tattoo on the body; and maintaining contact with skin or hair for an extended period of time, such as with moisturizing or regenerative agents overnight. The substance could also serve for offering an extended efficacy of insect repellents, allowing limited need for re-dosing and thereby reducing the overall exposure to the repellent. Alternatively, the substance could serve as an inert protective layer to be applied on the skin before using a mosquito or other insect repellent, maintaining the efficacy of the repellent while protecting the skin or any other mucosa from the toxicity or other effects of the repellant.

SUMMARY

The present disclosure relates to compositions and methods for separating the different aspects of the uterine cavity, or other body cavities or tissues, typically for a controlled period of time, as for example 2-4 weeks, after surgery and for preventing post-surgical scarring. In the uterus, this ultimately prevents the classical complications, including uterine synechiae, and the ensuing infertility. Other than the uterus, this prevents similar complications inherent to the particular site of surgery.

In one aspect, there is provided use of a phase shifting formulation in the manufacture of a composition for use in preventing post-surgical scarring and/or other adhesions, wherein the composition is to be placed on a post-surgical tissue surface to keep local tissues separated while allowing healing, wherein the phase shifting formulation comprises a suitable gel-forming polymer capable of undergoing a descrease in viscosity or liquefaction upon exposure to a trigger, thereby causing the formulation to lose viscosity, the trigger being selected from a change in salt concentrations, an exothermic or endothermic reaction, a direct change in temperature, a change in pH, a physical disruption, a displacement from the tissue, or a passage of time.

In another aspect, there is provided use of a phase shifting formulation in the manufacture of a composition for use in minimizing or preventing infection or inflammation, or for use during a cosmetic procedure, or for use in protecting a patient's burns, or for use in protecting a wound from infection or from further damage pending medical attention, or for use in maintaining a skin graft in place, wherein use of a phase shifting formulation in the manufacture of a composition for use in minimizing or preventing infection or inflammation, or for use during a cosmetic procedure, or for use in protecting a patient's burns, or for use in protecting a wound from infection or from further damage pending medical attention, or for use in maintaining a skin graft in place, wherein the phase shifting formulation comprises a suitable gel-forming polymer capable of undergoing a decrease in viscosity or liquefaction upon exposure to a trigger, thereby causing the formulation to lose viscosity, the trigger being selected from a change in salt concentrations, an exothermic or endothermic reaction, a direct change in temperature, a change in pH, a physical disruption, a displacement from the tissue, or a passage of time.
In yet another aspect, there is provided use of a phase shifting formulation in the manufacture of a composition for use in facilitating diagnosis of damage or developing lesions in or near a joint of the patient, wherein use of a phase shifting formulation in the manufacture of a composition for use in facilitating diagnosis of damage or developing lesions in or near a joint of the patient, wherein the phase shifting formulation comprises a suitable gel-forming polymer capable of undergoing a decrease in viscosity or liquefaction upon exposure to a trigger, thereby causing the formulation to lose viscosity, the trigger being selected from a change in salt concentrations, an exothermic or endothermic reaction, a direct change in temperature, a change in pH, a physical disruption, a displacement from the tissue, or a passage of time.

The composition of the present disclosure is to be applied after surgery, such as uterine surgery. The composition will consist as a gel or a semi-solid substance that will keep the uterine wall separated for a controlled period of time set to match the time needed so that the normal lining develops while scarring is prevented after surgery. The composition uses phase-shifting properties adapted for the specific needs encountered after the particular surgery. After uterine surgery, for example, about 2-20 ml of the composition will be applied at the end of the surgical procedures (quantity depending on uterine size and the nature of surgery performed), using a catheter. The composition will retain its ability to keep the uterine tissues separated,

CLAIMS

What is claimed is:

1. Use of a phase shifting formulation in the manufacture of a composition for use in preventing post-surgical scarring and/or other adhesions, wherein the composition is to be placed on a post-surgical tissue surface to keep local tissues separated while allowing healing, wherein the phase shifting formulation comprises a suitable gel-forming polymer capable of undergoing a decrease in viscosity or liquefaction upon exposure to a trigger, thereby causing the formulation to lose viscosity, the trigger being selected from a change in salt concentrations, an exothermic or endothermic reaction, a direct change in temperature, a change in pH, a physical disruption, a displacement from the tissue, or a passage of time.
2. The use of claim 1, wherein the phase shifting formulation has the form of a gel, and wherein the formulation liquefies in response to the trigger.

3. The use of claim 1 or 2, wherein the gel-forming polymer is selected from a cellulose, a carbomer, gelatin, agar, pectin, a starch, high molecular weight polyethylene glycol, a poloxamer, and a colloidal clay.

4. The use of any one of claims 1 to 3, wherein the phase shifting formulation further comprises a treating agent or tissue regeneration stimulating agent to promote healing and/or regeneration.

5. The use of claim 4, wherein the treating agent or tissue regeneration stimulating agent is selected from endometrial cells with stem-cell like pluri-potent properties; a glycoprotein; a protein; a peptide; a sex hormone; an anti-hormone; a selective estrogen and progestin receptor modulator; a nitrate; a beta-agonist; a beta-antagonist; an opioid; an opioid-antagonist; an antidepressant; a HMG CoA reductase inhibitor; an antihistamine; an ACE inhibitor; a prostaglandin; a semisynthetic or synthetic derivative of a natural prostaglandin; a non-steroidal anti-inflammatory drug (NSAID); an anti-infective; an anesthetic; an immune system modifier; a muscarinic agonist; a muscarinic antagonist; an anti-neoplastic agent; vitamin K; ondansetron; levocarnitine; an anti-fungal; carbamide peroxide; a dopamine antagonist; a bisphosphonate; nicotine; an anti-virals agent; an anti-diabetagenic; insulin; an

anti-Parkinson agent; a low molecular weight heparin; an antimicrobial; an anti-cancer agent; and an anti-infective compound;

wherein the treating agent or tissue regeneration stimulating agent is optionally selected from follicle-stimulating hormone (FSH), luteinizing hormone (LH), human chorionic gonadotropin (HCG), thyroid-stimulating hormone (TSH), GnRH (agonist and antagonist), desmopressin, oxytocin analogs, insulin analogs, TRH analogs, somatostatin analogs, tissue plaminogen activator (TPA), growth hormone releasing hormone (GHRH), corticotropin-releasing hormone analogs (CRH analogs), estradiol, testosterone, progesterone, tamoxifen, mifepristone, raloxifene, nitroglycerin, isosorbide, erythrityl tetranitrate, pentaerythritol tetranitrate, terbutaline, albuterol, pirbuterol, bitolterol, ritodrine, propranolol, metoprolol, nadolol, atenolol, timolol, esmolol, pindolol, acebutolol, labetalol, morphine, hydromorphone, oxymorphone, codeine, hydrocodone, oxycodone, levorphanol, levallorphan, buprenorphine, fentanyl, nalbuphine, butorphanol, pentazocine, naloxone, nalmefene, amitriptyline, amoxapine, desipramine, doxepin, imipramine, maprotilen, nortriptyline, protripyline, trimipramine, fluoxetine, trazodone, lovastatin, mevastatin, simvastatin, pravastatin, atorvastatin, loratadine, chlorpheniramine maleate, brompheniramine maleate, diphenhydramine, dimenhydrinate, carbinoxamine, promethazine, tripelannamine, captopril, enalapril, Lisinopril, prostaglandin E_2 ("PGE_2"), PGE_1, PGA_1, PGB_1, $PGF_{1\alpha}$, 19-hydroxy-PGA_1, 19-hydroxy-PGB_1, PGA_2, PGB_2, 19-hydroxy-PGA_2, 19-hydroxy-PGB_2, PGE_3, $PGF_{3\alpha}$, mioprostol, carboprost trometharnine, dinoprost tromethamine, dinoprostone, lipoprost, gemeprost, metenoprost, sulprostone,tiaprost; diclofenac, etodolac, fenoprofen, lurbiprofen, ibuprofen, indomethacin, ketoprofen, ketorolac, meclofenamate, fenamic acid, meloxicam, nabumetone, naproxin, oxaprozin, piroxicam, sulindac, tolmetin, lidocaine, cocaine, chloroprocaine, tetracaine, prilocaine, mepivacaine, buipivacaine, levobupivacaine, articaine, ropivacaine, phenol, benzocaine, pramoxine, dyclonine, etidocaine, procaine, proparacaine, dibucaine, pramoxine, imiquimod, bethanecol oxybutinyn, melphalan, fluorouracil, a vinca alkaloid, bleomycin, cisplatin, vitamin K, ondansetron, levocarnitine, carbamide peroxide, bromocriptine, a bisphosphonate, nicotine, acyclovir, metformin, octreatide, desmopressin, GNRH, insulin, levodopa, metronidazole; a heavy metal, a salt, and a radio-active substance.

6. The use of any one of claims 1 to 5, wherein the phase shifting formulation is to be applied to a patient's uterus, to a patient's fallopian tubes, to a patient's colon, to a patient's urethra, to a patient's bladder or to a patient's skin graft.

7. The useof any one of claims 1 to 6, wherein the phase shifting formulation is to be applied to the uterine cavity after surgery that involves the uterine cavity.

8. The use of any one of claims 1 to 7, wherein the phase shifting formulation is to be removed by the trigger, which causes the formulation to lose its integrity to facilitate removal from the body cavity or tissue surface.

9. The use of claim 6, wherein the phase shifting formulation is to be applied to a patient's uterus after surgery that involves the uterine cavity or is to be applied to a patient's skin graft, and wherein the phase shifting formulation is to be removed by the trigger 10-20 days after surgery.

10. The use of any one of claims 1 to 9, wherein the post-surgical scarring and/or other adhesions are in the uterus after surgery, wherein:

the phase shifting formulation is to be administered to the uterine cavity so as to maintain space between the local tissues and avoid scarring or other adhesions;

the phase shifting formulation is allowed to remain substantially in place in the uterine cavity for a period of time sufficient to allow healing; and

the trigger is to be used to liquefy or remove the gel or semi-solid substance from the uterine cavity atraumatically.

11. The use of any one of claims 1 to 10, wherein the phase shifting formulation is to be injected into the uterus after a therapeutic product has been applied locally in the uterine cavity.

12. The use of any one of claims 1 to 11, wherein the composition maintains an initial viscosity or consistency for a time sufficient to maintain the subject body tissue free from contact with other tissue or objects, wherein the composition is to be implaced to coat or cover the site of the procedure that requires healing; the composition is then allowed to, after a suitable amount of time, reduce in viscosity or consistency over the relatively short period

of time; the reduced viscosity or reduced consistency composition is to be removed or allowed to expulse from the body tissue; and a fresh amount of the composition is to be implaced repeatedly if and as needed until the risk of scarring or adhesions has decreased significantly.

13. Use of a phase shifting formulation in the manufacture of a composition for use in minimizing or preventing infection or inflammation, or for use during a cosmetic procedure, or for use in protecting a patient's burns, or for use in protecting a wound from infection or from further damage pending medical attention, or for use in maintaining a skin graft in place, wherein the phase shifting formulation comprises a suitable gel-forming polymer capable of undergoing a decrease in viscosity or liquefaction upon exposure to a trigger, thereby causing the formulation to lose viscosity, the trigger being selected from a change in salt concentrations, an exothermic or endothermic reaction, a direct change in temperature, a change in pH, a physical disruption, a displacement from the tissue, or a passage of time.

14. Use of a phase shifting formulation in the manufacture of a composition for use in facilitating diagnosis of damage or developing lesions in or near a joint of the patient, wherein the phase shifting formulation comprises a suitable gel-forming polymer capable of undergoing a decrease in viscosity or liquefaction upon exposure to a trigger, thereby causing the formulation to lose viscosity, the trigger being selected from a change in salt concentrations, an exothermic or endothermic reaction, a direct change in temperature, a change in pH, a physical disruption, a displacement from the tissue, or a passage of time.

15. The use of claim 13 or 14, wherein the phase shifting formulation has the form of a gel, and wherein the formulation liquefies in response to the trigger.

16. The use of any one of claims 13 to 15, wherein the gel-forming polymer is selected from a cellulose, a carbomer, gelatin, agar, pectin, a starch, high molecular weight polyethylene glycol, a poloxamer, and a colloidal clay.

17. The use of any one of claims 13 to 16, wherein additional treating agents are either to be applied separately before the phase shifting formulation is to be applied, or are within the composition.