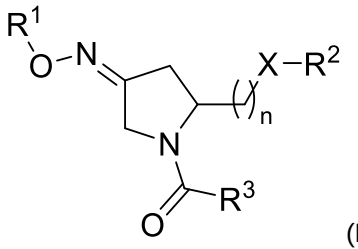
CLAIMS

1. A method of treating a subject undergoing embryo transfer therapy, the method comprising administering to the subject a therapeutically effective amount of a compound represented by formula (**I**)



(**I**)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

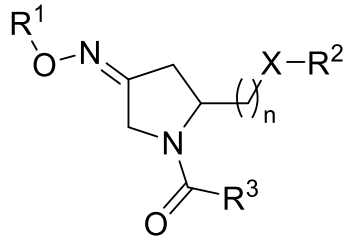
X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose,

wherein the compound is administered to the subject prior to transfer of one or more embryos to the uterus of the subject, and optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

2. A method of treating a subject undergoing embryo transfer therapy, the method comprising transferring one or more embryos to the uterus of the subject, wherein the subject has been previously administered a therapeutically effective amount of a compound represented by formula (**I**)



(**I**)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

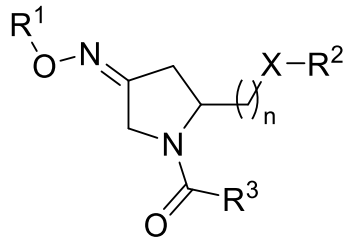
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose, and optionally

wherein administration of the compound reduces the likelihood of embryo implantation failure and/or miscarriage.

3. A method of treating a subject undergoing embryo transfer therapy, the method comprising:

a. administering to the subject a therapeutically effective amount of a compound represented by formula (**I**)



(**I**)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

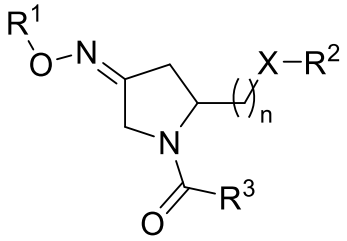
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose; and

b. transferring one or more embryos to the uterus of the subject following administration of the compound;

optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

4. A method of treating a subject undergoing embryo transfer therapy, the method comprising administering to the subject a therapeutically effective amount of a compound represented by formula (**I**)



(**I**)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy,

alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

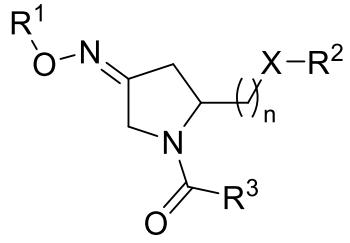
X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg,

wherein the compound is administered to the subject prior to transfer of one or more embryos to the uterus of the subject, and optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

5. A method of treating a subject undergoing embryo transfer therapy, the method comprising transferring one or more embryos to the uterus of the subject, wherein the subject has been previously administered a therapeutically effective amount of a compound represented by formula (**I**)



(**I**)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl

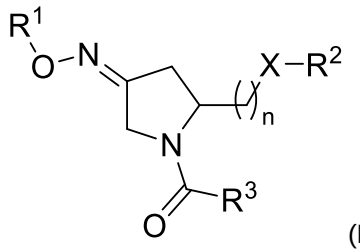
heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg, and optionally

wherein administration of the compound reduces the likelihood of embryo implantation failure and/or miscarriage.

6. A method of treating a subject undergoing embryo transfer therapy, the method comprising:

a. administering to the subject a therapeutically effective amount of a compound represented by formula (**I**)



(**I**)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg; and

b. transferring one or more embryos to the uterus of the subject following administration of the compound;

optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

7. The method of any one of claims 1-6, wherein the compound is administered to the subject from about 1 hour to about 24 hours prior to the transfer of the one or more embryos to the subject.

8. The method of claim 7, wherein the compound is administered to the subject from about 1 hour to about 8 hours prior to the transfer of the one or more embryos to the subject.

9. The method of claim 8, wherein the compound is administered to the subject from about 3 hours to about 5 hours prior to the transfer of the one or more embryos to the subject.

10. The method of claim 9, wherein the compound is administered to the subject about 4 hours prior to the transfer of the one or more embryos to the subject.

11. The method of any one of claims 1-10, wherein the compound is administered to the subject in a single dose.

12. The method of any one of claims 1-10, wherein the compound is administered to the subject in multiple doses.

13. The method of claim 12, wherein the compound is administered to the subject in from 1 to 20 doses per day prior to the transfer of the one or more embryos to the subject.

14. The method of claim 13, wherein the compound is administered to the subject in from 1 to 7 doses per day prior to the transfer of the one or more embryos to the subject.

15. The method of any one of claims 12-14, wherein the compound is administered to the subject once daily for from about 1 day to about 14 days prior to the transfer of the one or more embryos to the subject.

16. The method of claim 15, wherein the compound is administered to the subject once daily for from about 3 days to about 11 days prior to the transfer of the one or more embryos to the subject.

17. The method of claim 16, wherein the compound is administered to the subject once daily for 7 days prior to the transfer of the one or more embryos to the subject.

18. The method of any one of claims 12-17, wherein the compound is additionally administered to the subject concurrently with the transfer of the one or more embryos to the subject

19. The method of any one of claims 12-18, wherein the compound is additionally administered to the subject following the transfer of the one or more embryos to the subject.

20. The method of claim 19, wherein the compound is additionally administered to the subject from about 1 hour to about 24 hours following the transfer of the one or more embryos to the subject.

~~21. The method of claim 19 or 20, wherein the compound is additionally administered to the subject in from 1 to 20 doses per day following the transfer of the one or more embryos to the subject.~~

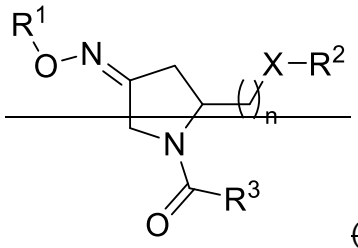
~~22. The method of claim 21, wherein the compound is additionally administered to the subject in from 1 to 7 doses per day following the transfer of the one or more embryos to the subject.~~

~~23. The method of any one of claims 19-21, wherein the compound is additionally administered to the subject once daily for from about 1 day to about 14 days following the transfer of the one or more embryos to the subject.~~

~~24. The method of claim 23, wherein the compound is additionally administered to the subject once daily for from about 3 days to about 11 days following the transfer of the one or more embryos to the subject.~~

~~25. The method of claim 24, wherein the compound is additionally administered to the subject once daily for 7 days following the transfer of the one or more embryos to the subject.~~

~~26. A method of treating a subject undergoing embryo transfer therapy, the method comprising administering to the subject a therapeutically effective amount of a compound represented by formula (I)~~



~~(I)~~

~~or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein~~

~~n is an integer from 1 to 3;~~

~~R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;~~

~~R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;~~

R^3 is selected from the group consisting of aryl and heteroaryl;

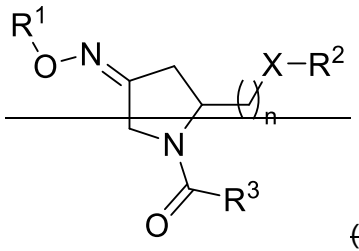
X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose,

wherein the compound is administered concurrently with transfer of one or more embryos to the uterus of the subject, and optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

27. A method of treating a subject undergoing embryo transfer therapy, the method comprising transferring one or more embryos to the uterus of the subject, wherein the subject is concurrently administered a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

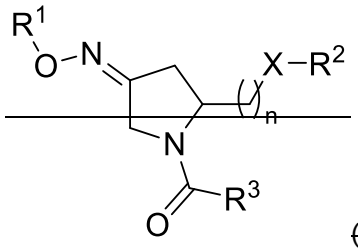
wherein the compound is administered to the subject in an amount of from about 1,500 mg to

about 2,700 mg per dose, and

optionally wherein administration of the compound reduces the likelihood of embryo implantation failure and/or miscarriage.

28. A method of treating a subject undergoing embryo transfer therapy, the method comprising:

a. administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

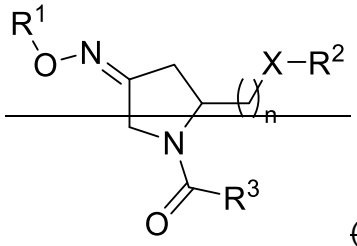
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose; and

b. transferring one or more embryos to the uterus of the subject concurrently with administration of the compound;

optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

29. A method of treating a subject undergoing embryo transfer therapy, the method comprising administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

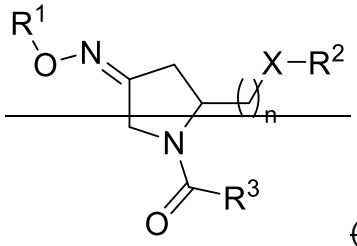
X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg,

wherein the compound is administered concurrently with transfer of one or more embryos to the uterus of the subject, and optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

30. A method of treating a subject undergoing embryo transfer therapy, the method comprising transferring one or more embryos to the uterus of the subject, wherein the subject is concurrently administered a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

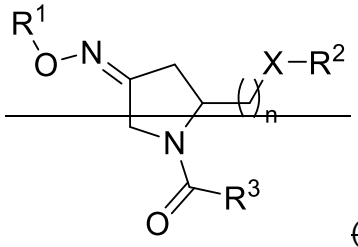
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg, and

optionally wherein administration of the compound reduces the likelihood of embryo implantation failure and/or miscarriage.

31. A method of treating a subject undergoing embryo transfer therapy, the method comprising:

a. administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy,

alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg; and

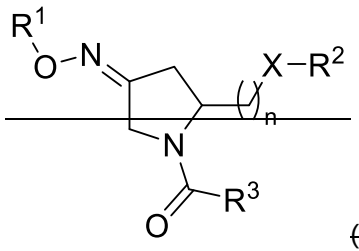
b. transferring one or more embryos to the uterus of the subject concurrently with administration of the compound;

optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

32. The method of any one of claims 26-31, wherein the compound is administered to the subject in a single dose.

33. The method of any one of claims 26-31, wherein the compound is administered to the subject in multiple doses.

34. A method of treating a subject undergoing embryo transfer therapy, the method comprising administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy,

alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

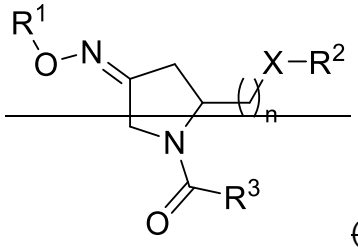
X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose,

wherein the compound is administered to the subject following transfer of one or more embryos to the uterus of the subject, and optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

35. A method of treating a subject undergoing embryo transfer therapy, the method comprising transferring one or more embryos to the uterus of the subject, wherein the subject is subsequently administered a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl

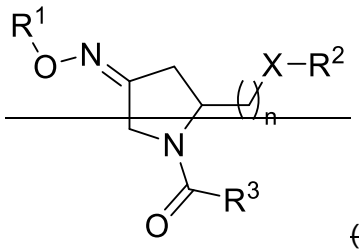
heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose, and

wherein administration of the compound reduces the likelihood of embryo implantation failure and/or miscarriage.

36. A method of treating a subject undergoing embryo transfer therapy, the method comprising:

a. administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

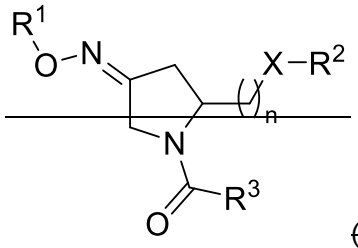
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in an amount of from about 1,500 mg to about 2,700 mg per dose; and

b. transferring one or more embryos to the uterus of the subject prior to administration of the compound;

optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

37. A method of treating a subject undergoing embryo transfer therapy, the method comprising administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

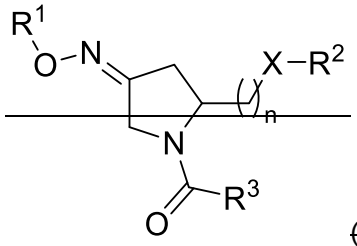
X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg,

wherein the compound is administered to the subject following transfer of one or more embryos to the uterus of the subject, and optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

38. A method of treating a subject undergoing embryo transfer therapy, the method comprising transferring one or more embryos to the uterus of the subject, wherein the subject is subsequently administered a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

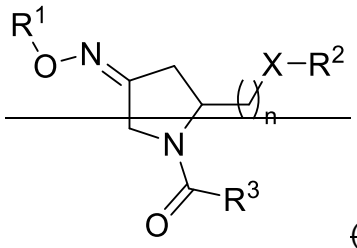
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg, and

wherein administration of the compound reduces the likelihood of embryo implantation failure and/or miscarriage.

39. A method of treating a subject undergoing embryo transfer therapy, the method comprising:

a. administering to the subject a therapeutically effective amount of a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

wherein the compound is administered to the subject in one or more doses totaling from about 1,500 mg to about 2,700 mg; and

b. transferring one or more embryos to the uterus of the subject prior to administration of the compound;

optionally wherein the administering reduces the likelihood of embryo implantation failure and/or miscarriage.

40. The method of any one of claims 34-39, wherein the compound is administered to the subject from about 1 hour to about 24 hours following the transfer of the one or more embryos to the subject.

41. The method of any one of claims 34-40, wherein the compound is administered to the subject in a single dose.

42. The method of any one of claims 34-40, wherein the compound is administered to the subject in multiple doses.

43. The method of claim 42, wherein the compound is administered to the subject in from 1 to 20 doses per day following the transfer of the one or more embryos to the subject.

44. The method of claim 43, wherein the compound is administered to the subject in from 1 to 7 doses per day following the transfer of the one or more embryos to the subject.

45. The method of any one of claims 42-44, wherein the compound is administered to the subject once daily for from about 1 day to about 14 days following the transfer of the one or more embryos to the subject.

~~46. The method of claim 45, wherein the compound is administered to the subject once daily for from about 3 days to about 11 days following the transfer of the one or more embryos to the subject.~~

~~47. The method of claim 46, wherein the compound is administered to the subject once daily for 7 days following the transfer of the one or more embryos to the subject.~~

~~48. The method of any one of claims 42-47, wherein the compound is additionally administered to the subject concurrently with the transfer of the one or more embryos to the subject.~~

~~49. The method of any one of claims 42-48, wherein the compound is additionally administered to the subject prior to the transfer of the one or more embryos to the subject.~~

~~50. The method of claim 49, wherein the compound is additionally administered to the subject from about 1 hour to about 24 hours prior to the transfer of the one or more embryos to the subject.~~

~~51. The method of claim 50, wherein the compound is additionally administered to the subject from about 1 hour to about 8 hours prior to the transfer of the one or more embryos to the subject.~~

~~52. The method of claim 51, wherein the compound is additionally administered to the subject from about 3 hours to about 5 hours prior to the transfer of the one or more embryos to the subject.~~

~~53. The method of claim 52, wherein the compound is additionally administered to the subject about 4 hours prior to the transfer of the one or more embryos to the subject.~~

~~54. The method of any one of claims 49-53, wherein the compound is additionally administered to the subject in from 1 to 20 doses per day prior to the transfer of the one or more embryos to the subject.~~

~~55. The method of claim 54, wherein the compound is additionally administered to the subject in from 1 to 7 doses per day prior to the transfer of the one or more embryos to the subject.~~

~~56. The method of any one of claims 49-55, wherein the compound is additionally administered to the subject once daily for from about 1 day to about 14 days prior to the transfer of the one or more embryos to the subject.~~

~~57. The method of claim 56, wherein the compound is additionally administered to the subject once daily for from about 3 days to about 11 days prior to the transfer of the one or more embryos to the subject.~~

~~58. The method of claim 57, wherein the compound is additionally administered to the subject once daily for 7 days prior to the transfer of the one or more embryos to the subject.~~

~~59. The method of any one of claims 1-58, wherein administration of the compound reduces the likelihood of the subject having a miscarriage following the transfer of the one or more embryos.~~

~~60. The method of any one of claims 1-59, wherein the compound is administered to the subject in an amount sufficient to achieve a plasma concentration of the compound in the subject of from about 1 μM to about 20 μM.~~

~~61. The method of claim 60, wherein the plasma concentration is achieved within from about 1 hour to about 3 hours of administering the compound to the subject.~~

~~62. The method of any one of claims 1-51, wherein from 1 to 2 embryos are transferred to the subject.~~

~~63. The method of claim 62, wherein 1 embryo is transferred to the subject.~~

~~64. The method of claim 62, wherein 2 embryos are transferred to the subject.~~

~~65. The method of any one of claims 1-64, wherein the subject is a mammal and the one or more embryos are mammalian embryos.~~

~~66. The method of claim 65, wherein the mammal is a human and the one or more mammalian embryos are human embryos.~~

~~67. The method of any one of claims 1-66, wherein the one or more embryos are produced ex vivo by in vitro fertilization (IVF).~~

~~68. The method of claim 67, wherein the one or more embryos are produced ex vivo by IVF of one or more ova derived from the subject.~~

~~69. The method of any one of claims 1-66, wherein the one or more embryos are produced ex vivo by intracytoplasmic sperm injection (ICSI).~~

~~70. The method of claim 69, wherein the one or more embryos are produced ex vivo by ICSI into one or more ova derived from the subject.~~

~~71. The method of claim 68 or 70, wherein the one or more ova are derived from one or more oocytes isolated from the subject.~~

~~72. The method of claim 71, wherein the one or more oocytes are isolated from the subject from about 1 day to about 7 days prior to the transfer of the one or more embryos to the subject.~~

~~73. The method of claim 72, wherein the one or more oocytes are isolated from the subject about 2 days prior to the transfer of the one or more embryos to the subject.~~

~~74. The method of claim 72, wherein the one or more oocytes are isolated from the subject about 3 days prior to the transfer of the one or more embryos to the subject.~~

~~75. The method of claim 72, wherein the one or more oocytes are isolated from the subject about 4 days prior to the transfer of the one or more embryos to the subject.~~

~~76. The method of claim 72, wherein the one or more oocytes are isolated from the subject about 5 days prior to the transfer of the one or more embryos to the subject.~~

~~77. The method of any one of claims 71-76, wherein the one or more oocytes comprise from 1 to 4 mature oocytes.~~

~~78. The method of any one of claims 71-77, wherein a gonadotropin-releasing hormone (GnRH) antagonist is administered to the subject prior to isolation of the one or more oocytes from the subject.~~

~~79. The method of any one of claims 71-78, wherein human chorionic gonadotropin (hCG) is administered to the subject prior to isolation of the one or more oocytes from the subject.~~

~~80. The method of claim 79, wherein the hCG is administered to the subject by a single intravenous injection.~~

~~81. The method of any one of claims 71-80, wherein progesterone is administered to the subject following isolation of the one or more oocytes from the subject.~~

~~82. The method of claim 81, wherein the progesterone is administered intravaginally.~~

~~83. The method of claim 81 or 82, wherein from about 300 mg to about 600 mg of progesterone per dose is administered to the subject.~~

~~84. The method of any one of claims 81-83, wherein the progesterone is administered to the subject daily, preferably beginning within about 24 hours of isolation of the one or more oocytes from the subject and continuing for about 6 or more weeks following the transfer of the one or more embryos to the subject.~~

~~85. The method of claim 68 or 70, wherein the one or more ova are isolated directly from the subject.~~

~~86. The method of claim 85, wherein the one or more ova are isolated from the subject from about 1 day to about 7 days prior to the transfer of the one or more embryos to the subject.~~

87. The method of claim 86, wherein the one or more ova are isolated from the subject about 2 days prior to the transfer of the one or more embryos to the subject.

88. The method of claim 86, wherein the one or more ova are isolated from the subject about 3 days prior to the transfer of the one or more embryos to the subject.

89. The method of claim 86, wherein the one or more ova are isolated from the subject about 4 days prior to the transfer of the one or more embryos to the subject.

90. The method of claim 86, wherein the one or more ova are isolated from the subject about 5 days prior to the transfer of the one or more embryos to the subject.

91. The method of any one of claims 85-90, wherein a GnRH antagonist is administered to the subject prior to isolation of the one or more ova from the subject.

92. The method of any one of claims 85-91, wherein hCG is administered to the subject prior to isolation of the one or more ova from the subject.

93. The method of claim 92, wherein the hCG is administered to the subject by a single intravenous injection.

94. The method of any one of claims 85-93, wherein progesterone is administered to the subject following isolation of the one or more ova from the subject.

95. The method of claim 94, wherein the progesterone is administered intravaginally.

96. The method of claim 94 or 95, wherein from about 300 mg to about 600 mg of progesterone per dose is administered to the subject.

97. The method of any one of claims 94-96, wherein the progesterone is administered to the subject daily, preferably beginning within about 24 hours of isolation of the one or more ova from the subject and continuing for about 6 or more weeks following the transfer of the one or more embryos to the subject.

98. The method of any one of claims 71-84, wherein the one or more embryos are transferred to the subject during the same menstrual cycle as isolation of the one or more oocytes from the subject.

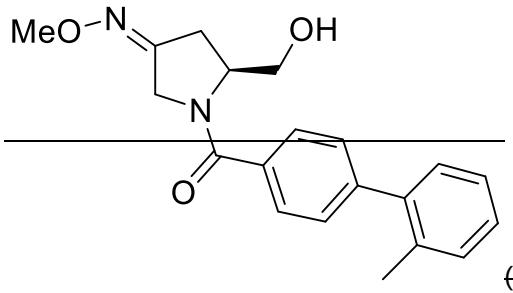
99. The method of any one of claims 85-97, wherein the one or more embryos are transferred to the subject during the same menstrual cycle as isolation of the one or more ova from the subject.

100. The method of any one of claims 1-99, wherein the one or more embryos are frozen and thawed prior to the transfer of the one or more embryos to the subject.

101. The method of any one of claims 1-100, wherein the one or more embryos each comprise from 6 to 8 blastomeres immediately prior to the transfer of the one or more embryos to the subject.

102. The method of claim 101, wherein the blastomeres are of approximately equal sizes as assessed by visual microscopy.

103. The method of any one of claims 1-102, wherein the compound is represented by formula (II)



(II).

104. The method of claim 103, wherein the compound is in a crystalline state.

105. The method of claim 104, wherein the compound exhibits characteristic X-ray powder diffraction peaks at about 7.05° 2θ, about 13.13° 2θ, and about 23.34° 2θ.

106. The method of any one of claims 1-105, wherein the compound is administered orally to the subject.

107. The method of any one of claims 1-106, wherein the compound is administered to the subject in the form of a tablet, capsule, gel cap, powder, liquid solution, or liquid suspension.

108. The method of claim 107, wherein the compound is administered to the subject in the form of a tablet.

109. The method of claim 108, wherein the tablet is a dispersible tablet.

110. The method of claim 109, wherein the dispersible tablet comprises:

a. about 1-20% by weight of calcium silicate;

b. about 0.1-20% by weight of PVP30K;

c. about 0.01-5% by weight of poloxamer 188;

d. about 0.5-20% by weight of sodium croscarmellose;

e. about 1-90% by weight of microcrystalline cellulose 112;

f. about 1-90% by weight of lactose monohydrate;

g. about 0.01-0.5% by weight of sodium saccharine; and

h. about 0.1-10% by weight of glycerol dibehenate.

111. The method of claim 110, wherein the dispersible tablet comprises:

a. about 5% by weight of calcium silicate;

b. about 1% by weight of PVP30K;

c. about 2% by weight of poloxamer 188;

d. about 5% by weight of sodium croscarmellose;

e. about 1.5% by weight of microcrystalline cellulose 112;

f. about 47.8% by weight of lactose monohydrate;

g. about 0.2% by weight of sodium saccharine; and

h. about 4% by weight of glycerol dibehenate.

112. The method of any one of claims 1-111, wherein the compound is administered to the subject in an amount of from about 1,600 mg to about 2,000 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 1,600 mg to about 2,000 mg.

113. The method of claim 112, wherein the compound is administered to the subject in an amount of from about 1,650 mg to about 1,950 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 1,650 mg to about 1,950 mg.

114. The method of claim 113, wherein the compound is administered to the subject in an amount of from about 1,700 mg to about 1,900 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 1,700 mg to about 1,900 mg.

115. The method of claim 114, wherein the compound is administered to the subject in an amount of from about 1,750 mg to about 1,850 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 1,750 mg to about 1,850 mg.

116. The method of claim 115, wherein the compound is administered to the subject in an amount of about 1,800 mg per dose, optionally wherein the compound is administered to the subject in a single dose of about 1,800 mg.

117. The method of any one of claims 1-116, wherein the compound is administered to the subject in one or more doses totaling from about 1,600 mg to about 2,000 mg.

118. The method of claim 117, wherein the compound is administered to the subject in one or more doses totaling from about 1,650 mg to about 1,950 mg.

119. The method of claim 118, wherein the compound is administered to the subject in one or more doses totaling from about 1,700 mg to about 1,900 mg.

~~120. The method of claim 119, wherein the compound is administered to the subject in one or more doses totaling from about 1,750 mg to about 1,850 mg.~~

~~121. The method of claim 120, wherein the compound is administered to the subject in one or more doses totaling about 1,800 mg.~~

~~122. The method of any one of claims 1-111, wherein the compound is administered to the subject in an amount of from about 1,900 mg to about 2,300 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 1,900 mg to about 2,300 mg.~~

~~123. The method of claim 122, wherein the compound is administered to the subject in an amount of from about 1,950 mg to about 2,250 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 1,950 mg to about 2,250 mg.~~

~~124. The method of claim 123, wherein the compound is administered to the subject in an amount of from about 2,000 mg to about 2,200 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 2,000 mg to about 2,200 mg.~~

~~125. The method of claim 124, wherein the compound is administered to the subject in an amount of from about 2,050 mg to about 2,150 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 2,050 mg to about 2,150 mg.~~

~~126. The method of claim 125, wherein the compound is administered to the subject in an amount of about 2,100 mg per dose, optionally wherein the compound is administered to the subject in a single dose of about 2,100 mg.~~

~~127. The method of any one of claims 1-111 and 122-126, wherein the compound is administered to the subject in one or more doses totaling from about 1,900 mg to about 2,300 mg.~~

~~128. The method of claim 127, wherein the compound is administered to the subject in one or more doses totaling from about 1,950 mg to about 2,250 mg.~~

~~129. The method of claim 128, wherein the compound is administered to the subject in one or more doses totaling from about 2,000 mg to about 2,200 mg.~~

~~130. The method of claim 129, wherein the compound is administered to the subject in one or more doses totaling from about 2,050 mg to about 2,150 mg.~~

~~131. The method of claim 130, wherein the compound is administered to the subject in one or more doses totaling about 2,100 mg.~~

~~132. The method of any one of claims 1-111, wherein the compound is administered to the subject in an amount of from about 2,200 mg to about 2,600 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 2,200 mg to about 2,600 mg.~~

~~133. The method of claim 132, wherein the compound is administered to the subject in an amount of from about 2,250 mg to about 2,550 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 2,250 mg to about 2,550 mg.~~

~~134. The method of claim 133, wherein the compound is administered to the subject in an amount of from about 2,300 mg to about 2,500 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 2,300 mg to about 2,500 mg.~~

~~135. The method of claim 134, wherein the compound is administered to the subject in an amount of from about 2,350 mg to about 2,450 mg per dose, optionally wherein the compound is administered to the subject in a single dose of from about 2,350 mg to about 2,450 mg.~~

~~136. The method of claim 135, wherein the compound is administered to the subject in an amount of about 2,400 mg per dose, optionally wherein the compound is administered to the subject in a single dose of about 2,400 mg.~~

~~137. The method of any one of claims 1-111 and 132-136, wherein the compound is administered to the subject in one or more doses totaling from about 2,200 mg to about 2,600 mg.~~

~~138. The method of claim 137, wherein the compound is administered to the subject in one or more doses totaling from about 2,250 mg to about 2,550 mg.~~

~~139. The method of claim 138, wherein the compound is administered to the subject in one or more doses totaling from about 2,300 mg to about 2,500 mg.~~

~~140. The method of claim 139, wherein the compound is administered to the subject in one or more doses totaling from about 2,350 mg to about 2,450 mg.~~

~~141. The method of claim 140, wherein the compound is administered to the subject in one or more doses totaling about 2,400 mg.~~

~~142. The method of any one of claims 1-141, wherein the subject exhibits a reduction in the frequency of uterine contractions following administration of the compound to the subject.~~

~~143. The method of claim 142, wherein the reduction is from about 1% to about 20% relative to a measurement of the frequency of uterine contractions in the subject recorded prior to administration of the compound to the subject.~~

144. The method of any one of claims 1-143, wherein the subject has been determined to exhibit a serum progesterone (P4) concentration of less than 320 nM prior to the transfer of the one or more embryos to the subject, optionally wherein the subject has been determined to exhibit a serum P4 concentration of less than about 320 nM within 24 hours prior to the transfer of the one or more embryos to the subject.

145. The method of claim 144, wherein the subject has been determined to exhibit a serum P4 concentration of from 200 nM to 300 nM prior to the transfer of the one or more embryos to the subject, optionally wherein the subject has been determined to exhibit a serum P4 concentration of from about 200 nM to about 300 nM within 24 hours prior to the transfer of the one or more embryos to the subject.

146. The method of any one of claims 1-145, wherein the subject has been determined to exhibit a serum P4 concentration of less than 2.0 ng/ml (e.g., a serum P4 concentration of 1.54 ng/ml or less) prior to the transfer of the one or more embryos to the subject, optionally wherein the subject has been determined to exhibit a serum P4 concentration of less than 2.0 ng/ml from about 1 day to about 7 days prior to the transfer of the one or more embryos to the subject.

147. The method of claim 146, wherein the subject has been determined to exhibit a serum P4 concentration of less than 2.0 ng/ml (e.g., a serum P4 concentration of 1.54 ng/ml or less) about 2 days prior to the transfer of the one or more embryos to the subject.

148. The method of claim 146, wherein the subject has been determined to exhibit a serum P4 concentration of less than 2.0 ng/ml (e.g., a serum P4 concentration of 1.54 ng/ml or less) about 3 days prior to the transfer of the one or more embryos to the subject.

149. The method of claim 146, wherein the subject has been determined to exhibit a serum P4 concentration of less than 2.0 ng/ml (e.g., a serum P4 concentration of 1.54 ng/ml or less) about 4 days prior to the transfer of the one or more embryos to the subject.

150. The method of claim 146, wherein the subject has been determined to exhibit a serum P4 concentration of less than 2.0 ng/ml (e.g., a serum P4 concentration of 1.54 ng/ml or less) about 5 days prior to the transfer of the one or more embryos to the subject.

151. The method of any one of claims 146-150, wherein the subject has been determined to exhibit the serum P4 concentration on the day of isolation of one or more oocytes or ova from the subject.

152. The method of claim 151, wherein the subject has been determined to exhibit the serum P4 concentration within about 48 hours of administering hCG to the subject (e.g., so as to induce final follicular maturation).

153. The method of claim 146, wherein the subject has been determined to exhibit a serum P4 concentration of less than 1.5 ng/ml prior to the transfer of the one or more embryos to the subject, optionally wherein the subject has been determined to exhibit a serum P4 concentration of less than 1.5 ng/ml from about 1 day to about 7 days prior to the transfer of the one or more embryos to the subject.

154. The method of claim 153, wherein the subject has been determined to exhibit a serum P4 concentration of less than 1.5 ng/ml about 2 days prior to the transfer of the one or more embryos to the subject.

155. The method of claim 153, wherein the subject has been determined to exhibit a serum P4 concentration of less than 1.5 ng/ml about 3 days prior to the transfer of the one or more embryos to the subject.

156. The method of claim 153, wherein the subject has been determined to exhibit a serum P4 concentration of less than 1.5 ng/ml about 4 days prior to the transfer of the one or more embryos to the subject.

157. The method of claim 153, wherein the subject has been determined to exhibit a serum P4 concentration of less than 1.5 ng/ml about 5 days prior to the transfer of the one or more embryos to the subject.

158. The method of any one of claims 153-157 wherein the subject has been determined to exhibit the serum P4 concentration on the day of isolation of one or more oocytes or ova from the subject.

159. The method of claim 158, wherein the subject has been determined to exhibit the serum P4 concentration within about 48 hours of administering hCG to the subject.

160. The method of any one of claims 1-159, wherein the subject exhibits an increase in endometrial prostaglandin F2α (PGF2α) expression following administration of the compound to the subject.

161. The method of any one of claims 1-160, wherein the subject exhibits a reduction in PGF2α signaling following administration of the compound to the subject.

162. The method of any one of claims 1-161, wherein the subject exhibits an increase in endometrial prostaglandin E2 (PGE2) expression following administration of the compound to the subject.

163. The method of any one of claims 1-162, wherein the subject sustains pregnancy for at least about 14 days following the transfer of the one or more embryos to the subject.

164. The method of claim 163, wherein the subject sustains pregnancy for at least about 6 weeks following the transfer of the one or more embryos to the subject.

165. The method of claim 164, wherein the subject sustains pregnancy for at least about 10 weeks following retrieval of one or more oocytes or ova from the subject.

166. The method of any one of claims 163-165, wherein pregnancy is assessed by a blood pregnancy test.

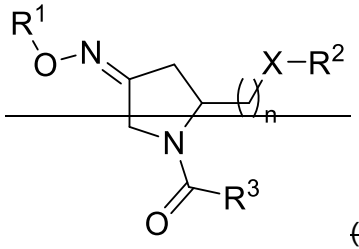
167. The method of claim 166, wherein the blood pregnancy test comprises detecting hCG in a blood sample isolated from the subject.

168. The method of claim 164 or 165, wherein pregnancy is assessed by detecting intrauterine embryo heartbeat.

169. The method of any one of claims 1-168, wherein the subject sustains pregnancy and exhibits a live birth following administration of the compound to the subject.

170. The method of claim 169, wherein the subject exhibits the live birth at a gestational age of at least about 24 weeks.

171. A kit comprising a package insert and a compound represented by formula (I)



(I)

or a geometric isomer, enantiomer, diastereomer, racemate, or salt thereof, wherein

n is an integer from 1 to 3;

R^1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, heteroaryl, C_1-C_6 alkyl heteroaryl, C_2-C_6 alkenyl, C_2-C_6 alkenyl aryl, C_2-C_6 alkenyl heteroaryl, C_2-C_6 alkynyl, C_2-C_6 alkynyl aryl, C_2-C_6 alkynyl heteroaryl, C_3-C_6 cycloalkyl, heterocycloalkyl, C_1-C_6 alkyl cycloalkyl, C_1-C_6 alkyl heterocycloalkyl, C_1-C_6 alkyl carboxy, acyl, C_1-C_6 alkyl acyl, C_1-C_6 alkyl acyloxy, C_1-C_6 alkyl alkoxy, alkoxycarbonyl, C_1-C_6 alkyl alkoxycarbonyl, aminocarbonyl, C_1-C_6 alkyl aminocarbonyl, C_1-C_6 alkyl acylamino, C_1-C_6 alkyl ureido, amino, C_1-C_6 alkyl amino, sulfonyloxy, C_1-C_6 alkyl sulfonyloxy, sulfonyl, C_1-C_6 alkyl sulfonyl, sulfinyl, C_1-C_6 alkyl sulfinyl, C_1-C_6 alkyl sulfanyl, and C_1-C_6 alkyl sulfonylamino;

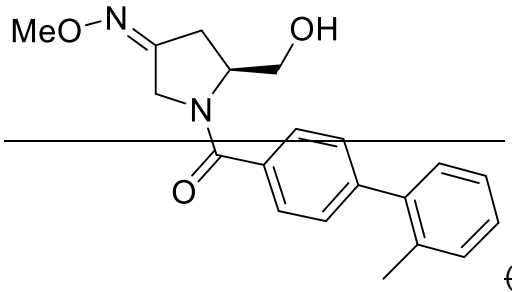
R^3 is selected from the group consisting of aryl and heteroaryl;

X is selected from the group consisting of oxygen and NR^4; and

R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring;

wherein the package insert instructs a user of the kit to perform the method of any one of claims 1-170.

172. The kit of claim 171, wherein the compound is represented by formula (**II**)



(**II**).

173. The kit of claim 171 or 172, wherein the compound is formulated for oral administration to the subject.

174. The kit of claim 173, wherein the compound is formulated as a tablet, capsule, gel cap, powder, liquid solution, or liquid suspension.

175. The kit of claim 174, wherein the compound is formulated as a tablet.

176. The kit of claim 175, wherein the tablet is a dispersible tablet.

177. The kit of any one of claims 171-176, wherein the compound is formulated in a unit dosage form comprising about 50 mg of the compound.

178. The kit of any one of claims 171-176, wherein the compound is formulated in a unit dosage form comprising about 200 mg of the compound.

179. The kit of any one of claims 171-178, wherein the kit comprises from about 1,600 mg to about 2,000 mg of the compound.

180. The kit of claim 179, wherein the kit comprises from about 1,650 mg to about 1,950 mg of the compound.

181. The kit of claim 180, wherein the kit comprises from about 1,700 mg to about 1,900 mg of the compound.

~~182. The kit of claim 181, wherein the kit comprises from about 1,750 mg to about 1,850 mg of the compound.~~

~~183. The kit of claim 182, wherein the kit comprises about 1,800 mg of the compound.~~

~~184. The kit of any one of claims 171-178, wherein the kit comprises from about 1,900 mg to about 2,300 mg of the compound.~~

~~185. The kit of claim 184, wherein the kit comprises from about 1,950 mg to about 2,250 mg of the compound.~~

~~186. The kit of claim 185, wherein the kit comprises from about 2,000 mg to about 2,200 mg of the compound.~~

~~187. The kit of claim 186, wherein the kit comprises from about 2,050 mg to about 2,150 mg of the compound.~~

~~188. The kit of claim 187, wherein the kit comprises about 2,100 mg of the compound.~~

~~189. The kit of any one of claims 171-178, wherein the kit comprises from about 2,200 mg to about 2,600 mg of the compound.~~

~~190. The kit of claim 189, wherein the kit comprises from about 2,250 mg to about 2,550 mg of the compound.~~

~~191. The kit of claim 190, wherein the kit comprises from about 2,300 mg to about 2,500 mg of the compound.~~

~~192. The kit of claim 191, wherein the kit comprises from about 2,350 mg to about 2,450 mg of the compound.~~

~~193. The kit of claim 192, wherein the kit comprises about 2,400 mg of the compound.~~