植化素抑制白色念珠菌感染陰道上皮細胞毒力因子之功效

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4 大綱

5 一、前言

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- 6 二、真菌群體感應分子法尼醇調節陰道上皮細胞對白色念珠菌的免疫反應
- 7 三、甘草查耳酮 A 保護陰道上皮細胞免受白色念珠菌感染
- 8 四、槲皮素對白色念珠菌浮游細胞和生物膜細胞的體外試驗結果
- 9 五、結論

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10 摘要

11 外陰陰道念珠菌病 (Vulvovaginal candidiasis, VVC) 是一種影響全球女性的常

12 見病症,藥物治療常伴隨復發,因此部分患者轉向植化素療法。法尼醇 (Farnesol)

13 能自多種植物中取得,具有刺激巨噬細胞遷移、抑制菌絲形成及生物膜的能力;

14 甘草查耳酮 A(Licochalcone A, LA) 可自甘草根中取得,對多種微生物具有抑制作

15 用;槲皮素 (Quercetin, QC) 廣泛存在於植物中,因其治療副作用小而受到重視。

16 本報告旨在利用陰道上皮細胞 VK2/E6E7 進行實驗,評估法尼醇、LA 和 QC 對白

色念珠菌感染與對陰道上皮之影響。採用 XTT 還原試驗、LDH 測定、ELISA 和西

方墨點法等技術,分析細胞的形態、存活率、黏附性及炎症反應。法尼醇在低於

19 50 μmol/L 的濃度下,對 VK2 細胞的形態和存活率無影響,但能顯著降低白色念

20 珠菌黏附。LA 劑量依賴性地抑制生物膜形成及細胞黏附,並減輕細胞損傷和發炎

21 反應,顯示其對 TLR4/NF-κB 信號路徑的抑制作用。QC 16 μM 的濃度能有效抑制

22 其生物膜形成,並保護陰道黏膜完整性。3 種植化素皆展示出對 VVC 的治療效果,

23 法尼醇促進免疫反應、LA 增強細胞抵抗力,而 QC 則能抑制感染和發炎,可為

24 VVC 提供另一種治療方案。

Inhibitory effect of Phytochemicals on Virulence Factors of Candida

2	albicans	Infection	in	Vaginal	Epithelial	Cells

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5 Outline

- 6 1. Introduction
- 7 2. The fungal quorum-sensing molecule, farnesol, regulates the immune response of vaginal epithelial cells against *Candida albicans*
- 9 3. Licochalcone A protects vaginal epithelial cells against *Candida albicans* infection
- 10 4. In vitro outcomes of quercetin on Candida albicans planktonic and biofilm cells
- 11 5. Conclusion

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12 Abstract

Vulvovaginal candidiasis (VVC) is a common condition affecting women globally, often accompanied by recurrent episodes after treatment, leading some patients to turn to phytochemical therapies. Farnesol, derived from various plants, stimulates macrophage migration and inhibits hyphal formation and biofilm development. Licochalcone A (LA), extracted from licorice roots, has antimicrobial effects against various microorganisms. Quercetin (QC), widely found in plants, has gained attention for its minimal side effects. This report aims to evaluate the effects of farnesol, LA, and QC on Candida albicans infections and vaginal epithelium using VK2/E6E7 cells. Techniques such as XTT reduction assay, LDH measurement, ELISA, and western blot were employed to analyze cell morphology, viability, adhesion, and inflammatory responses. Farnesol, at concentrations below 50 µmol/L, did not affect VK2 cell morphology or viability but significantly reduced C. albicans adhesion. LA dose-dependently inhibited biofilm formation and cell adhesion, alleviated cell damage and inflammation, demonstrating its inhibitory effect on the TLR4/NF-κB signaling pathway. QC, at a concentration of 16 μM, effectively inhibited biofilm formation and reduced inflammation, and protected vaginal mucosal integrity. All three phytochemicals exhibited therapeutic potential for VVC: farnesol enhanced immune response, LA strengthened cell resistance, and QC inhibited infection and inflammation, providing an alternative treatment option for VVC.

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