



Vitamin D Metabolites Protect Against Skin Cancer & Photoaging: A Strategy to Improve Sun Protection Behaviour

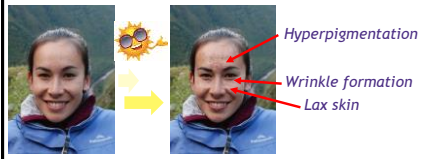
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Introduction



Hyperpigmentation
Wrinkle formation
Lax skin

- Using sun protection to reduce premature aging of the skin may be a powerful strategy to improve sun-protection behaviour and reduce skin cancer risk in young people.
- It would be helpful to know if compounds previously identified as photoprotective against skin cancer also reduce photoaging, including development of hyperpigmentation, wrinkles and lax skin.
- Vitamin D metabolites, 1,25(OH)₂D₃ and 20(OH)D₃ can protect against DNA damage and immune suppression, however, the role of these compounds in protection against photoaging has not yet been determined.

Aim

Can vitamin D metabolites protect against photoaging, as well as skin cancer?

Method

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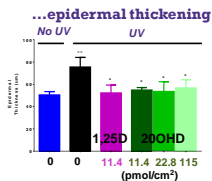
    graph TD
      A[Irradiate Skh:hr1 mice (1 MED) 5 days/wk for 10 wks] --> B[Treat topically with vehicle or 1,25D, or 20D after each UV irradiation]
      B --> C[Dorsal skin removed after 40 weeks and probed for markers]
      C --> D[Matrix Metalloproteinase-3, Haematoxilin and Eosin, Aldehyde Fuchsin]
  
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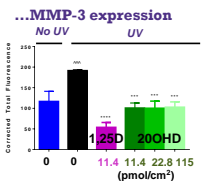
Results

1,25D and 20D inhibit UV-induced...

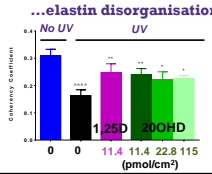
...epidermal thickening



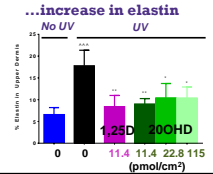
...MMP-3 expression

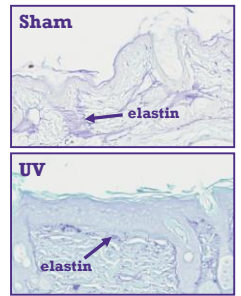


...elastin disorganisation



...increase in elastin





Sham
UV

elastin
elastin

Photomicrographs of elastin stained by aldehyde fuchsin

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Conclusions

- 1,25D and 20D protect against known markers of photoaging.
- This correlates with ability of the same compounds to protect against DNA damage and immune suppression.

Topical vitamin D compounds may be used as an adjunct strategy to protect against both photoaging and skin cancer, especially in young people who may respond well to appearance-based intervention.

- Future studies focused on formulating vitamin D metabolites and vitamin D-like compounds into sunscreens for enhanced photoprotection

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