[0004] Procedures involving cryoneurolysis that selectively target peripheral nerves without damaging the surrounding tissue and provide sustained treatment of pain would be highly desirable.

SUMMARY

[0005] In one aspect, there is provided use of a biocompatible ice slurry in the manufacture of a medicament for the treatment of pain by providing reversible inhibition of one or more peripheral nerves to a subject in need thereof, wherein the biocompatible slurry is to be injected into or around the peripheral nerves for a duration sufficient to inhibit the peripheral nerves in the subject. The disclosure also provides a method of providing reversible inhibition of peripheral nerves to a subject in need thereof. The use or method comprises providing a biocompatible ice slurry to the peripheral nerves for a duration sufficient to inhibit the peripheral nerves in the subject, wherein the inhibition is reversible. In some embodiments, the inhibition is reversed after about 5 months or less. The peripheral nerves targeted for inhibition can be subcutaneous nerves; somatic nerves, including sensory nerves, motor nerves, cranial nerves or spinal nerves; and autonomic nerves, including sympathetic, parasympathetic or enteric nerves. In some embodiments, the biocompatible ice slurry is provided along the perineural sheath of a peripheral nerve.

[0006] In one embodiment, the biocompatible ice slurry comprises ice particles and a lactated Ringer's solution or a lactated electrolyte solution.

[0007] In another embodiment, the biocompatible ice slurry further comprises hetastarch or dextrose.

[0008] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1% to about 20% glucose.

[0009] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1% to about 20% glycerol.

[0010] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1% to about 6% hetastarch.

[0011] In yet another embodiment, the biocompatible ice slurry comprises ice particles and saline.

[0012] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1% to about 20% glycerol.

[0013] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1 % to about 20% dextrose.

[0014] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1% to about 5% ethanol.

[0015] In yet another embodiment, the biocompatible ice slurry further comprises about 0.1% to about 10% poly vinyl alcohol.

[0016] In yet another embodiment, the biocompatible ice slurry further comprises at least one ion, sugar, polysaccharide, lipid, oil, lysolecithin, amino acid, caffeine, surfactant, anti-metabolite or combinations thereof. The at least one ion includes, but is not limited to, calcium, potassium,

CLAIMS

1. Use of a biocompatible ice slurry in the manufacture of a medicament for the treatment of pain by providing reversible inhibition of one or more peripheral nerves to a subject in need thereof, wherein the biocompatible slurry is to be injected into or around the peripheral nerves for a duration sufficient to inhibit the peripheral nerves in the subject.

2. The use of claim 1, wherein the biocompatible ice slurry comprises ice particles and a lactated Ringer's solution, electrolyte solution or a lactated electrolyte solution.

3. The use of claim 2, wherein the biocompatible ice slurry further comprises hetastarch or dextrose.

4. The use of claim 2, wherein the biocompatible ice slurry further comprises 0.1% to 20% glucose.

5. The use of claim 2, wherein the biocompatible ice slurry further comprises 0.1% to 20% glycerol.

6. The use of claim 2, wherein the biocompatible ice slurry further comprises 0.1% to 6% hetastarch.

7. The use of claim 1, wherein the biocompatible ice slurry comprises ice particles and saline.

8. The use of claim 7, wherein the biocompatible ice slurry further comprises 0.1% to 20% glycerol.

9. The use of claim 7, wherein the biocompatible ice slurry further comprises 0.1 % to 20% dextrose.

10. The use of claim 7, wherein the biocompatible ice slurry further comprises 0.1% to 5% ethanol.

11. The use of claim 7, wherein the biocompatible ice slurry further comprises 0.1% to 10% poly vinyl alcohol.

12. The use of claim 7, wherein the biocompatible ice slurry further comprises at least one sugar, ion, polysaccharide, lipid, oil, lysolecithin, amino acid, caffeine, surfactant, antimetabolite, detergent or a combination thereof.

13. The use of claim 12, wherein the at least one sugar is glucose, mannitol, hetastarch, sucrose, sorbitol or a combination thereof.

14. The use of claim 12, wherein the at least one ion is calcium, potassium, hydrogen, chloride, magnesium, sodium, lactate, phosphate, zinc, sulfur, nitrate, ammonium, carbonate, hydroxide, iron, barium, salts thereof or a combination thereof.

15. The use of claim 12, wherein the at least one oil is canola oil, coconut oil, corn oil, cottonseed oil, flaxseed oil, olive oil, palm oil, peanut oil, safflower oil, soybean oil, sunflower oil or a combination thereof.

16. The use of claim 12, wherein the surfactant is a detergent.

17. The use of claim 12, wherein the detergent is at least one of deoxycholate, sodium tetradecyl sulphate, polidocanol, deoxycholate, sodium tetradecyl sulphate, polidocanol, polysorbate 20 (polyoxyethylen (20) sorbitan monolaurate), polysorbate 40 (polyoxyethylene (20) sorbitan monopalmitate), polysorbate 60 (polyoxyethylene (20) sorbitan monostearate), polysorbate 80 (polyoxyethylene (20) sorbitan monooleate), sorbitan ester, poloxamater or a combination thereof.

18. The use of claim 1, wherein the biocompatible ice slurry comprises a peritoneal dialysis solution.

19. The use of claim 1, wherein the biocompatible ice slurry is to be provided along the perineural sheath of a peripheral nerve.

20. The use of claim 1, wherein the peripheral nerves are subcutaneous nerves.

21. The use of claim 1, wherein the peripheral nerves are autonomic nerves.

22. The use of claim 21, wherein the autonomic nerves are sympathetic nerves, parasympathetic nerves or enteric nerves.

23. The use of claim 1, wherein the peripheral nerves are somatic nerves.