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JDD

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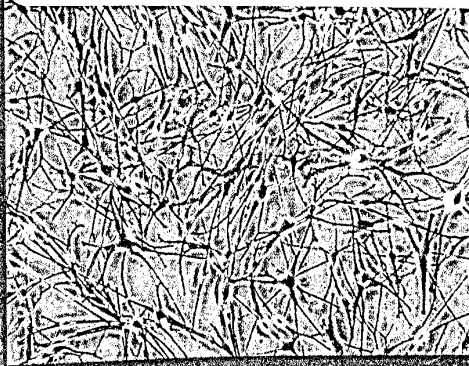
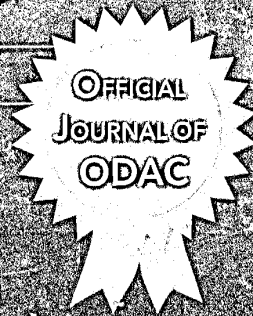


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Anti-Aging Effects of Probiotics

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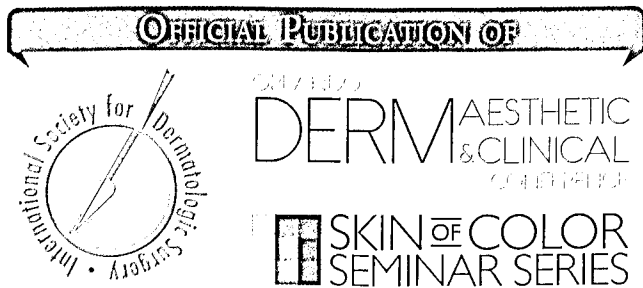
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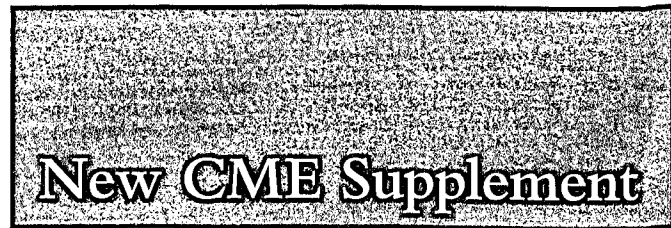
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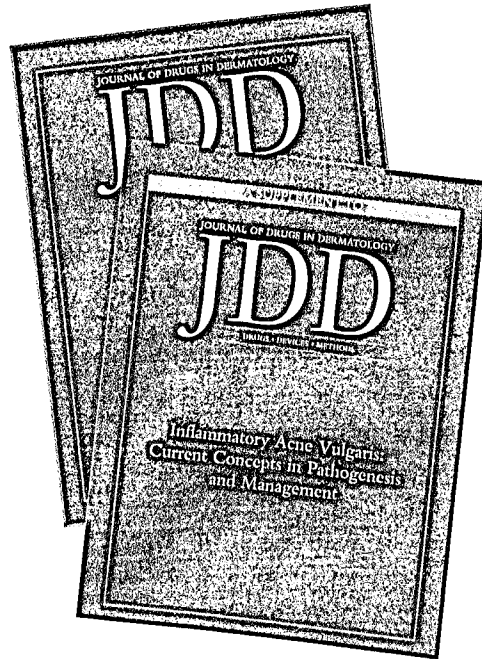
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Leon H. Kircik MD and Joshua A. Zeichner MD



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Evaluation of the Appearance of Nail Polish Following Daily Treatment of Ex Vivo Human Fingernails With Topical Solutions of Tavaborole or Efinaconazole

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ABSTRACT

Introduction: Patients with onychomycosis may mask infected nails with polish. Tavaborole topical solution, 5% is a boron-based, small-molecule pharmaceutical approved for the treatment of toenail onychomycosis caused by *Trichophyton rubrum* and *Trichophyton mentagrophytes*; efinaconazole topical solution, 10% is approved for the same indication. Nail polish appearance after application of tavaborole (dropper) or efinaconazole (brush); respective applicator appearance; presence of color transfer from respective applicators; and color transfer to remaining solutions after dosing of polished nails were evaluated.

Methods: Twelve ex vivo human cadaver fingernails were cleaned, polished with two coats of L'Oréal® Nail Color, Devil Wears Red #420, and mounted on floral foam. Nails were treated with tavaborole or efinaconazole solutions once daily for 7 days. Dropper and brush applicators were applied to white watercolor paper immediately after dosing to evaluate color transfer from polished nails. On day 7, remaining solutions were transferred to clear glass vials to evaluate color transfer from applicators to solutions. Nails, applicators, and papers were photographed daily following application; remaining solutions were photographed after 7 days of dosing.

Results: Tavaborole-treated polished nails showed no polish discoloration, and tavaborole applicators did not change in appearance during treatment. No color transfer from polished nails was evident to applicator, paper, or remaining solution. Efinaconazole-treated polished nails showed substantial polish changes after the first day of treatment, with polish appearance and discoloration progressively worsening over 7 days of treatment. Color transfer from nails was evident to applicator, paper, and remaining solution.

Conclusions: Daily dropper application of tavaborole to ex vivo polished nails did not alter polish appearance. Brush application of efinaconazole produced visible changes in polish appearance and color transfer to applicators, paper, and remaining solution. Tavaborole topical solution, 5% may not alter nail polish appearance; the impact of nail polish on tavaborole clinical efficacy has not been evaluated.

J Drugs Dermatol. 2016;15(1):89-94.

INTRODUCTION

Onychomycosis is a common fungal infection of the nail unit that can cause subungual hyperkeratosis, thickening and discoloration of the nail, and onycholysis.^{1,2} The unsightly appearance of the diseased nail can cause social embarrassment and negatively impact patient self-image.^{3,4} Even with successful treatment, complete regrowth of healthy toenails can take up to 18 months.⁴ During this time, patients may choose to mask discolored infected nails with polish; thus, the compatibility of nail polish with topical antifungal treatments is an important consideration for many patients with onychomycosis.

Treatment of onychomycosis is challenging due to the inability of some drugs to effectively penetrate the nail and reach fungal pathogens located beneath the nail plate.⁵ Until recently, the only US Food and Drug Administration (FDA)-approved topical treatment for onychomycosis was ciclopirox nail lacquer,

antifungals for the treatment of onychomycosis of the toenails caused by *Trichophyton rubrum* or *Trichophyton mentagrophytes*, including Kerydin® (tavaborole topical solution, 5%; Anacor Pharmaceuticals, Inc., Palo Alto, CA), a boron-based small-molecule pharmaceutical,⁷ and Jublia™ (efinaconazole topical solution, 10%; Valeant Pharmaceuticals, LLC, Bridgewater, NJ).⁸

Findings from in vitro studies have established the effective penetration of tavaborole through full-thickness human nail plates to the nail bed, where the fungal infection resides.^{9,10} Importantly, tavaborole has been shown to retain its pharmacologic antifungal activity in the presence of keratin after permeating the nail plate. Similarly, nail-penetration studies in patients with toenail onychomycosis have shown the ability of efinaconazole to penetrate the subungual space between the nail plate and nail bed.¹¹ In addition, in vitro permeation studies

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