Duka, I., I. Gavras, et al. (2000). "Role of the postsynaptic alpha(2)-adrenergic receptor subtypes in catecholamine-induced vasoconstriction." Gen Pharmacol 34(2):101-106.

Talke, P., E. Lobo, et al. (2003). "Systemically administered alpha2-agonist-induced peripheral vasoconstriction in humans." Anesthesiology 99(1):65-70.

Talke, P. O., E. P. Lobo, et al. (2001). "Clonidine-induced vasoconstriction in awake volunteers." Anesth Analg 93(2):271-276, 271st contents page.

SUMMARY OF THE INVENTION

The present invention provides a method of treating tissue trauma in a subject, comprising topically administering to the tissue area of the subject affected by said trauma a composition comprising a therapeutically effective amount of at least one alpha adrenergic agonist.

In another aspect, present invention provides a method for treating/alleviating the pain or discomfort associated with aesthetic or plastic surgery or cosmetology procedures in a patient in need thereof, which comprises administering to said patient a pharmaceutical composition comprising a therapeutically effective amount of at least one alpha adrenergic agonist.

In another aspect, present invention provides the use of a composition comprising a therapeutically effective amount of at least one alpha adrenergic agonist in the manufacture of a medicament for treating tissue trauma in a subject wherein the medicament is to be topically administered to the tissue area of the subject affected by said trauma.

In another aspect, present invention provides the use of a pharmaceutical composition comprising a therapeutically effective amount of at least one alpha adrenergic agonist in the manufacture of a medicament for treating the discomfort associated with aesthetic or plastic surgery or cosmetology procedures in a patient in need thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows percentage of each group receiving each score for overall healing. Subjects were treated with vehicle or 0.5% oxymetazoline hydrochloride in vehicle at 20 minutes, 4 hours or 8 hours following the trauma.

Figure 2 shows percentage of group receiving each score for epidermal separation. Subjects were treated with vehicle or 0.5% oxymetazoline hydrochloride in vehicle at 20 minutes, 4 hours or 8 hours following the trauma.

Figure 3 shows the percentage of each group receiving each score for epidermal hyperplasia. Subjects were treated with vehicle or 0.5% oxymetazoline hydrochloride in vehicle at 20 minutes, 4 hours or 8 hours following the trauma.

Figure 4 shows the histological sections from vehicle-treated (left) and 8 hr 0.5% oxymetazoline hydrochloride-treated (right) mice; skin collected at 48 hours following injury. ↓ = necrotic epidermis, * shows separation of epidermis with exposed dermis, ↑

What is claimed is:

1. ~~A method of treating tissue trauma in a subject, comprising topically administering to the tissue area of the subject affected by said trauma~~ Use of a composition comprising a therapeutically effective amount of at least one alpha adrenergic agonist in the manufacture of a medicament for treating tissue trauma in a subject wherein the medicament is to be topically administered to the tissue area of the subject affected by said trauma.

2. The ~~method~~ use of claim 1, wherein the tissue trauma is selected from the group consisting of: damage from radiation, wounds, bruising, burns, blisters, excoriations, incisions, excisions, erosions and ulcers.

3. The ~~method~~ use of claim 2, wherein the radiation is solar or ultraviolet radiation.

4. The ~~method~~ use of claim 2, wherein the burn is caused by a chemical, heat, or solar radiation.

5. The ~~method~~ use of claim 2, wherein the burn is severe enough to result in subsequent tissue damage characterized by at least one condition selected from the group consisting of epidermal necrosis, separation of the epidermis from the dermis and adaptive healing response.

6. The ~~method~~ use of claim 2, wherein the ulcer is diabetic or pressure ulcer.

7. The ~~method~~ use of claim 1, wherein the ~~treatment~~ use results in (a) the reduction *of severity, (b) prevention of development, or (c) more rapid reepithelialization and closure of* open wounds, blisters, excoriations, erosions or ulcers.

8. The ~~method~~ use of claim 1, wherein the ~~treatment~~ use results in the prevention or minimized formation of fine line scars, hypertrophic scars and keloids.

9. The ~~method~~ use of claim 1, wherein the ~~treatment~~ use results in the enhancement of the healing of the tissue trauma.

10. The ~~method~~ use of claim 1, wherein the tissue area is selected from the group consisting of corneal epithelium, skin, and mucous membranes.

11. The ~~method~~ use of claim 1, wherein the alpha adrenergic agonist comprises a compound with an imidazoline structure.

12. The ~~method~~ use of claim 11, wherein the compound with the imidazoline structure is selected from the group consisting of oxymetazoline, xylometazoline, tetrahydrazaline, naphazoline, brimonidine, and clonidine; or a pharmaceutically acceptable salt thereof.

13. The ~~method~~ use of claim 12, wherein the compound is oxymetazoline hydrochloride.

14. The ~~method~~ use of claim 1, wherein the alpha adrenergic agonist is selected from the group consisting of oxymetazoline, xylometazoline, tetrahydrozoline, naphazoline, brimonidine, chlonidine, phenylephrine, methoxamine, mephentermine, metaraminol, desglymidodrine, and midodrine; or a pharmaceutically acceptable salt thereof.

15. The ~~method~~ use of claim 14, wherein the pharmaceutically acceptable salts of oxymetazoline, xylometazoline, tetrahydrozoline, naphazoline, brimonidine, chlonidine, phenylephrine, methoxamine, mephentermine, and metaraminol are respectively selected group consisting of oxymetazoline hydrochloride, xylometazoline hydrochloride, tetrahydrozoline hydrochloride, naphazoline hydrochloride, brimonidine tartrate, chlonidine hydrochloride, phenylephrine hydrochloride, methoxamine hydrochloride, mephentermine sulfate, and metaraminol bitartrate.

16. The ~~method~~ use of claim 1, wherein the composition is selected from the group consisting of solutions, gels, lotions, creams, ointments, foams, emulsions, microemulsions, milks, serums, aerosols, sprays, dispersions, microcapsules, vesicles and microparticles thereof.

17. The ~~method~~ use of claim 1, wherein the tissue area is skin, and the topical administration involves rubbing the composition onto the tissue area, applying the

composition to the tissue area through a dermal patch, or injecting the composition into the epidermis via a micro-injector.

18. The ~~method~~ use of claim 1, wherein the composition comprises about 0.01% to about 30% of the alpha adrenergic agonist.

19. The ~~method~~ use of claim 1, wherein the composition further comprises about 50% to about 99.999% of a pharmaceutically acceptable carrier.

20. The ~~method~~ use of claim 1, wherein the alpha adrenergic agonist is the sole active agent in the composition.

21. ~~A method for treating the discomfort associated with aesthetic or plastic surgery or cosmetology procedures in a patient in need thereof, which comprises administering to said patient~~ Use of a pharmaceutical composition comprising a therapeutically effective amount of at least one alpha adrenergic agonist in the manufacture of a medicament for treating the discomfort associated with aesthetic or plastic surgery or cosmetology procedures in a patient in need thereof.

22. The ~~method~~ use according to claim 21, wherein the procedure is selected from dermal filler injections, neurotoxin injections, Botulinum toxin injections, laser procedures, breast augmentations, breast lifts, breast reductions, face lifts and tummy tucks.

23. The ~~method~~ use according to claim 22, wherein the pharmaceutical composition comprises a therapeutically effective amount of at least one alpha adrenergic agonist in combination with an anesthetic.

24. The ~~method~~ use according to claim 21, wherein the alpha adrenergic agonist comprises a compound with an imidazoline structure.

25. The ~~method~~ use of claim 24, wherein the compound with the imidazoline structure is selected from the group consisting of oxymetazoline, xylometazoline, tetrahydrazaline, naphazoline, brimonidine, and clonidine; or a pharmaceutically acceptable salt thereof.

26. The ~~method~~ use of claim 25, wherein the compound is oxymetazoline hydrochloride.

27. The ~~method~~ use of claim 21, wherein the alpha adrenergic agonist is selected from the group consisting of oxymetazoline, xylometazoline, tetrahydrozoline, naphazoline, brimonidine, chlonidine, phenylephrine, methoxamine, mephentermine, metaraminol, desglymidodrine, and midodrine; or a pharmaceutically acceptable salt thereof.

28. The ~~method~~ use of claim 27, wherein the pharmaceutically acceptable salts of oxymetazoline, xylometazoline, tetrahydrozoline, naphazoline, brimonidine, *chlonidine, phenylephrine, methoxamine, mephentermine, and metaraminol are* respectively selected group consisting of oxymetazoline hydrochloride, xylometazoline hydrochloride, tetrahydrozoline hydrochloride, naphazoline hydrochloride, brimonidine tartrate, chlonidine hydrochloride, phenylephrine hydrochloride, methoxamine hydrochloride, mephentermine sulfate, and metaraminol bitartrate.