2010-243 Application of Topical Resveratrol in the Treatment of Acne

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Technology description

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SUMMARY

Researchers in UCLA Department of Dermatology have demonstrated through in vitro experiments that resveratrol, an ingredient in antioxidants and anti-aging products, generates sustained bactericidal and anti-inflammatory effects against P. acnes, the bacteria involved in the pathogenesis of acne.

BACKGROUND

Acne is estimated to affect 45 million individuals in the US alone, representing some 14% of the population. It is an economically burdensome skin disease that costs Americans $3 billion per year. Retinoids, antibiotics, and benzoyl peroxide are the major classes of prescription drugs used in treating acne. Despite their widespread use, those acne regimens have unpleasant side effects such as skin irritation, dryness, and redness, which can reduce patient compliance. Combination therapies to target multiple pathogenic mechanisms are standard. However, their efficacy has been limited since, to date, they can only address up to two of the pathogenesis factors. Therefore, in spite of the large number of products in the market, acne remains one of the most prevalent skin diseases in the world, revealing the need for more innovative and effective acne therapeutics.

Resveratrol is a polyphenol found in red wine, colored berries, and non-edible parts of the peanut plant. It has been shown to have antioxidant, anti-inflammatory, antimicrobial, antineoplastic, and wound healing qualities. However, there have been little to no serious studies evaluating its application in the treatment of acne. It is possible that resveratrol could mitigate or counter some of the effects of P. acnes pathogenesis.

INNOVATION

Researchers in UCLA Department of Dermatology have demonstrated through in vitro experiments that resveratrol, an ingredient in antioxidants and anti-aging therapeutics, generates sustained bactericidal and anti-inflammatory effects against P. acnes, the bacteria involved in the pathogenesis of acne. They found that benzoyl peroxide, an antimicrobial that increases skin turnover and kills bacteria, provides effective short-term elimination of P. acnes in the first 2 days of incubation, and that resveratrol provides a sustained bactericidal effect lasting longer than 3 days. The combination of the two has an additive effect on bactericidal potency, suggesting a combination therapy of resveratrol and benzoyl peroxide could substantially decrease inflammatory markers induced by P. acnes.

Besides its antimicrobial properties, resveratrol also shows anti-inflammatory qualities in cytokine assays, where low concentrations of resveratrol from 5-20 ug/ml decrease IL-12 production. Moreover, concentrations of resveratrol from 10-100 ug/ml decrease production of matrix metalloproteinase, MMP-1 and MMP-9, enzymes that are implicated in inflammatory response and scar formation. Altogether, these in vitro studies demonstrate that resveratrol counters several major areas of acne pathogenesis: overgrowth of bacteria, skin inflammation, and acne-induced scar formation. These benefits substantiate resveratrol’ s potential for creating an entirely novel class of acne therapeutics.

Application area

Treatment of acne by formulating resveratrol with benzoyl peroxide in over-the-counter cleansers in the form of:
- Lotion
- Cream
- Foam or gel to wash face, chest or back

Advantages

- The combination of resveratrol and benzoyl peroxide shows more bactericidal effect toward P. acnes than either compound alone, and could achieve enhanced efficacy at lower therapeutic doses
- Both benzoyl peroxide and resveratrol already exist in over-the-counter forms and have been demonstrated to be safe and well tolerated in human studies
- Resveratrol has anti-androgenic, anti-inflammatory, and antibacterial properties that targets three of the four major pathogenic factors in acne formation
- Status of resveratrol as an all-natural product can facilitate marketing

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