Claims

1. A non-therapeutic method of improving pregnancy rates in non-human females prior to implantation of an embryo or prior to insemination, comprising administering a composition consisting of IL-12 and GM-CSF as active ingredients into a recipient's vagina.

2. A method according to claim 1 wherein the IL-12 is either IL-12 p40 or IL- 12p70.

3. A method according to either preceding claim wherein the composition is in the form of a vaginal insert or an intra-uterine device.

4. A method according to any preceding claim wherein IL-12 and GM-CSF are released *in situ* either above or within the approximate physiological range as those found in seminal fluid.

5. A method according to any preceding claim wherein IL-12 and GM-CSF are recombinant.

6. A method according to any one of claims 3 to 5 wherein the vaginal insert is a vaginal capsule, vaginal gel, vaginal tablet, vaginal powder, vaginal solution, vaginal pessary, vaginal cup, vaginal sponge, vaginal aerosol or vaginal foam or spray.

7. A method according to any preceding claim, wherein the composition further includes an adjuvant, excipient or carrier.

8. A method according to any preceding claim for rapid delivery, controlled delivery, continuous delivery or pulsed delivery.

9. A method according to any preceding claim for improving pregnancy rates in a rodent.

10. A method according to claim 9 wherein the rodent is a rat or mouse.

11. A method according to any preceding claim for promoting uterine receptivity.

12. A method according to claim 11 for promoting uterine receptivity in a rodent.

13. A method according to claim 12 wherein the rodent is a mouse or rat.

14. A pessary for transmucosal vaginal delivery of IL-12 and GM-CSF as active ingredients in a non-therapeutic method of improving pregnancy rates.

15. A pessary according to claim 14 for promoting uterine receptivity in a rodent.

16. A pessary according to claim 10 wherein the rodent is a mouse or rat.

17. A non-therapeutic method of reducing maternal alloreactivity in a non-human mammalian female against seminal fluid/sperm or embryos, comprising exposing vaginal mucosa to a composition consisting of IL-12 and GM-CSF as active ingredients according to any of claims 1 to 13 or the pessary of claims 14 to 16, the method comprising:

(i) introducing at least one vaginal delivery vehicle comprising the composition consisting of IL-12 and GM-CSF as active ingredients according to any of claims 1 to 13 or the pessary of claims 14 to 16, into the vagina of the female;

(ii) optionally inserting further vaginal delivery vehicle(s) as necessary;

(iii) allowing a sufficient period of time to elapse to allow the active components of the vaginal delivery vehicle to be released and to penetrate into the vagina and be absorbed transmucosally and/or diffuse and/or be transported into the uterus; and

(iv) inseminating the female by either mating with a male or by artificial insemination, donor gametes or by means wherein an embryo or other allograft is to be introduced into the uterus for implantation.

18. A non-therapeutic method of improving pregnancy rates or outcome in a non-human mammalian female prior to insemination or implantation of an embryo comprising exposing vaginal mucosa to the composition consisting of IL-12 and GM-CSF as active ingredients according to any of claims 1 to 13 or the pessary of claims 14 to 16, the method comprising:

(i) introducing at least one vaginal delivery vehicle comprising the composition consisting of IL-12 and GM-CSF as active ingredients according to any of claims 1 to 13 or the pessary of claims 14 to 16, into the vagina of the female;

(ii) optionally inserting further vaginal delivery vehicle(s) as necessary;

(iii) allowing a sufficient period of time to elapse to allow the active components of the vaginal delivery vehicle to be released and to penetrate into the vagina and be absorbed transmucosally and/or diffuse and/or be transported into the uterus; and

(iv) inseminating the female by either mating with a male or by

artificial insemination, donor gametes or by means wherein an embryo or other allograft is to be introduced into the uterus for implantation.

19. A kit of parts comprising a number of vaginal delivery vehicles containing the composition of any of claims 1 to 13 or the pessary of claims 14 to 16 and an apparatus for inserting said vaginal delivery vehicles into the vagina of the recipient non-human female and optionally a set of written instructions therefore.