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PHOTOBIOSTIMULATION (PBS) WITH INFRARED LED LIGHT (E-LIGHT®D TECHNOLOGY) AS AN ADJUNCTIVE THERAPY IN CHRONIC PERIODONTITIS: A PRELIMINARY STUDY

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Introduction

The final scope of periodontal treatment is the removal of supragingival and subgingival plaque biofilm from the root surface, to reduce or arrest the progression of periodontal disease by mechanical debridement.

Non-surgical treatment of chronic periodontitis, mainly consists of mechanical debridement (scaling and root planing SRP) and usually results in significant clinical improvement. However, SRP alone may fail to eliminate subgingival bacteria located in areas inaccessible to periodontal instruments.

Adjunctive procedures to periodontal therapy, such as locally delivered or systemic antibiotics have been evaluated. Although the adjunctive use of antibiotics may be effective in the elimination of periodontal germs, the frequent use of antibiotics could lead to side effects or to the development of bacterial resistance.

Is there a role for other less invasive adjuvant therapies in managing periodontal disease?

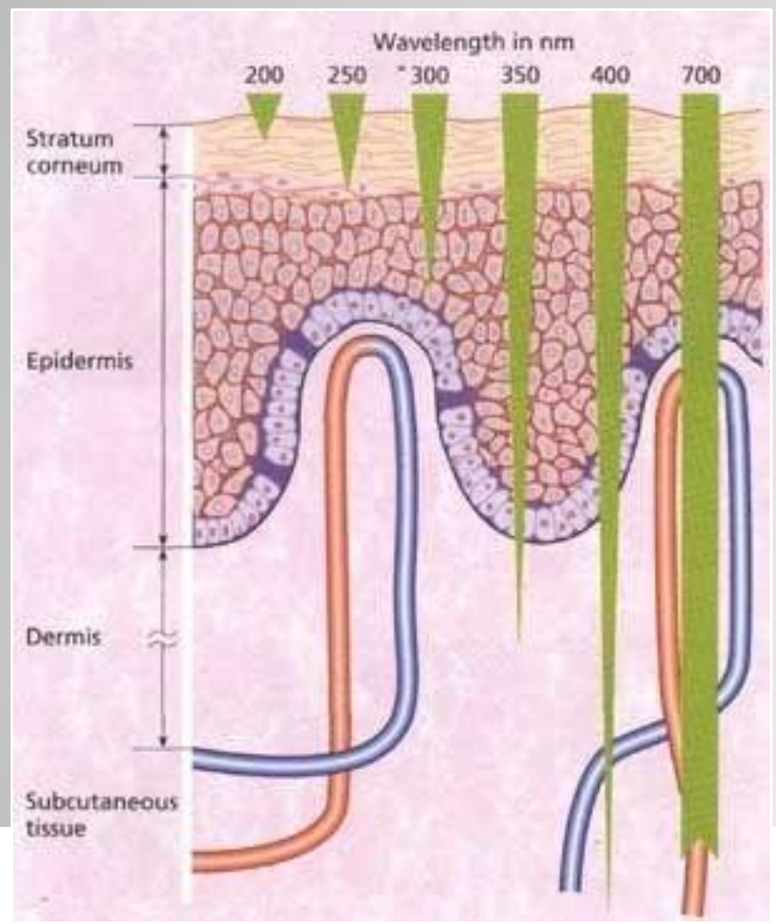
Pubmed search (Medline) keywords:
led light periodontal:

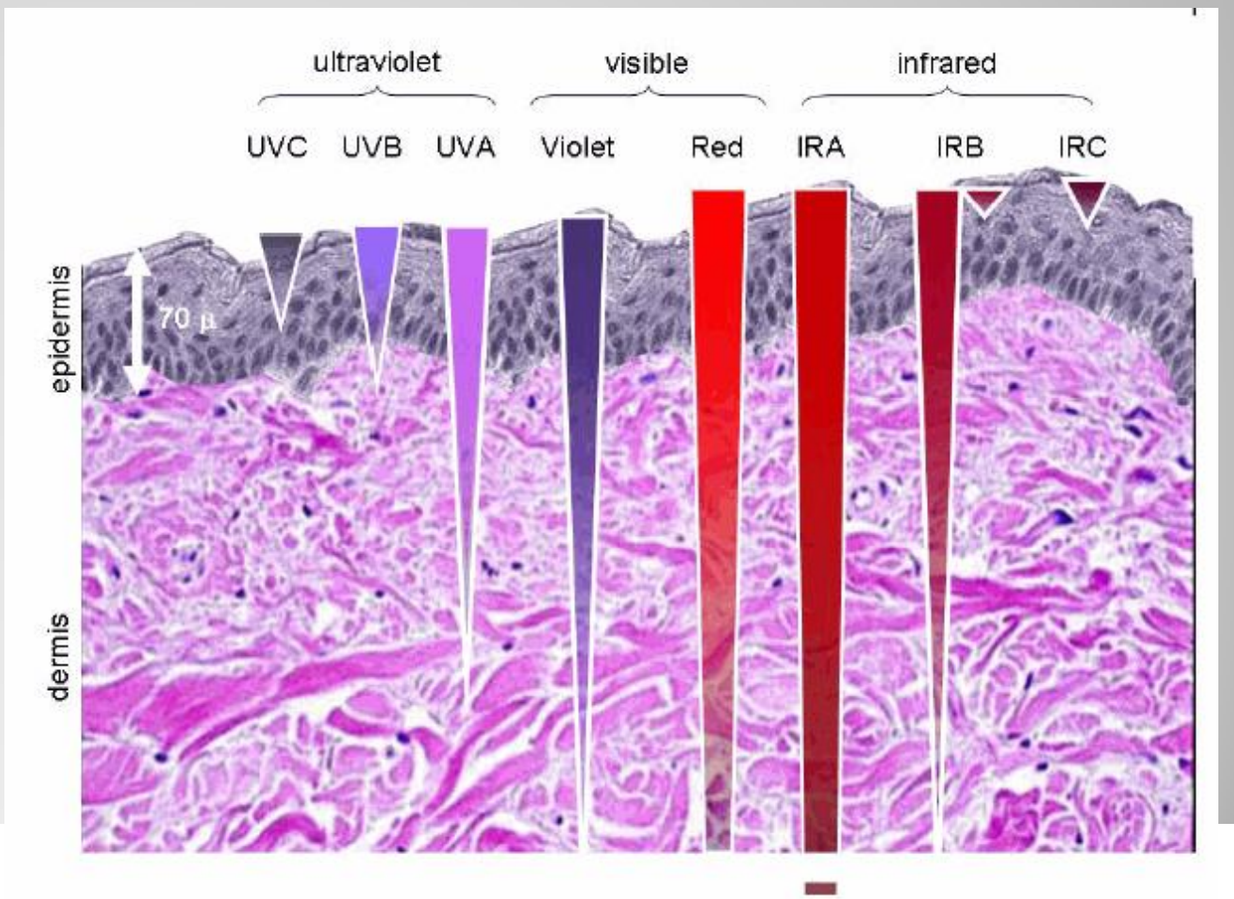
13 papers, all publised between 2012 and 2014

Most recent literature show evidence of
a possible role of led light as an adjunctive therapy (PBS) of periodontal conditions

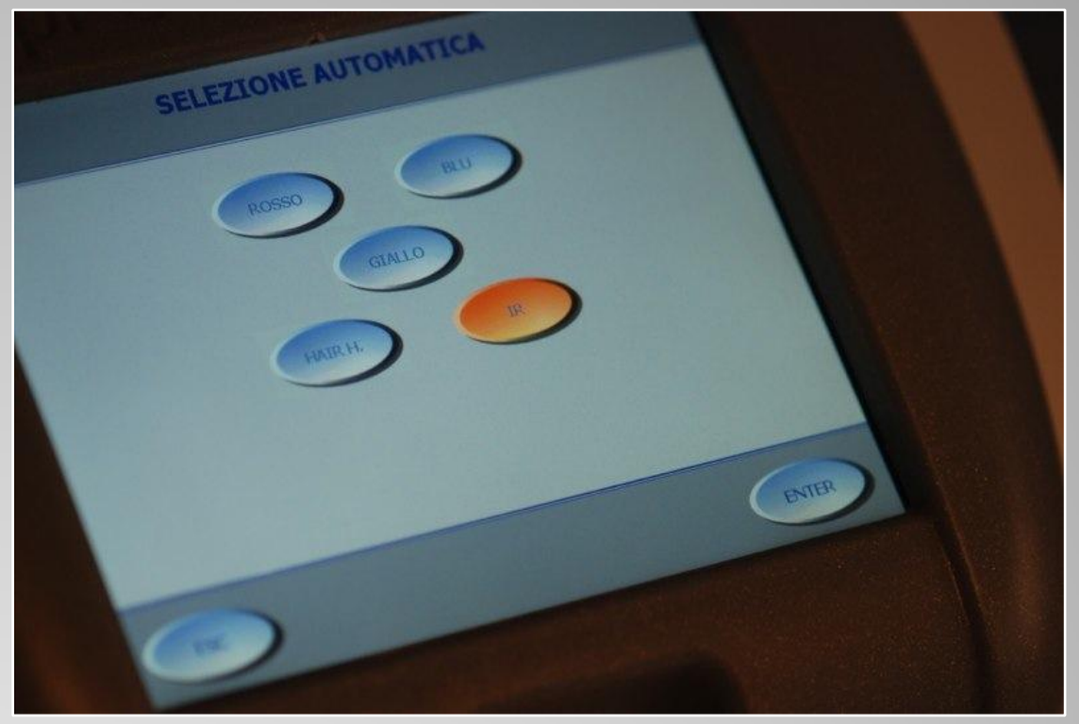
Advantages of the use of an extraoral infrared light source as a photobiostimulatory adjuvant therapy for periodontal diseases

1) Higher the wavelength, greater the depth of penetration of the light:
infrared led light has a capability to penetrate deeper than red light in oral tissues.





2) The extraoral application allows a cleaner technique and a simpler disinfection of the device than an intraoral one.



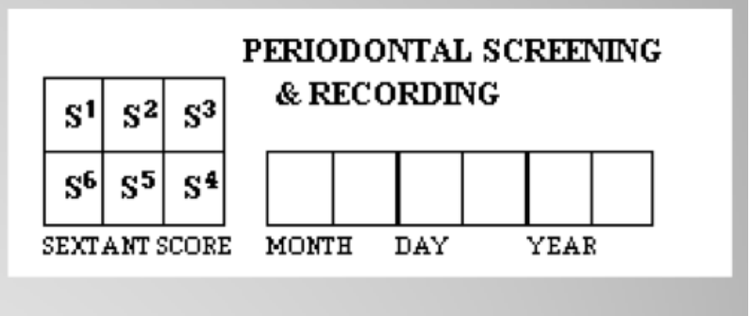
This preliminary study intends to evaluate the photobiostimulatory (PBS) effect of an 835 nm infrared light-emitting diode (**E-Light D® _ Espansione Group, Bologna, Italy**) administered extraorally according to a specific protocol as an adjunctive therapy in chronic periodontitis.

Methods

Protocol for the use of an IR red light device (**E-light D® _Espansione Group, Bologna, Italy**) as an adjuvant therapy in chronic periodontal diseases

PRS scoring pre and post treatment

- Code 0: gingival health
- Code 1: gingivitis
- Code 2: presence of factors that worsen the capability of mantaining a correct dental hygiene
- Code 3 e 4: suspected periodontitis



10 chronic periodontal patients **PRS scoring = 3 in at least 1 sextant**

- 5 treated with standard mechanical treatment (US plus full mouth scaling)
- 5 treated with standard mechanical treatment (US plus full mouth scaling) and IR acccording to the following protocol (in green)

Methods

Protocol for the use of an IR red light device (**E-light D® _Espansione Group, Bologna, Italy**) as an adjuvant therapy in chronic periodontal diseases

PSR 0 : prevention light protocol
- 2 E-Light D® sessions of 20', each 10 days

PSR 1: prevention medium protocol
- 3 E-Light D® sessions of 20', each 10 days, the first one after the US seance

PSR 2: prevention intensive protocol
- 4 E-Light D® sessions of 20', the first one after the US seance, the other each 10 days during the periodontal therapies

PSR 3 to 4: adjuvant protocol to
- Mechanical non surgical therapy (US + FS)
- Pharmacological therapy
- Surgical therapy

- 6 E-Light D® sessions of 20', each 7 days, the first one after the US seance during the periodontal therapies

Results

- All the patients recovered well; the group who underwent the **E-light D® (Espansione Group, Bologna, Italy)** procedure, reported less pain and discomfort when compared with the US/SRP only group.

- After the last session, the PSR was reduced to an average of 1,8 in the US/SRP group and to an average of 1 .0 in the US/SRP + E-light D procedure

Discussion

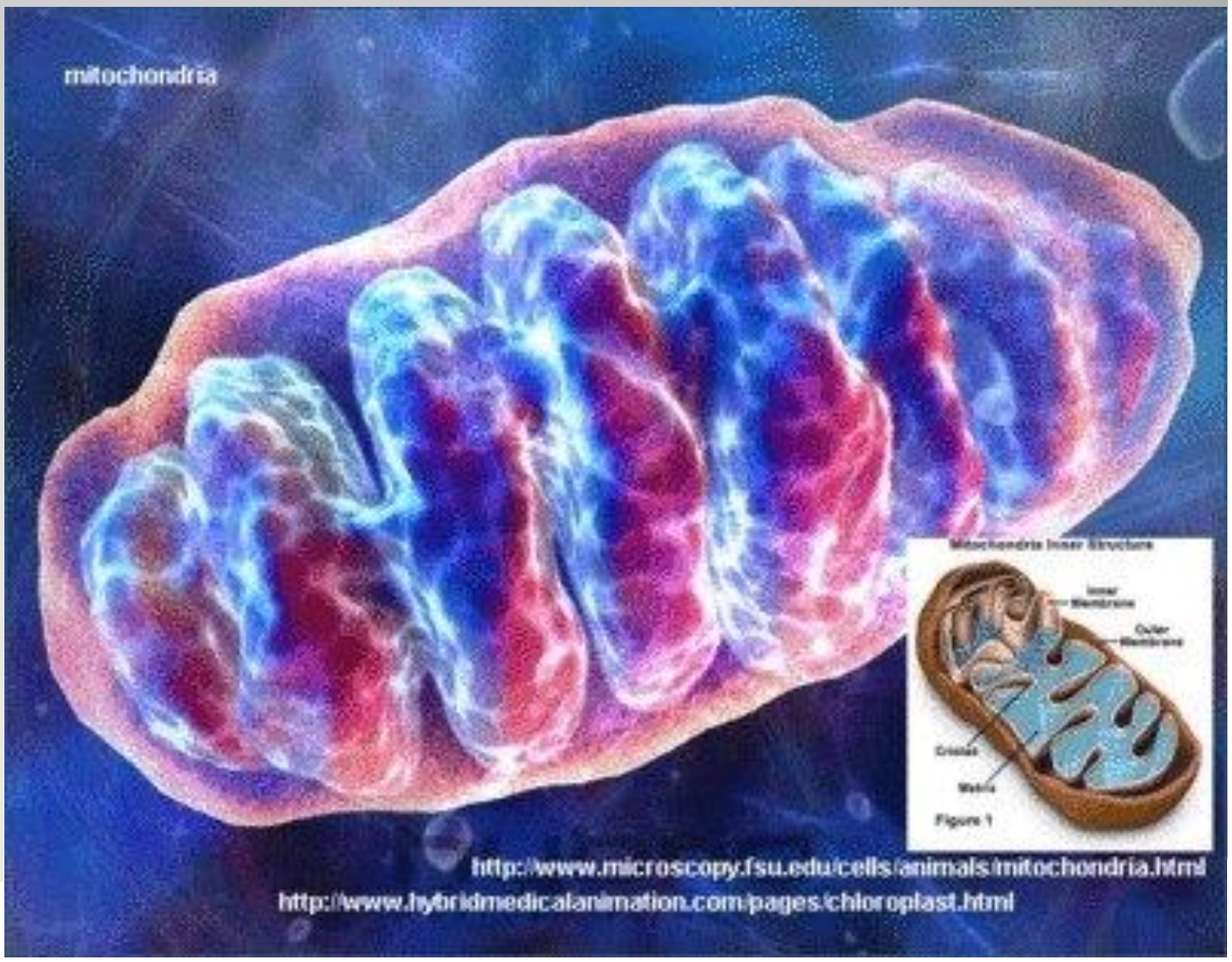
Suggested mechanisms of IR phototherapy

- By damaging pathogenic germs involved with the periodontal disease directely or through photosensitization of disinfectant substances (photodynamic therapy)
- By decreasing bone loss at furcations sites
- By increasing fibroblasts metabolism

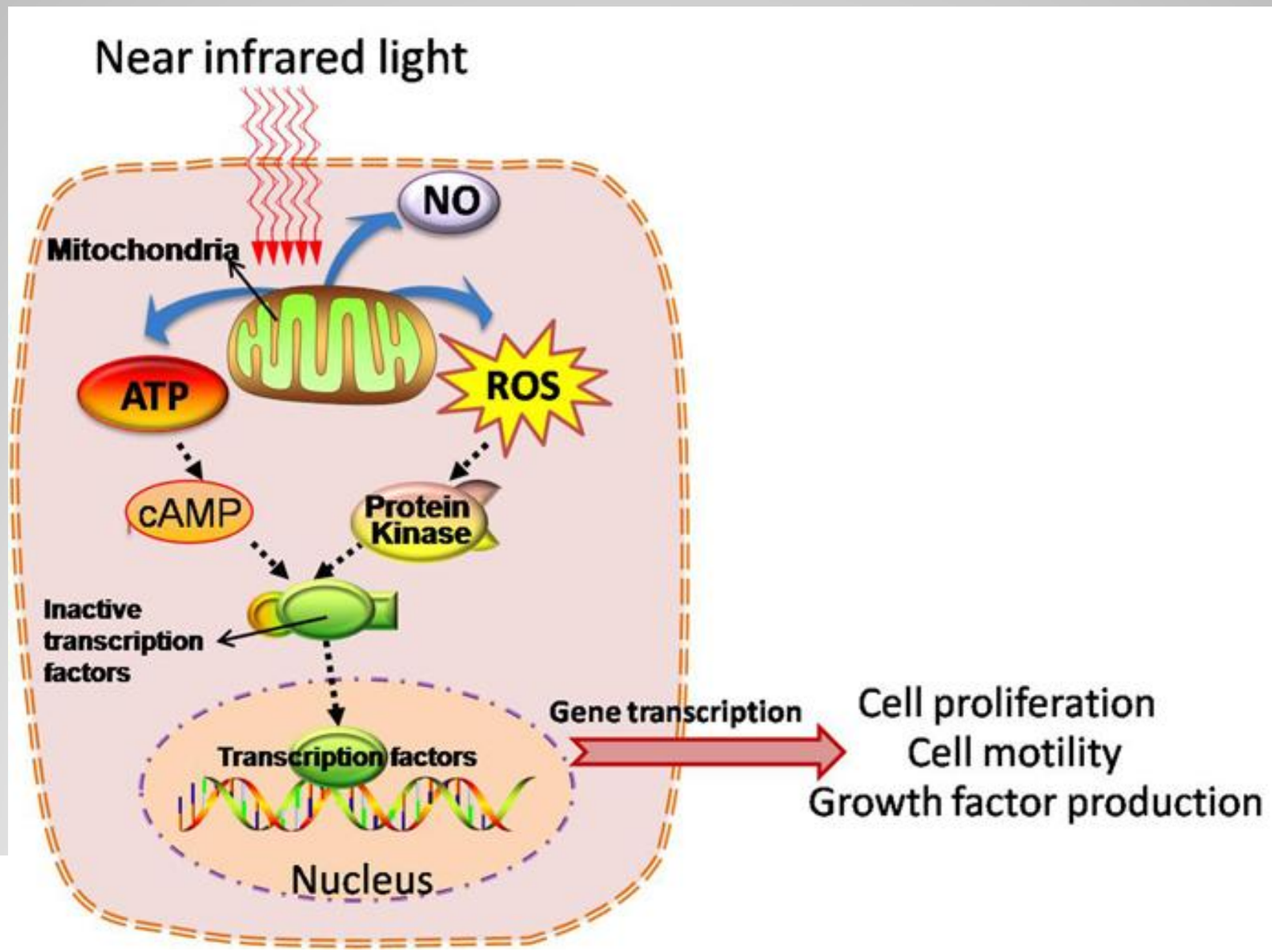
Perspective indications of IR phototherapy

- Prevention of gengivitis progression to a periodontitis as an adjuvant therapy in sinergy with conventional treatments
- Management of a periodontitis as an adjuvant therapy in sinergy with conventional treatments
- Non surgical treatment of advanced periodontitis when antibiotics failed or cannot be used (immunodepression)

- Near IR led **E-light D® (Espansione Group, Bologna, Italy)** light increases periodontal fibroblasts metabolism…



- …by increasing the AMPc production, activation of transcriptional factors, and the consequent activation of genes coding for cell proliferation and growth factors production



Conclusions

- Within the bounds of a preliminary study it can be concluded that the **E-light D® (Espansione Group, Bologna, Italy)**treatment is a promising adjunctive procedure for the treatment of chronic periodontal disease.

- It presents some advantages:

  - **E-light D® (Espansione Group, Bologna, Italy)** can be easily implemented in the conventional therapeutical protocols and may improve their treatment outcome.
  - **E-light D® (Espansione Group, Bologna, Italy)** can be a useful tool for those refractory cases who cannot undergo an antibiotic therapy
  - **E-light D® (Espansione Group, Bologna, Italy)** can be a useful tool in preventing the gengivitis progression to a periodontitis as an adjuvant therapy in sinergy with conventional treatments

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