Claims

1. A method for preparing a ~~polyene macrolide~~ nystatin antifungal with improved aqueous solubility, the method comprising

providing a nystatin, the nystatin ~~polyene macrolide antifungal~~ having a carboxylic acid group;

activating the carboxylic acid group;

introducing a primary amine to the activated polyene macrolide antifungal;

reacting for a time sufficient to convert the carboxylic acid to an amide, and

quenching the reaction, wherein the resulting product is a polyene macrolide salt, wherein the salt includes a counterion selected from the group consisting of acetate, formate, propionate, butyrate, chloride and sulfate.

~~2. The method of claim 1 wherein the polyene macrolide antifungal is selected from the group consisting of nystatin, amphotericin, candicidin, natamycin, polyfungin, and Levorin.~~

~~3. The method of claim 2 wherein the polyene macrolide antifungal is nystatin.~~

~~4.~~2. The method of claim 1 wherein the carboxylic acid group is activated with a coupling reagent.

~~5.~~3. The method of claim ~~4~~2 wherein the coupling reagent comprises O-(1H-6-chlorobenzotriazole-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HCTU).

~~6.~~4. The method of claim 1 wherein the primary amine is selected from the group consisting of optionally substituted C_1-C_{10} alkylamine, optionally substituted C_1-C_{10} alcoholamine, amino acids, and hydroxylamine, wherein the optional substituent, if present, is selected from the group consisting of alcohols, amines, carboxylic acids and combinations thereof.

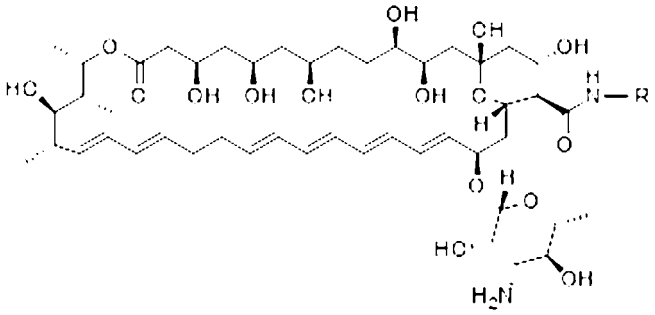
7.5.The method of claim 64, wherein the primary amine is selected from the group consisting of ethanolamine, lysine, hydroxylamine, leucenol, methylamine, ethylamine, propylamine, butylamine, and combinations thereof.

8.6.The method of claim 75 wherein the primary amine is selected from the group consisting of ethanolamine, lysine, hydroxylamine and leucenol.

9.7.The method of claim 86 wherein the primary amine is ethanolamine.

10.8. The method of claim 1 further comprising the step of separating the resulting polyene macrolide amide salt to provide an isolated polyene macrolide amide salt.

11.9. A compound of Formula I



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wherein R is a selected from the group consisting of C_1-C_{10} alkyl, C_1-C_{10} substituted alkyl, C_1-C_{10} alcohol, C_1-C_{10} substituted alcohol, and hydroxyl, wherein the substituents are selected from the group consisting of alcohols, amines, carboxylic acids and combinations thereof,

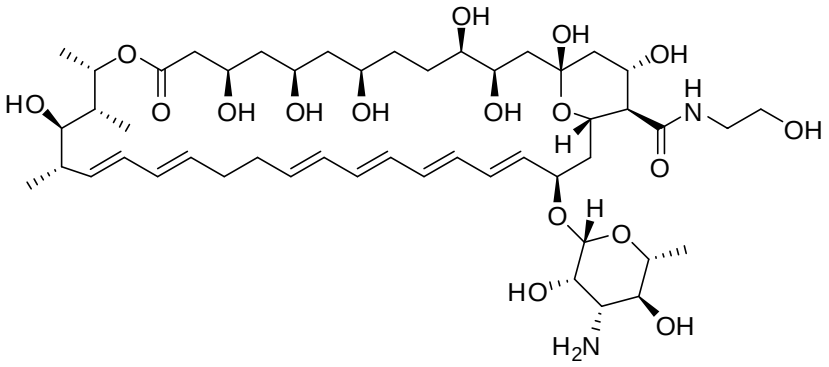
or a salt thereof.

12.10. The compound of claim 119, wherein R is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 substituted alkyl, C_1-C_6 alcohol, C_1-C_6 substituted alcohol or a combination thereof.

13.11. The compound of claim 1210 wherein R is ethanol.

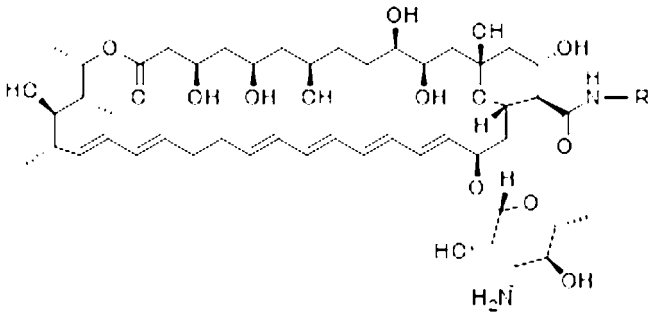
~~14.~~12. The compound of claim ~~11~~9 wherein the compound of Formula I comprises a salt, wherein the counterion is selected from the group consisting of salt includes a counterion selected from the group consisting of acetate, formate, propionate, butyrate, chloride and sulfate.

~~15.~~13. Nystatin ethanol amide having the structure:



or a salt thereof.

~~16~~14. A composition for use in the treatment of a fungal infection in a subject, the composition comprising a compound of Formula I



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wherein R is a selected from the group consisting of C_1-C_{10} alkyl, C_1-C_{10} substituted alkyl, C_1-C_{10} alcohol, C_1-C_{10} substituted alcohol, and hydroxyl, wherein the substituents are selected from the group consisting of alcohols, amines, carboxylic acids and combinations thereof,

or a salt thereof.

~~17~~15. The composition of claim ~~16~~14, wherein the fungal infection is associated with *Candida* or *Asperigillus*.