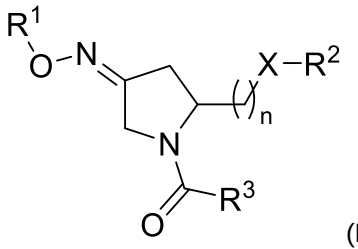
CLAIMS

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;

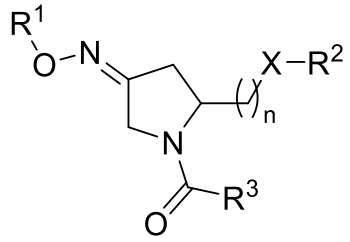
X is selected from the group consisting of oxygen and NR^4; and

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

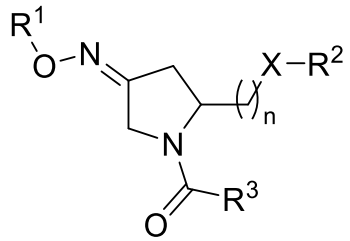
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

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

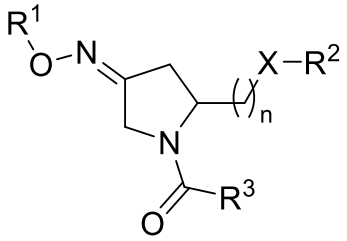
R^4 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkyl aryl, C_1-C_6 alkyl heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

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;

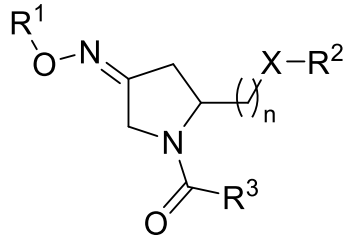
X is selected from the group consisting of oxygen and NR^4; and

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

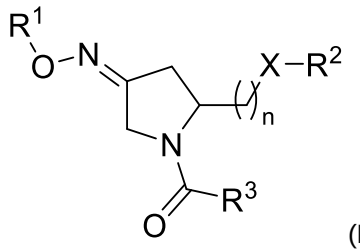
heteroaryl, aryl, and heteroaryl, wherein R^2 and R^4, together with the nitrogen to which they are bound, can form a 5-8 membered saturated or unsaturated heterocycloalkyl ring,

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.