CLAIMS

The invention claimed is:

1. A composition prepared for topical administration to deliver donepezil intradermally, comprising (i) donepezil or a pharmaceutically acceptable salt thereof, (ii) 2-(2ethoxyethoxy)ethan-1-ol, (iii) a fatty acid ester, and (iv) a monohydric alcohol,

2. The composition of claim 1, further comprising (v) at least one low molecular weight polyethylene glycol.

3. The composition of claim 2, comprising at least two ~~monohyrdric~~ monohydric alcohols.

4. The composition of claim 2, comprising at least two glycols from the group consisting of: di-, oligo- or poly-ethylene glycols that have at least one terminal alkoxy group in place of a terminal hydroxyl group.

5. The composition of claim 2, wherein the composition delivers an intradermal concentration of donepezil relative to the amount of donepezil provided transdermally that is at least twice that provided by a composition of donepezil in a solvent.

6. The composition of claim 2, wherein the composition comprises donepezil, ethanol, at least two PEG selected from the group consisting of: PEG 400, PEG1450, and PEG600, 2-(2ethoxyethoxy)ethan-1-ol, and isopropyl palmitate.

7. The composition of claim 6, further comprising hydroxypropyl cellulose in amount of 3%.

8. The composition of claim 6, wherein donepezil present in an amount between 0.5%-1.5% (wt/wt), ethanol in an amount between 30%-40%, PEG 400 in an amount between 16%- 26%, one of either PEG1450 or PEG 600 in an amount of 5%, 2-(2-

ethoxyethoxy)ethan-1-ol in an amount between 20%-30%, and isopropyl palmitate in an amount of 5%.

9. The composition of claim 6, wherein donepezil is present in an amount of 1% (wt/wt), ethanol in an amount of 40%, PEG 400 in an amount of 16%, PEG 600 in an amount of 5%, 2(2-ethoxyethoxy)ethan-1-ol in an amount of 30%, and isopropyl palmitate in an amount of 5%.

10. The composition of claim 6, wherein donepezil is present in an amount of 1% (wt/wt), ethanol in an amount of 40%, PEG 400 in an amount of 26%, PEG 600 in an amount of 5%, 2(2-ethoxyethoxy)ethan-1-ol in an amount of 20%, and isopropyl palmitate in an amount of 5%.

11. The composition of claim 2, wherein the composition comprises donepezil HCl, water, cetyl alcohol, at least two PEG selected from the group consisting of: PEG 400, PEG1450, and PEG600, 2-(2-ethoxyethoxy)ethan-1-ol, a mixture of caprylic and capric (C10) triglyceride, isopropyl myristate, and isopropyl palmitate.

12. The composition of claim 11, further comprising propylene glycol in an amount of 7%.

13. The composition of claim 11 wherein the donepezil HCl is present in an amount of 1% (wt/wt), water in amount of 40.3%, cetyl alcohol in an amount of 10%, isopropyl myristate in an amount of 10%, a mixture of caprylic and capric (C10) triglyceride in an amount of 10%, and isopropyl palmitate in an amount of 7%.

14. The composition of claim 11, wherein the donepezil HCl is present in an amount 1% (wt/wt), water in an amount of 56.9%, cetyl alcohol in an amount of 3%, a mixed caprylic and capric (C10) triglyceride in amount of 5%, and isopropyl palmitate in amount of 7%.

15. A method of treating plaque psoriasis (psoriasis vulgaris) in a mammal in need thereof, the method comprising topically administering to a psoriasis plaque on the mammal the composition of claim 5, wherein (1) the composition is in a form selected

from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil is 0.05% to 2% by weight of the composition.

16. A method of treating plaque psoriasis (psoriasis vulgaris) in a mammal in need thereof, the method comprising topically administering to a psoriasis plaque on the mammal the composition of claim 10, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil HCI is 0.05% to 2% by weight of the composition.

17. The method of claim 15, wherein the composition is topically administered to the psoriasis plaque twice daily for a duration of two to six weeks.

18. The method of claim 16, wherein the composition is topically administered to the psoriasis plaque twice daily for a duration of two to six weeks.

19. A method of treating atopic dermatitis in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim 5, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil is 0.05% to 2% by weight of the composition.

20. A method of treating atopic dermatitis in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim 10, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil HCl is 0.05% to 2% by weight of the composition.

21. A method of treating acne in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim 5, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil is 0.05% to 2% by weight of the composition.

22. A method of treating acne in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim 10, wherein

(1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil HCI is 0.05% to 2% by weight of the composition.

23. A composition prepared for topical administration to deliver donepezil intradermally, comprising (i) donepezil or a pharmaceutically acceptable salt thereof, (ii) 2-(2ethoxyethoxy)ethan-1-ol, (iii) a fatty acid ester, and (iv) a monohydric alcohol.

~~24. The composition of claim 23, comprising at least two monohyrdric alcohols.~~

~~25.~~24. The composition of claim 23, comprising at least two glycols from the group consisting of: di-, oligo- or poly-ethylene glycols that have at least one terminal alkoxy group in place of a terminal hydroxyl group.

~~26.~~25. The composition of claim 23, wherein the composition delivers an intradermal concentration of donepezil relative to the amount of donepezil provided transdermally that is at least twice that provided by a composition of donepezil in a solvent.

~~27.~~26. The composition of claim 23, wherein the composition comprises donepezil, ethanol, 2(2-ethoxyethoxy)ethan-1-ol, and isopropyl palmitate.

~~28.~~27. The composition of claim ~~26~~27, further comprising hydroxypropyl cellulose in amount of 3%.

~~29. The composition of claim 27, wherein donepezil present in an amount between 0.5%-1.5% (wt/wt), ethanol in an amount between 30%-40%, 2-(2-ethoxyethoxy)ethan-1-ol in an amount between 20%-30%, and isopropyl palmitate in an amount of 5%.~~

~~30.~~28. The composition of claim ~~26~~27, wherein donepezil is present in an amount of 1% (wt./wt), ethanol in an amount of 40%, 2(2-ethoxyethoxy)ethan-1-ol in an amount of 30%, and isopropyl palmitate in an amount of 5%.

~~31. The composition of claim 27, wherein donepezil is present in an amount of 1% (wt/wt), ethanol in an amount of 40%, 2(2-ethoxyethoxy)ethan-1-ol in an amount of 20%, and isopropyl palmitate in an amount of 5%.~~

~~32.~~29. The composition of claim 23, wherein the composition comprises donepezil HCl, water, cetyl alcohol, 2-(2-ethoxyethoxy)ethan-1-ol, a mixture of caprylic and capric (C10) triglyceride, and isopropyl palmitate.

~~33.~~30. The composition of claim 29~~32~~, further comprising propylene glycol in an amount of 7%.

~~34.~~31. The composition of claim ~~-~~29~~32~~, wherein the donepezil HCl is present in an amount of 1% wt/wt), water in amount of 48.9%, cetyl alcohol in an amount of 11%, a mixture of caprylic and capric (C10) triglyceride in an amount of 5%, and isopropyl palmitate in an amount of 7%.

~~35.~~32. The composition of claim 29~~32~~ wherein the donepezil HCl is present in an amount of 1% (wt/wt), water in amount of 51% cetyl alcohol in an amount of 9%, a mixture of caprylic and capric (C10) triglyceride in an amount of 5%, and isopropyl palmitate in an amount of 7%.

~~36.~~33. The composition of claim ~~-~~29~~32~~, wherein the donepezil HCl is present in an amount of 1% (wt/wt), water in amount of 49%, cetyl alcohol in an amount of 11%, a mixture of caprylic and capric (C10) triglyceride in an amount of 5%, and isopropyl palmitate in an amount of 7%.

~~37.~~34. A method of treating plaque psoriasis (psoriasis vulgaris) in a mammal in need thereof, the method comprising topically administering to a psoriasis plaque on the mammal the composition of claim 22, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil is 0.05% to 2% by weight of the composition.

~~38. A method of treating plaque psoriasis (psoriasis vulgaris) in a mammal in need thereof, the method comprising topically administering to a psoriasis plaque on the mammal the composition of claim 31, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil HCl is 0.05% to 2% by weight of the composition.~~

~~39.~~35. The method of claim ~~34~~37, wherein the composition is topically administered to the psoriasis plaque twice daily for a duration of two to six weeks.

~~40. The method of claim 38, wherein the composition is topically administered to the psoriasis plaque twice daily for a duration of two to six weeks.~~

~~41. A method of treating atopic dermatitis in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim 23, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil is 0.05% to 2% by weight of the composition.~~

~~42.~~36. A method of treating atopic dermatitis in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim ~~29~~32, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil HCl is 0.05% to 2% by weight of the composition.

~~43. A method of treating acne in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim 23, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil is 0.05% to 2% by weight of the composition.~~

~~44.~~37. A method of treating acne in a mammal in need thereof, the method comprising topically administering to skin of the mammal the composition of claim ~~29~~32, wherein (1) the composition is in a form selected from the group consisting of a gel, a cream, and an ointment; and (2) the concentration of donepezil HCI is 0.05% to 2% by weight of the composition.