What is claimed is:

1. A method of treating relapsing multiple sclerosis (RMS), comprising administering to a subject in need thereof a BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one.
2. A method of reducing the number of new gadolinium (Gd)-enhancing T1 hyperintense lesions, comprising administering to a subject in need thereof that has relapsing multiple sclerosis (RMS) a BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one.
3. A method of reducing the number of new or enlarging T2 lesions, comprising administering to a subject in need thereof that has relapsing multiple sclerosis (RMS) a BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one.
4. A method of reducing the total number of gadolinium (Gd)-enhancing T1 hyperintense lesions, comprising administering to a subject in need thereof that has relapsing multiple sclerosis (RMS) a BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one.
5. A method of reducing the rate of relapse in a subject having multiple sclerosis (MS), comprising administering to the subject in need thereof a BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one.
6. The method of any one of claims 1-5, wherein a dose of about 5 mg to about 60 mg of the BTK inhibitor is administered.
7. The method of any one of claims 1-6, wherein the dose is 5 mg.
8. The method of any one of claims 1-6, wherein the dose is 15 mg.
9. The method of any one of claims 1-6, wherein the dose is 30 mg.
10. The method of any one of claims 1-6, wherein the dose is 60 mg.
11. The method of any one of claims 1-10, wherein administration of the BTK inhibitor inhibits the formation of new active brain lesions as measured by MRI.
12. The method of any one of claims 1-11, wherein the dose is once daily.

13. The method of any one of claims 1-12, wherein the dose is administered once daily with food.

14. The method of any one of claims 1-6, 8, 11-12, wherein the dose of 15 mg is administered once daily with food.

15. The method of any one of claims 1-6, 9, 11-12, wherein the dose of 30 mg is administered once daily with food.

16. The method of any one of claims 1-6 and 10-12, wherein the dose of 60 mg is administered once daily with food.

17. The method of any one of claims 1-16, wherein administration of the BTK inhibitor reduces RGS1 expression in a brain cell.

18. The method of claim 17, wherein the brain cell comprises microglia.

19. The method of any one of claims 1-18, wherein administration of the BTK inhibitor reduces the number of new gadolinium (Gd)-enhancing T1 hyperintense lesions as measured by MRI.

20. The method of claim 19, wherein the number of new Gd-enhancing T1 hyperintense lesions is less than 1.

21. The method of claim 19, wherein no new Gd-enhancing T1 hyperintense lesions are formed after 12 weeks of BTK inhibitor treatment.

22. The method of any one of claims 1-2 or 4-21, wherein administration of the BTK inhibitor reduces the number of new or enlarging T2 lesions as measured by MRI.

23. The method of claim 22, wherein the number of new or enlarging T2 lesions is equal to or less than 2.

24. The method of claim 22, wherein no new or enlarging T2 lesion is formed after 12 weeks of BTK inhibitor treatment.

25. The method of any one of claims 1-3 or 5-24, wherein administration of the BTK inhibitor reduces the total number of Gd-enhancing T1-hyperintense lesions after 12 weeks of the BTK inhibitor treatment.

26. The method of any one of claims 1-5 or 16-25, wherein the dose is 60 mg, and wherein one or zero new Gd-enhancing T1 hyperintense lesions is formed after 12 weeks of BTK inhibitor treatment.

27. The method of claim 26, wherein zero new Gd-enhancing T1 hyperintense lesions is formed after 12 weeks of BTK inhibitor treatment.

28. The method of any one of claims 1-5 or 16-27, wherein the dose is 60 mg, and wherein the number of new or enlarging T2 lesions is equal to or less than 2 after 12 weeks of BTK inhibitor treatment.

29. The method of any one of claims 1-5 or 16-28, wherein the dose is 60 mg, and wherein the administration of the BTK inhibitor reduces the total number of Gd-enhancing T1-hyperintense lesions after 12 weeks of the BTK inhibitor treatment.

30. The method of any one of claims 1-29, wherein the BTK inhibitor compound is administered as monotherapy.

31. The method of any one of claims 1-30, wherein RMS is chosen from clinically isolated syndrome (CIS), relapsing remitting multiple sclerosis (RRMS), and relapsing secondary progressive multiple sclerosis (R-SPMS).

32. The method of any one of claims 1-31, wherein the subject is a human.

33. A method of treating relapsing multiple sclerosis (RMS), comprising administering to a subject in need thereof 60 mg BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one, wherein no new Gd-enhancing T1 hyperintense lesions are formed after 12 weeks of BTK administration.

34. A BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one for use in a method for treating relapsing multiple sclerosis (RMS) in a subject in need thereof.

35. A BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one for use in a method for reducing the number of new or enlarging T2 lesions in a subject that has relapsing multiple sclerosis (RMS).

36. A BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one for use in a method for reducing the total number of gadolinium (Gd)-enhancing T1 hyperintense lesions in a subject that has relapsing multiple sclerosis (RMS).

37. A BTK inhibitor comprising (R)-1-(1-acryloylpiperidin-3-yl)-4-amino-3-(4-phenoxyphenyl)-1H-imidazo[4,5-c]pyridin-2(3H)-one for use in a method for reducing the rate of relapse in a subject having multiple sclerosis (MS).