CLAIMS

1. An oral pharmaceutical composition, comprising:
   a plurality of xanomeline beads having a core comprising xanomeline or a salt thereof and optionally a coating; and
   a plurality of trospium beads having a core comprising a salt of trospium and optionally a coating.
2. The oral pharmaceutical composition of claim 1, wherein the size of the xanomeline beads is between 0.425 mm and 1.18 mm.
3. The oral pharmaceutical composition of claim 2, wherein the size of the xanomeline beads is between 0.6 mm and 0.85 mm.
4. The oral pharmaceutical composition of any of claims 1 to 3, wherein the size of the trospium beads is between 0.425 mm and 1.18 mm.
5. The oral pharmaceutical composition of claim 4, wherein the size of the trospium beads is between 0.6 mm and 0.85 mm.
6. The oral pharmaceutical composition of any of claims 1 to 5, wherein the xanomeline beads contain at least about 2.5 times as much xanomeline as the trospium beads contain trospium salt.
7. The oral pharmaceutical composition of any of claims 1 to 6, the plurality of xanomeline and the plurality of trospium beads having a dissolution rate of more than about 95% within about the first 45 minutes following entry of the dosage form into an aqueous solution.
8. The oral pharmaceutical composition of claim 7, having a dissolution rate of more than about 95% within about the first 20 minutes following entry of the dosage form into an aqueous solution.
9. The oral pharmaceutical composition of any of claims 1 to 8, wherein the composition is to be administered to a patient for at least 7 days at 20 mg trospium twice daily to provide a mean C_{max} of trospium at 7850 ± 3360 pg/mL.

10. The oral pharmaceutical composition of any of claims 1 to 9, wherein the composition is to be administered to a patient for at least 7 days at 20 mg trospium twice daily to provide a mean AUC_{0-12} of 41900 ± 15500 hr·pg/mL.

11. The oral pharmaceutical composition of any of claims 1 to 10, wherein the xanomeline is xanomeline tartrate.

12. The oral pharmaceutical composition of claim 11, wherein the xanomeline beads comprise between 30 wt.% and 80 wt.% xanomeline tartrate.

13. The oral pharmaceutical composition of claim 12, wherein the xanomeline beads comprise 66 wt.% xanomeline tartrate.

14. The oral pharmaceutical composition of any of claims 1 to 13, wherein the xanomeline beads comprise between 15 wt.% and 65 wt.% microcrystalline cellulose.

15. The oral pharmaceutical composition of claim 12, wherein the xanomeline beads comprise 33.5 wt.% microcrystalline cellulose.

16. The oral pharmaceutical composition of any of claims 1 to 15, wherein the xanomeline beads comprise between 0 wt.% and 2 wt.% talc.

17. The oral pharmaceutical composition of claim 16, wherein the xanomeline beads comprise 0.5 wt.% talc.

18. The oral pharmaceutical composition of any of claims 1 to 10, wherein the xanomeline beads comprise between 30 wt.% and 80 wt.% xanomeline tartrate, between 15 wt.% and 65 wt.% microcrystalline cellulose, and between 0 wt.% and 2 wt.% talc.

19. The oral pharmaceutical composition of claim 18, wherein the xanomeline beads comprise 66 wt.% xanomeline tartrate, between 30 wt.% and 35 wt.% microcrystalline cellulose, and 0.5 wt.% talc.

20. The oral pharmaceutical composition of any of claims 1 to 19, wherein the trospium salt is trospium chloride.

21. The oral pharmaceutical composition of claim 20, wherein the trospium beads comprise between 8 wt.% and 35 wt.% trospium chloride.

22. The oral pharmaceutical composition of claim 21, wherein the trospium beads comprise 17.7 wt.% trospium chloride.

23. The oral pharmaceutical composition of any of claims 1 to 22, wherein the trospium beads comprise between 25 wt.% and 80 wt.% microcrystalline cellulose.

24. The oral pharmaceutical composition of claim 23, wherein the trospium beads comprise 46.8 wt.% microcrystalline cellulose.

25. The oral pharmaceutical composition of any of claims 1 or 24, wherein the trospium beads comprise between 15 wt.% and 70 wt.% lactose monohydrate.

26. The oral pharmaceutical composition of claim 25, wherein the trospium beads comprise 35 wt.% lactose monohydrate.

27. The oral pharmaceutical composition of any of claims 1 to 26, wherein the trospium beads comprise between 0 wt.% and 2 wt.% talc.

28. The oral pharmaceutical composition of claim 27, wherein the trospium beads comprise 0.5 wt.% talc.

29. The oral pharmaceutical composition of claims 1 to 19, wherein the trospium beads comprise between 8 wt.% and 35 wt.% trospium chloride, between 25 wt.% and 80 wt.% microcrystalline cellulose, between 15 wt.% and 70 wt.% lactose monohydrate, and between 0 wt.% and 2 wt.% talc.

30. The oral pharmaceutical composition of claim 29, wherein the trospium beads comprise 17.7 wt.% trospium chloride, 46.8 wt.% microcrystalline cellulose, 35 wt.% lactose monohydrate, and 0.5 wt.% talc.

31. The oral pharmaceutical composition of any of claims 1 to 30, further comprising a capsule containing the plurality of xanomeline beads and the plurality of trospium beads.

32. An oral pharmaceutical composition, comprising:

a plurality of xanomeline beads having a size between 0.425 mm and 1.18 mm, and core comprising between 30 wt.% and 80 wt.% xanomeline tartrate, and between 15 wt.% and 65 wt.% microcrystalline cellulose, and optionally a first coating comprising between 0 wt.% and 2 wt.% talc; and

a plurality of trospium beads having a size between 0.425 mm and 1.18 mm, and a core comprising between 8 wt.% and 35 wt.% trospium chloride, between 25 wt.% and 80 wt.% microcrystalline cellulose, and between 15 wt.% and 70 wt.% lactose monohydrate, and optionally a second coating comprising between 0 wt.% and 2 wt.% talc;

the plurality of xanomeline and the plurality of trospium beads having a dissolution rate of more than about 95% within about the first 45 minutes following entry of the dosage form

into an aqueous solution; and wherein, the composition is to be administered to a patient for at least 7 days at 20 mg trospium twice daily to provide a mean C_{max} of trospium at 7850 ± 3360 pg/mL and a mean $AUC_{0–12}$ of 41900 ± 15500 hr·pg/mL.

33. The oral pharmaceutical composition of claim 32, wherein the size of the xanomeline beads is between 0.6 mm and 0.85 mm.

34. The oral pharmaceutical composition of claim 32 or 33, wherein the size of the trospium beads is between 0.6 mm and 0.85 mm.

35. The oral pharmaceutical composition of any of claims 32 to 34, wherein the xanomeline beads contain at least about 2.5 times as much xanomeline as the trospium beads contain trospium chloride.

36. The oral pharmaceutical composition of any of claims 32 to 35, having a dissolution rate of the xanomeline and the trospium of more than about 95% within about the first 20 minutes following entry of the dosage form into an aqueous solution.

37. The oral pharmaceutical composition of any of claims 32 to 36, wherein the xanomeline beads comprise 66 wt.% xanomeline tartrate, between 30 wt.% and 35 wt.% microcrystalline cellulose, and 0.5 wt.% talc.

38. The oral pharmaceutical composition of any of claims 32 to 37, wherein the trospium beads comprise 17.7 wt.% trospium chloride, 46.8 wt.% microcrystalline cellulose, 35 wt.% lactose monohydrate, and 0.5 wt.% talc.

39. The oral pharmaceutical composition of any of claims 32 to 38, further comprising a capsule containing the plurality of xanomeline beads and the plurality of trospium beads.

40. An oral pharmaceutical composition, comprising:

a capsule containing a plurality of xanomeline beads and a plurality of trospium beads;

the plurality of xanomeline beads having a size between 0.6 mm and 0.85 mm, and core comprising between 66 wt.% xanomeline tartrate, and between 30 wt.% and 35 wt.% microcrystalline cellulose, and optionally a first coating composition 0.5 wt.% talc; and

the plurality of trospium beads having a size between 0.6 mm and 0.85 mm, and a core comprising 17.7 wt.% trospium chloride, 46.8 wt.% microcrystalline cellulose, and 35 wt.% lactose monohydrate, and optionally a second coating comprising 0.5 wt.% talc;

the plurality of xanomeline and the plurality of trospium beads having a dissolution rate of more than about 95% within about the first 20 minutes following entry of the dosage form into an aqueous solution; and

wherein, the composition is to be administered to a patient for at least 7 days at 20 mg trospium twice daily to provide a mean C_{max} of trospium at 7850 ± 3360 pg/mL and a mean $AUC_{0–12}$ of 41900 ± 15500 hr·pg/mL.

41. The oral pharmaceutical composition of any of claims 1 to 40, wherein the capsule has a dosage strength of 25 mg xanomeline free base and 10 mg trospium chloride.

42. The oral pharmaceutical composition of any of claims 1 to 40, wherein the capsule has a dosage strength of 50 mg xanomeline free base and 20 mg trospium chloride.

43. The oral pharmaceutical composition of claims 1 to 40, wherein the capsule has a dosage strength of 50 mg xanomeline free base and 10 mg trospium chloride.

44. The oral pharmaceutical composition of claims 1 to 40, wherein the capsule has a dosage strength of 75 mg xanomeline free base and 10 mg trospium chloride.

45. The oral pharmaceutical composition of claims 1 to 40, wherein the capsule has a dosage strength of 75 mg xanomeline free base and 20 mg trospium chloride.

46. The oral pharmaceutical composition of claims 1 to 40, wherein the capsule has a dosage strength of 125 mg xanomeline free base and 20 mg trospium chloride.

47. The oral pharmaceutical composition of claims 1 to 40, wherein the capsule has a dosage strength of 125 mg xanomeline free base and 30 mg trospium chloride.

48. The oral pharmaceutical composition of claims 1 to 40, wherein the capsule has a dosage strength of 125 mg xanomeline free base and 40 mg trospium chloride.

49. The oral pharmaceutical composition of any one of the preceding claims, wherein the xanomeline beads comprise less than 0.5 wt.% 3-[(4-hexyloxy)-1,2,5-thiadizaol-3-yl]-5-hydroxyl-1-methylpyridin-1-ium.

50. An oral pharmaceutical composition, comprising xanomeline and/or a salt thereof and trospium chloride for treating a muscarinic disorder in a patient in need thereof, wherein the composition is to be administered to the patient in need thereof to provide an *in-vivo* plasma profile comprising a median T_{max} for xanomeline of 2 hours and a median T_{max} for trospium of 1 hour.

51. The oral pharmaceutical composition of claim 50, wherein the *in-vivo* plasma profile further comprises a mean dose-normalized C_{max} of between 48.5 and 121.3 pg/mL/mg and a mean dose-normalized C_{max} of trospium of between 156 and 375 pg/mL/mg.

52. The oral pharmaceutical composition of claim 50 or 51, wherein the *in-vivo* plasma profile further comprises a mean dose-normalized $AUC_{0–12}$ of xanomeline of between 263 and 577 hr·pg/mL/mg and a mean dose-normalized $AUC_{0–12}$ of trospium of between 881 and 2024 hr·pg/mL/mg.

53. Use of an oral pharmaceutical composition of any of claims 1 to 52 in the manufacture of a medicament for treating a disorder ameliorated by activating muscarinic receptors in a subject in need thereof.

54. The use of any of claims 53 to 55, wherein the disorder is selected from schizophrenia, Alzheimer’s disease, Parkinson’s disease, depression, movement disorders, pain, drug addiction, tauopathy, and synucleinopathy.

55. An oral pharmaceutical composition, comprising xanomeline and/or a salt thereof and less than 0.5 wt.% 3-[(4-hexyloxy)-1,2,5-thiadiazaol-3-yl]-5-hydroxyl-1-methylpyridin-1-ium.

56. A method for preparing an oral pharmaceutical composition of any one of claims 1 to 52, comprising admixing beads comprising a plurality of xanomeline beads comprising xanomeline or a pharmaceutically acceptable salt thereof with a plurality of trospium beads comprising a salt of trospium.