED light-activated currents in the same cells, in KFCs (n = 8) or in BKFCs (n = 3). P = 0.4025, unpaired Student's t-test. **F.** The fraction of cells that responded (filled bars) or not (open bars) at Blue LED irradiation over the totality of KFCs (red) or BKFCs (green)

Results (3)

Cytochrome C analysis on single fibroblast cell



Raman spectra of unirradiated (black) and 30s (light blue), 60s (dark blue) irradiated samples in the case of fibroblasts and Cyt C solution. Raman bands of interest are highlighted.

Conclusion

- Both fibroblasts from keloid and boundary tissue are sensitive to irradiation with the Blue LED light
- Fibroblasts reduce their metabolism at 24 hours and their proliferation rate at 48 hours after treatment and this effect increases with irradiation time
- Blue LED light irradiation increases ramp-evoked outward currents in either human keloid fibroblasts and boundary keloid fibroblasts
- The change in Cytochrome C redox state after treatment suggested that could be involved in the mechanism of action of Blue LED light