

Body, F. Travascio, ed., Intech Open, ISBN 978-953-51-2416-0 (2016), accessed November 8, 2019, at <http://dx.doi.org/10.5772/62527>).

[0018] Treatments for diseases/disorders are expensive, difficult to deliver with specificity, and may have deleterious effects at sites distal to the intended site of action. For example, many medicinal compositions, including antibiotics, small molecule therapeutics (e.g., anti-cancer compounds) and biologics (e.g., monoclonal antibody therapeutics) are administered parenterally in a non-targeted fashion and must diffuse or otherwise find their way to the site of the affliction before they are able to provide their therapeutic benefits. This “shotgun approach” to therapy necessarily requires higher dosing and can result in longer periods of therapy and reduced patient compliance than a therapeutic approach which would deliver therapeutic compounds and compositions in a more targeted fashion which would allow for controlled or programmable release at or near the site of the affliction in a human or veterinary animal.

[0019] Thus, there is a need in the art for drug delivery systems – i.e., compositions and methods of use – that will overcome many of these shortcomings in traditional treatments for certain diseases and disorders in humans and veterinary animals. Such advanced drug delivery systems would allow the use of lower doses of medication and more targeted delivery of the medications to the intended sites of action, as well as reducing the therapeutic problems or delays resulting from patient non-compliance. There also is a need for medical devices coated with such compositions which will facilitate more rapid healing and recovery in humans and animals suffering from such diseases and disorders. Finally, there is a need in the art for methods of producing such compositions and medical devices that will meet the needs of the medical and patient communities in maximizing treatment efficacies while reducing costs.

SUMMARY

[0020] The present inventors reasoned that since collagen disruption is associated with a variety of diseases and disorders in humans and other animals, the conjugation of a variety of therapeutic compounds and/or diagnostic compounds to collagen or collagen mimetic peptides

would provide an elegant, rapid and reproducible way of overcoming many of the above-referenced limitations in drug delivery. Thus, the present disclosure provides such drug delivery systems, medical devices and methods of manufacturing the same. Accordingly, the present disclosure meets the needs in the art as expressed hereinabove.

[0021] In one example, the disclosure provides compositions comprising one or more collagen mimetic peptides (CMPs), which in certain examples have been conjugated one or more therapeutic compounds and/or one or more diagnostic compounds thereby forming CMP conjugates and compositions. Such CMPs and CMP conjugates, and compositions comprising such CMPs and/or CMP conjugates, are useful in treating, preventing, ameliorating and diagnosing a variety of diseases, disorders and physical conditions in humans and veterinary animals. In certain examples, the disclosure provides compositions comprising such CMPs and/or CMP conjugates and one or more pharmaceutically acceptable carriers, excipients or compounding agents, and optionally one or more additional therapeutic or diagnostic agents, to provide therapeutic and diagnostic compositions useful in treating, preventing, ameliorating or diagnosing certain diseases and disorders in humans and veterinary animals.

[0021a] In one aspect, the present disclosure provides use of a composition in the manufacture of a medicament for treating a posterior segment ocular disease, disorder or wound, wherein said posterior segment ocular disease, disorder or wound involves the retina, retinal epithelium, retinal blood vessels, retinal nerves or optic nerve in a human or veterinary animal suffering from or predisposed to said ocular disease, disorder or wound, said composition comprising (a) at least one collagen mimetic peptide (CMP) comprising the amino acid sequence of SEQ ID NO: 6, and (b) one or more pharmaceutically suitable carriers.

[0022] In another example, the disclosure provides methods of treating, preventing, ameliorating or diagnosing certain diseases and disorders in humans and veterinary animals, by administering the conjugates and/or compositions of the disclosure to a human or veterinary animal suffering from or predisposed to such diseases or disorders. Diseases and disorders suitably treated, prevented, cured, ameliorated or diagnoses according to this example of the disclosure include ocular diseases or disorders, skin diseases or disorders, cancers, gastrointestinal diseases or disorders, genitourinary tract diseases or disorders, fibrotic diseases or disorders, cardiovascular diseases or disorders, bone diseases or disorders, and rheumatic diseases or disorders.

[0023] In yet another example, the disclosure provides medical devices coated with or comprising one or more of the conjugates or compositions of the disclosure. In related examples, the disclosure provides methods of treating, curing, preventing or ameliorating diseases or disorders in humans or veterinary animals comprising implanting one or more of the medical

WHAT IS CLAIMED IS:

1. Use of a composition in the manufacture of a medicament for treating a posterior segment ocular disease, disorder or wound, wherein said posterior segment ocular disease, disorder or wound involves the retina, retinal epithelium, retinal blood vessels, retinal nerves or optic nerve in a human or veterinary animal suffering from or predisposed to said ocular disease, disorder or wound, said composition comprising (a) at least one collagen mimetic peptide (CMP) comprising the amino acid sequence of SEQ ID NO: 6, and (b) one or more pharmaceutically suitable carriers.
2. The use of claim 1, wherein said at least one CMP is attached to at least one therapeutic compound (TC) to form a CMP-TC conjugate.
3. The use of claim 1 or 2, wherein said posterior segment ocular disease or disorder involves the retinal epithelium.
4. The use of claim 1 or 2, wherein said posterior segment ocular disease or disorder is selected from the group consisting of macular degeneration, retinitis pigmentosa, a retinal tear, retinal detachment, retinopathy, retinal arterial or venous occlusion, optic neuritis, optic neuropathy and optic atrophy.
5. The use of claim 4, wherein said macular degeneration is selected from wet macular degeneration, dry macular degeneration and age-related macular degeneration.
6. The use of claim 4, wherein said retinopathy is diabetic retinopathy.
7. The use of claim 1, wherein said composition is to be administered to the eye conjunctivally or subconjunctivally.

8. The use of claim 7, wherein said subconjunctival administration is achieved by administration of said composition into the subconjunctival fornix.
9. The use of claim 1, wherein said composition is to be administered to the eye in the form of one or more drops of solution or a suspension that contains the composition.
10. The use of claim 1, wherein said composition is to be administered to the eye via injection.
11. The use of claim 1, wherein said composition is to be administered to the eye in the form of a coating on a solid material that is implanted into an eye structure.
12. The use of claim 1, wherein said composition is to be administered to the eye in the form of a wafer, film, gel, mesh or patch.
13. The use of claim 1, wherein said composition is attached to one or more spheres or nanoparticles that are to be delivered to or into an eye structure.