

CLAIMS

WHAT IS CLAIMED IS:

1. Use of varenicline, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment of dry eye or ocular discomfort, wherein the medicament is to be administered into a nasal cavity of an individual in need thereof.
2. Use of varenicline, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for increasing tear production, wherein the medicament is to be administered into a nasal cavity of an individual in need thereof.
3. The use according to claim 1, wherein the treatment is the treatment of dry eye.
4. The use according to claim 1, wherein the treatment is the treatment of ocular discomfort.
5. The use according to any one of claims 1 to 4, wherein the individual has undergone LASIK eye surgery.
6. The use according to any one of claims 1 to 5, wherein the varenicline, or a pharmaceutically acceptable salt thereof, does not cross the blood-brain barrier in a pharmacologically relevant concentration.
7. The use according to any one of claims 1 to 6, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered in an amount that is not systemically bioavailable.
8. The use according to any one of claims 1 to 7, wherein the varenicline, or a pharmaceutically acceptable salt thereof, selectively binds to a peripheral nicotinic acetylcholine receptor in an amount that does not result in undesired psychoactive side effects.
9. The use according to any one of claims 1 to 8, wherein the varenicline, or a pharmaceutically acceptable salt thereof, selectively binds to a peripheral nicotinic acetylcholine receptor in an amount that does not result in undesired systemic side effects.

10. The use according to any one of claims 1 or 3 to 9, wherein the treatment further comprises local administration of one or more substances that prevent entry or reduce entry of a nicotinic acetylcholine receptor into a desensitized state, or facilitate recovery of the nicotinic acetylcholine receptor from the desensitized state.
11. The use according to any one of claims 2 or 5 to 9, wherein the method further comprises local administration of one or more substances that prevent entry or reduce entry of a nicotinic acetylcholine receptor into a desensitized state, or facilitate recovery of the nicotinic acetylcholine receptor from the desensitized state.
12. The use according to claim 10 or 11, wherein the one or more substances are selected from protein kinase C (PKC) or factors that upregulate or up-modulate PKC, cAMP-dependent protein kinase (PKA) or factors that upregulate or up-modulate PKA, and calcineurin inhibitors.
13. The use according to claim 11, wherein the calcineurin inhibitor is selected from cyclosporine, pimecrolimus, and tacrolimus.
14. The use according to any one of claims 1 to 13, wherein between 5 micrograms and 1000 micrograms of varenicline, or a pharmaceutically acceptable salt thereof, is to be administered into the nasal cavity.
15. The use according to any one of claims 1 to 13, wherein between 5 micrograms and 100 micrograms of varenicline or a pharmaceutically acceptable salt thereof are to be administered into the nasal cavity.
16. The use according to any one of claims 1 to 13, wherein between 5 micrograms and 50 micrograms of varenicline, or a pharmaceutically acceptable salt thereof, are to be administered into the nasal cavity.
17. The use according to any one of claims 1 to 16, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered at least once daily.
18. The use according to any one of claims 1 to 16, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered at least twice daily.

19. The use according to any one of claims 1 to 16, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered at least once weekly.
20. The use according to any one of claims 1 to 19, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered into the nasal cavity as a liquid, suspension, aerosol, gel, ointment, dry powder, cream, paste, lotion, or balm.
21. The use according to any one of claims 1 to 20, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered into the nasal cavity by a syringe, dropper, bottle nebulizer, atomization pump, inhaler, powder spray device, vaporizer, patch, medicated stick, pipette, or jet of liquid.
22. The use according to any one of claims 1 to 20, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered in combination with use of a medical device.
23. The use according to claim 22, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered in combination with use of a punctal plug.
24. The use according to any one of claims 1 to 23, wherein a trigeminal nerve is activated.
25. The use according to claim 24, wherein an anterior ethmoidal nerve is activated.
26. The use according to any one of claims 1 to 25, wherein a nasolacrimal reflex is activated.
27. A pharmaceutical formulation comprising varenicline, or a pharmaceutically acceptable salt thereof, formulated to be administered into a nasal cavity and to prevent desensitization.
28. The pharmaceutical formulation of claim 27, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is formulated in a dosage amount that does not result in undesired psychoactive side effects.

29. The pharmaceutical formulation of claim 27 or 28, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is formulated in a dosage amount that is not systemically bioavailable.
30. The pharmaceutical formulation of any one of claims 27 to 29, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is formulated in a dosage amount that does not result in undesired systemic side effects.
31. The pharmaceutical formulation of any one of claims 27 to 30, further comprising one or more substances selected from protein kinase C (PKC) or factors that upregulate or up-modulate PKC, cAMP-dependent protein kinase (PKA) or factors that upregulate or up-modulate PKA, and calcineurin inhibitors.
32. The pharmaceutical formulation of claim 31, wherein the calcineurin inhibitor is selected from cyclosporine, pimecrolimus, and tacrolimus.
33. The pharmaceutical formulation of any one of claims 27 to 32, wherein the pharmaceutical formulation comprises about 1 mg/mL of varenicline, or a pharmaceutically acceptable salt thereof.
34. The pharmaceutical formulation of any one of claims 27 to 32, wherein the pharmaceutical formulation comprises about 10 mg/mL of varenicline, or a pharmaceutically acceptable salt thereof.
35. The pharmaceutical formulation of any one of claims 27 to 32, wherein the pharmaceutical formulation comprises about 20 mg/mL of varenicline, or a pharmaceutically acceptable salt thereof.
36. The pharmaceutical formulation of any one of claims 27 to 32, comprising between 5 micrograms and 1000 micrograms of varenicline, or a pharmaceutically acceptable salt thereof, per dose.
37. The pharmaceutical formulation of any one of claims 27 to 32, comprising between 5 micrograms and 50 micrograms of varenicline, or a pharmaceutically acceptable salt thereof, per dose.

38. The pharmaceutical formulation of any one of claims 27 to 32, comprising between 5 micrograms and 100 micrograms of varenicline, or a pharmaceutically acceptable salt thereof, per dose.
39. The pharmaceutical formulation of any one of claims 27 to 38, wherein the formulation is to be administered at least once daily.
40. The pharmaceutical formulation of any one of claims 27 to 38, wherein the formulation is to be administered at least twice daily.
41. The pharmaceutical formulation of any one of claims 27 to 38, wherein the formulation is to be administered at least once weekly.
42. The pharmaceutical formulation of any one of claims 27 to 41, wherein the formulation is to be administered into the nasal cavity as a liquid, suspension, aerosol, gel, ointment, dry powder, cream, paste, lotion, or balm.
43. The pharmaceutical formulation of any one of claims 27 to 41, wherein the formulation is to be administered into the nasal cavity by a syringe, dropper, bottle nebulizer, atomization pump, inhaler, powder spray device, vaporizer, patch, medicated stick, pipette, or jet of liquid.
44. The pharmaceutical formulation of any one of claims 27 to 41, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered in combination with the use of a medical device.
45. The pharmaceutical formulation of claim 44, wherein the varenicline, or a pharmaceutically acceptable salt thereof, is to be administered in combination with the use of a punctal plug.
46. Use of the pharmaceutical formulation of any one of claims 27 to 45 in the manufacture of a medicament for the treatment of dry eye.
47. Use of the pharmaceutical formulation of any one of claims 27 to 45 in the manufacture of a medicament for the treatment of ocular discomfort.

48. Use of the pharmaceutical formulation of any one of claims 27 to 45 in the manufacture of a medicament for a method for increasing tear production.

49. Products containing varenicline, or a pharmaceutically acceptable salt thereof, and one or more substances that prevent entry or reduce entry of a nicotinic acetylcholine receptor into a desensitized state, or facilitate recovery of the nicotinic acetylcholine receptor from the desensitized state as a combined preparation for simultaneous, separate or sequential use in therapy.

50. Products containing varenicline, or a pharmaceutically acceptable salt thereof, and one or more substances that prevent entry or reduce entry of a nicotinic acetylcholine receptor into a desensitized state, or facilitate recovery of the nicotinic acetylcholine receptor from the desensitized state as a combined preparation for use in the treatment of dry eye or ocular discomfort, wherein the use is simultaneous, separate or sequential use.

51. Products containing varenicline, or a pharmaceutically acceptable salt thereof, and one or more substances that prevent entry or reduce entry of a nicotinic acetylcholine receptor into a desensitized state, or facilitate recovery of the nicotinic acetylcholine receptor from the desensitized state as a combined preparation for use in increasing tear production, wherein the use is simultaneous, separate or sequential use.

52. The products in accordance with any one of claims 49 to 51, wherein the one or more substances are selected from protein kinase C (PKC) or factors that upregulate or up-modulate PKC, cAMP-dependent protein kinase (PKA) or factors that upregulate or up-modulate PKA, and calcineurin inhibitors.

53. The products in accordance with claim 52, wherein the calcineurin inhibitor is selected from cyclosporine, pimecrolimus, and tacrolimus.