

kD-6 mg/ml; 8 kD-4 mg/ml; 500 kD-0.006 mg/ml; and 2,000 kD-20 mg/ml. The most potent molecule in this assay is 500 kD dextran sulfate.

7.3. Conclusions

Scar formation and fibrosis result from uncontrolled invasion of fibroblasts to the site of an injury or lesion. Other detrimental conditions also result from uncontrolled cell invasion, such as neurite outgrowth, glial cell invasion, and monocyte/macrophage invasion. Inhibition of fibroblast invasion would prevent scarring and associated detrimental effects, such as surgical adhesions, e.g., peridural fibrosis, and cosmetically inappropriate scars, e.g., following cosmetic or reconstructive surgery. The foregoing results indicate that glycosaminoglycans and other anionic polymers inhibit invasion of fibroblasts, as well as other non-neuronal cells such as glial cells, and neurite outgrowth, and thus prevent associated detrimental effects.

The foregoing results also indicate that extent of inhibition correlates with anionic charge density, and that this relationship may be useful in predicting or identifying anionic polymers for use in the practice of the present invention. However, the *in vivo* results show that charge density only in part determines inhibitory potential.

The present invention is not to be limited in scope by the specific embodiments described herein. Indeed, various modifications of the invention in addition to those described herein will become apparent to those skilled in the art from the foregoing description and accompanying figures. Such modifications are intended to fall within the scope of the appended claims.

Various publications are cited herein, the disclosures of which are incorporated by reference in their entireties.

What is claimed is:

1. A composition comprising:

- (a) an amount of dextran sulfate effective in inhibit fibrosis at the site of a lesion in a mammal, in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 2,000,000 Daltons; and
- (b) an amount of an adhesive protein effective to anchor the dextran sulfate at the site of the lesion.

2. The composition of claim 1 in which the dextran sulfate is covalently linked to the adhesive protein.

3. The composition of claim 1 or 2 in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 500,000 Daltons.

4. The composition of claim 1 or 2 in which the adhesive protein is selected from the group consisting of fibrin, mussel polyphenolic adhesion protein, barnacle polyphenolic adhesion protein, oyster polyphenolic adhesion protein, and a chemically polymerized peptide from an adhesion protein.

5. A method for inhibiting fibrosis at a site of a lesion in a mammal comprising administering to a site of a lesion in a mammal a composition comprising an amount of dextran sulfate effective to inhibit fibrosis at the site of administration, in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 2,000,000 Daltons.

6. The method according to claim 5 in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 500,000 Daltons.

7. A method for inhibiting fibrosis at the site of a lesion in a mammal comprising the following steps:

- (a) applying a composition to a site of a lesion in a mammal, which composition comprises (i) an amount

of dextran sulfate effective to inhibit fibrosis at the site of administration, in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 2,000,000 Daltons, and (ii) an amount of an adhesive protein effective to anchor the dextran sulfate at the site of the lesion; and

- (b) allowing the composition to cure at the site of the lesion.

8. The method according to claim 7 in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 500,000 Daltons.

9. The method according to claim 7 in which the lesion is a surgical lesion.

10. The method according to claim 7 in which the lesion results from a traumatic injury.

11. The method according to claim 9 in which the surgical lesion results from a laminectomy, fallopian tube surgery or surgery to treat temporomandibular joint dysfunction.

12. The method according to claim 9 in which the surgical lesion results from abdominal surgery, joint surgery, tendon surgery, surgery to remove pelvic sidewall adhesions, peritoneal surgery, thoracic surgery, vascular surgery, cardiac surgery, heart bypass surgery, heart valve replacement surgery, open heart surgery, or peripheral nerve surgery.

13. A method of inhibiting peridural fibrosis in a mammal following laminectomy, comprising administering a composition comprising an amount of dextran sulfate effective to inhibit peridural fibrosis at the site of administration, to a laminectomy site in a mammal, in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 2,000,000 Daltons.

14. The method according to claim 13 in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 500,000 Daltons.

15. The method according to claim 13 in which the composition further comprises a pharmaceutically acceptable surgical implant, which surgical implant consists essentially of a polymer.

16. An improved implant in which the improvement comprises a coating on the implant, which coating consists of an amount of the composition of claim 1 or 2 effective to inhibit fibrosis in a mammal at a site of administration of the implant.

17. The improved implant of claim 16 in which the polymer implant is selected from the group consisting of nephrostomy tube, peritoneal drainage tube, artificial hip joint, artificial heart valve, and peripheral nerve repair prosthesis.

18. The method according to claim 7 in which the adhesive protein is selected from the group consisting of fibrin, mussel polyphenolic adhesion protein, barnacle polyphenolic adhesion protein, oyster polyphenolic adhesion protein, and a chemically polymerized peptide from an adhesion protein.

19. A composition comprising an amount of dextran sulfate effective to inhibit fibrosis in a mammal, in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 2,000,000 Daltons, and a pharmaceutically acceptable implant, which implant comprises denatured collagen.

20. A composition comprising an amount of dextran sulfate effective to inhibit fibrosis in a mammal, in which the average molecular weight of the dextran sulfate is in the range of about 40,000 to 2,000,000 Daltons, and a pharmaceutically acceptable implant, which implant comprises dextran.

21. A composition comprising (a) a solution in which the concentration of dextran sulfate is in the 2-20 mg/ml, and