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바쿠치올

CLINICAL TRIAL

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Prospective, randomized, double-blind assessment of topical bakuchiol and retinol for facial photoageing

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Summary

Background Bakuchiol is a phytochemical that has demonstrated cutaneous antiageing effects when applied topically. Early studies have suggested that bakuchiol is a functional analogue of topical retinoids, as both compounds have been shown to induce similar gene expression in the skin and lead to improvement of cutaneous photodamage. No *in vivo* studies have compared the two compounds for efficacy and side-effects.

Objectives To compare the clinical efficacy and side-effect profiles of bakuchiol and retinol in improving common signs of cutaneous facial ageing.

Methods This was a randomized, double-blind, 12-week study in which 44 patients were asked to apply either bakuchiol 0.5% cream twice daily or retinol 0.5% cream daily. A facial photograph and analytical system was used to obtain and analyse high-resolution photographs of patients at 0, 4, 8 and 12 weeks. Patients also completed tolerability assessment questions to review side-effects. During study visits, a board-certified dermatologist, blinded to study group assignments, graded pigmentation and redness.

Results Bakuchiol and retinol both significantly decreased wrinkle surface area and hyperpigmentation, with no statistical difference between the compounds. The retinol users reported more facial skin scaling and stinging.

Conclusions Our study demonstrates that bakuchiol is comparable with retinol in its ability to improve photoageing and is better tolerated than retinol. Bakuchiol is promising as a more tolerable alternative to retinol.

The **bakuchiol** used in this study was isolated from edible seeds of *P. corylifolia*, a psoralene-depleted bakuchiol {INCI name: bakuchiol; chemical name: phenol, 4-[(1E,3S)-3-ethenyl-3,7-dimethyl-1,6-octadienyl], optically active} with a purity of over 99%. The topical retinol was formulated in the same vehicle as the bakuchiol (Sytheon Ltd, Boonton, NJ, U.S.A.).

레티놀과 바쿠치올 성분의 임상 효능 비교와 부작용 비교 연구

캘리포니아 대학의 Davis 피부과 전문의가 수행한 Sytenol A와 Retinol의 더블 블라인드 임상 연구에서 두 화합물 모두 통계적 차이 없이 주름과 과색소침착을 크게 감소시켰으나 레티놀 사용자는 itching, burning, stinging 등의 피부 자극이 더 크다고 보고했다. 연구 결과로 Bakuchiol은 레티놀의 대체성분으로 적합하다고 설명하고 있다.

바쿠치올

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Bakuchiol: a retinol-like functional compound revealed by gene expression profiling and clinically proven to have anti-aging effects

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Synopsis

OBJECTIVE: The study was undertaken to compare the skin care related activities of retinol and bakuchiol, a potential alternative to retinoids. Retinol is a pivotal regulator of differentiation and growth of developing as well as adult skin. Retinoic acid is the major physiologically active metabolite of retinol regulating gene expression through retinoic acid receptor – dependant and independent pathways.

METHODS: Comparative gene expression profiling of both substances in the EpiDerm FT full thickness skin substitute model was undertaken. Furthermore, type I, III and IV collagen, as well as aquaporin 3 expression was analyzed by ELISA and/or histochemistry in human dermal fibroblasts and/or EpiDerm FT skin substitutes.

RESULTS: Bakuchiol is a meroterpene phenol abundant in seeds and leaves of the plant *Psoralea corylifolia*. We present evidence that bakuchiol, having no structural resemblance to retinoids, can function as a functional analogue of retinol. Volcano plots showed great overall similarity of retinol and bakuchiol effects on the gene expression profile. This similarity was confirmed by the side-by-side comparison of the modulation of individual genes, as well as on the protein level by ELISA and histochemistry. Retinol-like functionality was further confirmed for the upregulation of types I and IV collagen in DNA microarray study and also show stimulation of type III collagen in the mature fibroblast model. Bakuchiol was also formulated into a finished skin care product and was tested in clinical case study by twice-a-day facial application. The results showed that, after 12 weeks treatment, significant improvement in lines and wrinkles, pigmentation, elasticity, firmness and overall reduction in photo-damage was observed, without usual retinol therapy-associated undesirable effects.

CONCLUSION: Based on these data, we propose that bakuchiol

métabolite physiologiquement actif du rétinol qui régule l'expression des gènes par des voies dépendantes et indépendantes du récepteur de l'acide rétinoïque.

MÉTHODES: Un profilage comparatif d'expression génétique de ces deux substances dans le modèle substitut de la peau EpiDerm FT a été entrepris. La synthèse des collagènes de type I, III et IV et de l'aquaporine 3 dans des fibroblastes dermiques humains normaux ont été analysés par ELISA et/ou en histochimie dans le modèle de peau EpiDermTM FT.

RÉSULTATS: Bakuchiol est un phénol meroterpène abondant dans les graines et les feuilles de la *Psoralea corylifolia*. Nous présentons des preuves que bakuchiol, n'ayant aucune ressemblance structurale avec les rétinoïdes, peut fonctionner comme un analogue fonctionnel de rétinol. Les diagrammes de type Volcano montrent la grande similitude de l'effet du rétinol et du bakuchiol sur l'expression des gènes. Cette ressemblance a été aussi démontrée par la comparaison de la modulation de l'expression de gènes particuliers, appartenant à de différents groupes fonctionnelles. La fonctionnalité rétinol-like a été confirmée par la régulation à la hausse du collagène de type I et IV et aquaporine 3 au niveau de protéine par ELISA et histochimie. Le bakuchiol a également été formulé dans un produit de soin de la peau et a été testé dans une étude clinique avec deux applications par jour au visage. Les résultats ont montré que, après le traitement de douze semaines, une amélioration significative a été observée dans les rides et ridules, la pigmentation, l'élasticité, la fermeté et la réduction globale de dommages du photo-vieillessement, sans les effets indésirables habituels associés à la thérapie au rétinol.

CONCLUSION: Sur la base de ces données, nous proposons que le bakuchiol peut fonctionner comme un composé anti-vieillessement grâce à la réglementation de l'expression des gènes similaire au rétinol.

A retinol-like functional compound

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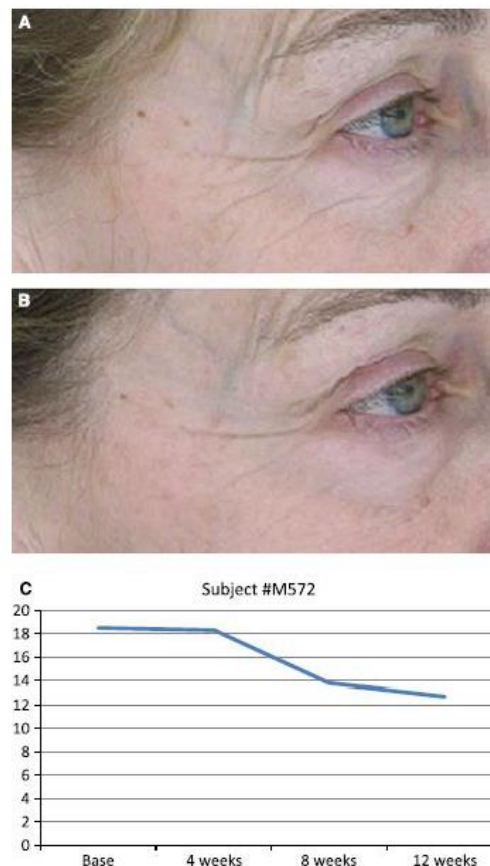


Figure 5 (A) Subject no. M572; Right view; Pre application. (B) Subject no. M572; Right view; 12-week treatment. (C) Change in wrinkle depth in μm.

The photos (Fig. 5; before and after treatment) shown here are representative of the results that have been obtained with bakuchiol treatment for 12 weeks.

Clinical grading and comparative analysis of skin profilometric measurements were performed at baseline and after 4, 8 and 12 weeks of application. After 8 weeks of daily application, a significant reduction in the wrinkle depth and roughness was observed with the product vs. baseline. These changes were even greater after 12 weeks of product application. For example, wrinkle depth reduction (Fig. 5C) is significantly more after 8 weeks compared to 4 weeks of application of bakuchiol (subject no. M572) showing a certain degree of cumulative beneficial effect over time.

The significant improvement in fine lines and wrinkles, elasticity, firmness and overall reduction in signs of photodamage including even toning effects observed after 12 weeks of treatment provided the ultimate validation of the *in vitro* results and were in line with the retinoid-type functionality of bakuchiol.

Conclusion

Given the fact that retinol and bakuchiol do not have close structural similarities, yet they exhibit a similar gene expression profile, especially on certain key anti-ageing genes and proteins, which is remarkable. Bakuchiol has several substantial advantages over retinol, including excellent photochemical and hydrolytic stability a good safety profile and ease to formulate due to miscibility with a wide variety of emollients and solubilizers [18]. Bakuchiol can be used during the day due its photostability. Interestingly, bakuchiol is an excellent stabilizer of retinol under photo-oxidative as well as singlet oxygen environments (not discussed here). This property may help reduce oxidative stress caused by retinol when combined with bakuchiol and used at concentrations higher than the physiological limit [54].

This open clinical pilot study needs further confirmation of bakuchiol bioactivity *in vivo*, from vehicle- or benchmark-controlled studies. The similarity of gene expression and protein synthesis stimulation observed in the comparison of bakuchiol with retinol is, however, remarkable and suggests that similar bioactivity *in vivo* is probable. Taken together, this study demonstrates the potential of bakuchiol, a true retinol-like functional compound, to become a key ingredient for dermatological and skin care products.

비건 펩타이드

[Non animal test 증명서]

Certificate of Non Animal Test

Date : 14-JUN-2021

■ Product Name : PEPTIDESOME-2X

1. Proves that the the ingredients mixed the PEPTIDESOME-2X and raw materials that do not conduct animal tests.

2. If it is confirmed that the animal tests conducted after the Date of this Certification will be notified immediately.

3. Date of this Certification, after securing proof manufacturing raw materials for animal tests not.


The content of this is true.

Signature

Company name : H&A PharmaChem

Position : President

Name : Yu Hyogyoun

Signature 

[오리진 증명서]

Certificate of Product

Date : Apr 7, 2016

■ Customer : Cosmax
■ Product Name : PEPTIDESOME-2X

No	ICID Name	CAS No	Contents(%)	Source of oringin	place of origin
1	Lecithin	8002-43-5	1.00	Plant	Germany
2	Butylene Glycol	107-88-0	4.00	Natural	USA
3	Water	7732-18-5	to 100	Natural	Korea
4	Glycerin	56-81-5	3.00	Plant	Malaysia
5	Polysorbate 20	9005-64-5 (Generic)	1.00	Synthetic	Japan
6	Caprylic/capric Triglyceride	65381-09-1	2.00	Natural	Germany
7	Disodium EDTA	139-33-3	0.01	Synthetic	Korea
8	Copper Tripeptide-1	-	10 ppm	Synthetic	Korea
9	Acetyl Hexapeptide-8	-	5 ppm	Synthetic	Korea
10	Sodium Ascorbyl Phosphate	66170-10-3	0.03	Synthetic	Netherlands
11	1,2-Hexanediol	6920-22-5	2.00	Synthetic	Korea

THANK YOU

