What is claimed is:

1. A method of treating amyotrophic lateral sclerosis (ALS) in a subject, wherein the method comprises administering a therapeutically effective amount of a dihydroorate dehydrogenase (DHODH) inhibitor to thesubject.

2. The method of claim 1, wherein administration of the DHODH inhibitor slows progression of ALS, reduces intensity of symptoms associated with ALS, delays onset of symptoms associated with ALS, reduces weight loss associated with ALS, reverses weight loss associated with ALS, delays mortality, or combinations thereof.

3. The method of claim 2, wherein the symptoms associated with ALS are selected from group consisting of fine motor function, gross motor function, bulbar function, respiratory function, and combinations thereof.

4. The method of claim 2 or 3, wherein the symptoms associated with ALS are selected from the group consisting of muscle twitching, muscle weakness, muscle control, walking, speech, eating, swallowing, writing, climbing stairs, cutting food, turning in bed, salivation, dressing, maintaining hygiene, breathing, dyspnea, orthopnea, respiratory insufficiency, and combinations thereof.

5. The method of any one of claims 1-4, wherein the subject is at risk of having ALS.

6. The method of any one of claims 1-4, wherein the subject has been diagnosed with ALS.

7. The method of claim 5 or 6, wherein the subject is not exhibiting symptoms of ALS.

8. A method for delaying mortality in a subject having or is at risk of having amyotrophic lateral sclerosis (ALS), wherein the method comprises administering a therapeutically effective amount of a dihydroorate dehydrogenase (DHODH) inhibitor to the subject.

9. The method of claim 8, wherein administration of the DHODH inhibitor prevents or delays the onset of respiratory failure.

10. The method of claim 8 or 9, wherein the method delays mortality associated with respiratory failure.

11. The method of any one of claims 8-10, wherein the subject is at risk of having ALS.

12. The method of any one of claims 8-10, wherein the subject has been diagnosed with ALS.

13. The method of any one of claims 8-12, wherein the subject is not exhibiting symptoms of ALS.

14. The method of any one of claims 1-13, wherein the ALS is familial ALS.

15. The method of any one of claims 1-13, wherein the ALS is sporadic ALS.

16. The method of any one of claims 1-15, wherein the ALS is a mammal.

17. The method of claim 16, wherein the subject is a human patient.

18. The method of claim 17, wherein the subject is an adult.

19. The method of claim 17 or 18, wherein the subject is female.

20. The method of claim 17 or 18, wherein the subject is male.

21. The method of any one of claims 1-20, wherein the DHODH inhibitor is a small molecule chemical compound, antibody, nucleic acid molecule, polypeptide, or fragment thereof.

22. The method of claim 21, wherein the method is a small molecule chemical compound.

23. The method of claim 21 or 22, wherein the DHODH inhibitor inhibits biosynthesis of pyrimidine nucleotides.

24. The method of any one of claims 21-23, wherein the DHODH inhibitor binds to DHODH.

25. The method of any one of claims 21-24, wherein the DHODH inhibitor is a substrate-like inhibitor; an isoxazolecarboxanilide or 3-hydroxy-2-cyanocrotanilide; a triazolopyrimidine based inhibitor; a trifluoromethy phenyl butenamide derivative; an ethoxy aromatic amide-based inhibitor; a cyclic aliphatic or aromatic carboxylic acid amide; an aromatic quinoline carboxamide derivative; a 2-phenylquinoline-4-carboxylic acid derivative; an aryl carboxylic acid amide derivative; a cyclopentene dicarboxylic acid amide derivative; a terphenyl carboxylic acid amide derivative; a cyclopropane carbonyl derivative; a biaryl carboxyamide derivative; a biphenyl-4-ylcarbamoyl thiophene/cyclopentene carboxylic acid derivative; an amino-benzoic acid derivative, an N-arylaminomethylene malonate derivative; a 4-hydroxycoumarin, fenamic acid or N-(alkylcarbonyl) anthranilic acid derivative; an alkyl-5-benzimidazole thiophene-2-carboxamide derivative; an amino nicotinic acid or isonicotinic acid derivative; or a salt thereof.

26. The method of claim 25, wherein the DHODH inhibitor is (Z)-2-cyano-3-hydroxy-but-2-enoic acid-(4’-trifluoromethylphenyl)-amide or a salt thereof.

27. The method of any one of claims 1-26, wherein the DHODH inhibitor is administered orally.

28. The method of any one of claims 1-27, wherein the method comprises administering about 7 mg to about 14 mg of the DHODH inhibitor to the subject.

29. The method of any one of claims 1-27, wherein the method comprises administering about 0.001 mg/kg to about 100 mg/kg of the DHODH inhibitor to the subject.

30. The method of any one of claims 1-29, wherein the DHODH inhibitor is administered once daily.

31. The method of any one of claims 1-30, wherein the method further comprises administering at least one additional agent to treat a symptom associated with ALS.

32. A method for delaying mortality in a human subject having or is at risk of having amyotrophic lateral sclerosis (ALS), wherein the method comprises administering a therapeutically effective amount of a dihydroorate dehydrogenase (DHODH) inhibitor to the subject, and wherein the DHODH inhibitor is (Z)-2-cyano-3-hydroxy-but-2-enoic acid-(4'-trifluoromethylphenyl)-amide or a salt thereof.

33. The method of claim 32, wherein administration of the DHODH inhibitor prevents or delays the onset of respiratory failure.

34. The method of claim 32 or 33, wherein the method delays mortality associated with respiratory failure.

35. The method of any one of claims 32-34, wherein the subject is at risk of having ALS.

36. The method of any one of claims 32-34, wherein the subject has been diagnosed with ALS.

37. The method of any one of claims 32-36, wherein the subject is not exhibiting symptoms of ALS.

38. The method of any one of claims 32-37, wherein the ALS is familial ALS.

39. The method of any one of claims 32-37, wherein the ALS is sporadic ALS.

40. The method of any one of claims 32-39, wherein the subject is an adult.

41. The method of claim 40, wherein the subject is female.

42. The method of claim 40, wherein the subject is male.

43. The method of any one of claims 32-42, wherein the DHODH inhibitor is administered orally.

44. The method of any one of claims 32-43, wherein the method comprises administering about 7 mg to about 14 mg of the DHODH inhibitor to the subject.

45. The method of any one of claims 32-43, wherein the method comprises administering about 0.001 mg/kg to about 100 mg/kg of the DHODH inhibitor to the subject.

46. The method of any one of claims 32-45, wherein the DHODH inhibitor is administered once daily.

47. The method of any one of claims 32-46, wherein the method further comprises administering at least one additional agent to treat a symptom associated with ALS.

48. A dihydroorate dehydrogenase (DHODH) inhibitor for use in the method of any one of claims 1-47.

49. A composition comprising a dihydroorate dehydrogenase (DHODH) inhibitor for use in the method of any one of claims 1-47.

50. The composition of claim 49, wherein the composition further comprises a pharmaceutically acceptable carrier, diluent, or excipient.

51. The composition of claim 49 or 50, wherein the composition further comprises at least one additional agent to treat a symptom associated with ALS.

52. A kit comprising a dihydroorate dehydrogenase (DHODH) inhibitor for use in the method of any one of claims 1-47.

53. The kit of claim 52, wherein the kit further comprises at least one additional agent to treat a symptom associated with ALS.

What is claimed is:

1. Use of a therapeutically effective amount of a dihydroorate dehydrogenase (DHODH) inhibitor in the manufacture of a medicament for the treatment of amyotrophic lateral sclerosis (ALS) in a subject.

2. The use of claim 1, wherein the DHODH inhibitor slows progression of ALS, reduces intensity of symptoms associated with ALS, delays onset of symptoms associated with ALS, reduces weight loss associated with ALS, reverses weight loss associated with ALS, delays mortality, or combinations thereof.

3. The use of claim 2, wherein the symptoms associated with ALS are selected from group consisting of fine motor function, gross motor function, bulbar function, respiratory function, and combinations thereof.

4. The use of claim 2 or 3, wherein the symptoms associated with ALS are selected from the group consisting of muscle twitching, muscle weakness, muscle control, walking, speech, eating, swallowing, writing, climbing stairs, cutting food, turning in bed, salivation, dressing, maintaining hygiene, breathing, dyspnea, orthopnea, respiratory insufficiency, and combinations thereof.

5. The use of any one of claims 1-4, wherein the subject is at risk of having ALS.

6. The use of any one of claims 1-4, wherein the subject has been diagnosed with ALS.

7. The use of claim 5 or 6, wherein the subject is not exhibiting symptoms of ALS.

8. Use of a therapeutically effective amount of a dihydroorate dehydrogenase (DHODH) inhibitor in the manufacture of a medicament for delaying mortality in a subject having or is at risk of having amyotrophic lateral sclerosis (ALS).

9. The use of claim 8, wherein the DHODH inhibitor prevents or delays the onset of respiratory failure.

10. The use of claim 8 or 9, wherein the use delays mortality associated with respiratory failure.

11. The use of any one of claims 8-10, wherein the subject is at risk of having ALS.

12. The use of any one of claims 8-10, wherein the subject has been diagnosed with ALS.

13. The use of any one of claims 8-12, wherein the subject is not exhibiting symptoms of ALS.

14. The use of any one of claims 1-13, wherein the ALS is familial ALS.

15. The use of any one of claims 1-13, wherein the ALS is sporadic ALS.

16. The use of any one of claims 1-15, wherein the ALS is a mammal.

17. The use of claim 16, wherein the subject is a human patient.

18. The use of claim 17, wherein the subject is an adult.

19. The use of claim 17 or 18, wherein the subject is female.

20. The use of claim 17 or 18, wherein the subject is male.

21. The use of any one of claims 1-20, wherein the DHODH inhibitor is a small molecule chemical compound, antibody, nucleic acid molecule, polypeptide, or fragment thereof.

22. The use of claim 21, wherein the DHODH inhibitoris a small molecule chemical compound.

23. The use of claim 21 or 22, wherein the DHODH inhibitor inhibits biosynthesis of pyrimidine nucleotides.

24. The use of any one of claims 21-23, wherein the DHODH inhibitor binds to DHODH.

25. The use of any one of claims 21-24, wherein the DHODH inhibitor is a substrate-like inhibitor; an isoxazolecarboxanilide or 3-hydroxy-2-cyanocrotanilide; a triazolopyrimidine based inhibitor; a trifluoromethy phenyl butenamide derivative; an ethoxy aromatic amide-based inhibitor; a cyclic aliphatic or

aromatic carboxylic acid amide; an aromatic quinoline carboxamide derivative; a 2-phenylquinoline-4-carboxylic acid derivative; an aryl carboxylic acid amide derivative; a cyclopentene dicarboxylic acid amide derivative; a terphenyl carboxylic acid amide derivative; a cyclopropane carbonyl derivative; a biaryl carboxyamide derivative; a biphenyl-4-ylcarbamoyl thiophene/cyclopentene carboxylic acid derivative; an amino-benzoic acid derivative, an N-arylaminomethylene malonate derivative; a 4-hydroxycoumarin, fenamic acid or N-(alkylcarbonyl) anthranilic acid derivative; an alkyl-5-benzimidazole thiophene-2-carboxamide derivative; an amino nicotinic acid or isonicotinic acid derivative; or a salt thereof.

26. The use of claim 25, wherein the DHODH inhibitor is (Z)-2-cyano-3-hydroxy-but-2-enoic acid-(4'-trifluoromethylphenyl)-amide or a salt thereof.

27. The use of any one of claims 1-26, wherein the DHODH inhibitor is administered orally.

28. The use of any one of claims 1-27, wherein the medicament comprises about 7 mg to about 14 mg of the DHODH inhibitor to be administered to the subject.

29. The use of any one of claims 1-27, wherein the medicament comprises about 0.001 mg/kg to about 100 mg/kg of the DHODH inhibitor to be administered to the subject.

30. The use of any one of claims 1-29, wherein the DHODH inhibitor is administered once daily.

31. The use of any one of claims 1-30, wherein the use further comprises administering at least one additional agent to treat a symptom associated with ALS.

32. Use of a therapeutically effective amount of a dihydroorate dehydrogenase (DHODH) inhibitor in the manufacture of a medicament for delaying mortality in a human subject having or is at risk of having amyotrophic lateral sclerosis (ALS), and wherein the DHODH inhibitor is (Z)-2-cyano-3-hydroxy-but-2-enoic acid-(4'-trifluoromethylphenyl)-amide or a salt thereof.

33. The use of claim 32, wherein the DHODH inhibitor prevents or delays the onset of respiratory failure.

34. The use of claim 32 or 33, wherein the use delays mortality associated with respiratory failure.

35. The use of any one of claims 32-34, wherein the subject is at risk of having ALS.

36. The use of any one of claims 32-34, wherein the subject has been diagnosed with ALS.

37. The use of any one of claims 32-36, wherein the subject is not exhibiting symptoms of ALS.

38. The use of any one of claims 32-37, wherein the ALS is familial ALS.

39. The use of any one of claims 32-37, wherein the ALS is sporadic ALS.

40. The use of any one of claims 32-39, wherein the subject is an adult.

41. The use of claim 40, wherein the subject is female.

42. The use of claim 40, wherein the subject is male.

43. The use of any one of claims 32-42, wherein the DHODH inhibitor is administered orally.

44. The use of any one of claims 32-43, wherein the medicament comprises about 7 mg to about 14 mg of the DHODH inhibitor to be administered to the subject.

45. The use of any one of claims 32-43, wherein the medicament comprises about 0.001 mg/kg to about 100 mg/kg of the DHODH inhibitor to be administered to the subject.

46. The use of any one of claims 32-45, wherein the DHODH inhibitor is administered once daily.

47. The use of any one of claims 32-46, wherein the use further comprises administering at least one additional agent to treat a symptom associated with ALS.

48. A dihydroorate dehydrogenase (DHODH) inhibitor for use in the use of any one of claims 1-47.

49. A composition comprising a dihydroorate dehydrogenase (DHODH) inhibitor for use in the use of any one of claims 1-47.

50. The composition of claim 49, wherein the composition further comprises a pharmaceutically acceptable carrier, diluent, or excipient.

51. The composition of claim 49 or 50, wherein the composition further comprises at least one additional agent to treat a symptom associated with ALS.

52. A kit comprising a dihydroorate dehydrogenase (DHODH) inhibitor for use in the use of any one of claims 1-47.

53. The kit of claim 52, wherein the kit further comprises at least one additional agent to treat a symptom associated with ALS.