subjects. In yet another embodiment, the subject suffers from ischemic events.

[0014] In an aspect, the disclosure provides the use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating a subject suffering from ischemic injury or an acute ischemic event to reduce ischemic injury. In another aspect, the disclosure provides the use of cysteamine, a cysteamine derivative, cystamine, a cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing in the manufacture of a medicament for treating a subject at risk of thrombosis and ischemic injury resulting therefrom to reduce the risk of ischemic injury resulting from thrombosis. In another aspect, the disclosure provides the use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating a subject at risk of thrombosis to reduce the risk of ischemic injury due to thrombosis. In another aspect, the disclosure provides the use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for increasing the ratio of low molecular weight (LMW) adiponectin levels to medium (MMW) and/or high molecular weight (HMW) adiponectin levels in a subject in need thereof, to increase the ratio of low molecular weight adiponectin levels compared to a baseline prior to contacting the subject with the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof, wherein the subject is not suffering from hypercholesterolemia or type II diabetes. In another aspect, the disclosure provides the use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating a subject having irregular or abnormal ratios of high molecular weight (HMW):medium molecular weight (MMW) adiponectin, HMW:low molecular weight (LMW) adiponectin, or MMW:LMW adiponectin, to improve adiponectin ratios in the subject compared to a subject that did not receive the cysteamine, cysteamine derivative, cystamine,

cystamine derivative or a pharmaceutically acceptable salt thereof. In another aspect, the disclosure provides the use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating an ischemic event in a subject, wherein the subject has improved behavioral outcome compared to a subject that did not receive the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof. In another aspect, the disclosure provides the use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for increasing adiponectin levels in a subject compared to a baseline prior to contacting the subject with the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt of any of the foregoing. In another aspect, tThe disclosure also provides a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof for use in treating ischemia, ischemic injury, an acute ischemic event, thrombosis or ischemic injury resulting from thrombosis. In one embodiment, the ischemia or ischemic injury is the result of a thrombotic disorder. In another embodiment, the thrombotic disorder is sickle cell disease, deep vein thrombosis, pulmonary embolism, hypercoagulable state, thrombophilia, Factor V Leiden, Antithrombin III deficiency, Protein C deficiency, Protein S deficiency, Prothrombin gene mutation (G20210A), Hyperhomcysteinemia, antiphospholipid antibody syndrome (APS), anticardiolipin antibody (ACLA) thrombosis syndrome, or lupus anticoagulant (LA) syndrome. In yet another embodiment, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is cysteamine, a cysteamine derivative, or a pharmaceutically acceptable salt thereof. In yet a further embodiment, the ischemia is caused by a risk factor selected from the group consisting of high blood pressure, tobacco use, carotid or other artery disease, peripheral artery disease, atrial fibrillation, other heart disease, transient ischemic attacks (TIAs), a blood disorders, high blood

cholesterol, physical inactivity, obesity, excessive alcohol use, illegal drug use, a prior stroke, Sickle Cell Anemia and prior heart attack. In another embodiment, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is formulated for intraperitoneal administration. In any of the foregoing embodiments, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is administered intravascularly. In yet a further embodiment of any of the foregong, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is formulated for oral administration. In a further embodiment, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is

enterically coated. In any of the foregoing embodiments the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is administered continuously. In another embodiment, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is administered prior to, simultaneously with or after an ischemic event/crisis. In yet another embodiment, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is used to increase adiponectin levels in the subject.

[0015] The details of one or more embodiments of the disclosure are set forth in the accompanying drawings and the description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE FIGURES

[0016] **Figure 1** shows treatment of adipose tissue explants with 90μM cysteamine for 45 min., 90 min., and 24hrs. Significant difference in total adiponectin with 90 μM cysteamine treatment at 45 min.: p=0.002; significant difference in HMW adiponectin with 90 μM cysteamine treatment at 45 min.: p=0.04; significant difference in HMW adiponectin with 90 μM cysteamine treatment at 90 min.: p=0.02.

[0017] **Figure 2A-C** shows (A) a schematic and relative mobility shift of LMW, MMW and HMW adiponectin; (B) shows Gastric Banding (GB) serum incubated at room temperature, 37°C, 37°C +45μM cysteamine for 1hr and the production of adiponectin multimers. No significant difference between room temperature and 37°C for any multimer was observed. However: HMW significantly decrease with cysteamine treatment: p=0.009; MMW had significant change with cysteamine treatment; and LMW significantly increase with cysteamine treatment: p=0.05. (C) Mean values for BMI, ALT, and AST measured at baseline, after 24 weeks of treatment with EC-cysteamine and then 16 weeks after discontinuing EC-cysteamine). The P values are denoted as not significant (ns), *P < .05, **P < .01. Mean BMI was not significantly different at any timepoints. SEM is shown.

Claims:

1. ~~A method for treating a subject suffering from ischemic injury or an acute ischemic event comprising administering to a subject~~ Use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof ~~in an amount effective~~ in the manufacture of a medicament for treating a subject suffering from ischemic injury or an acute ischemic event to reduce ischemic injury.

2. The ~~method~~ use of claim 1 wherein the ischemic injury is the result of a thrombotic disorder.

3. The use ~~method~~ of claim 2, wherein the thrombotic disorder is sickle cell disease, deep vein thrombosis, pulmonary embolism, cardiac embolism, hypercoagulable state, thrombophilia, Factor V Leiden, Antithrombin III deficiency, Protein C deficiency, Protein S deficiency, Prothrombin gene mutation (G20210A), Hyperhomcysteinemia, antiphospholipid antibody syndrome (APS), anticardiolipin antibody (ACLA) thrombosis syndrome, or lupus anticoagulant (LA) syndrome.

4. The use ~~method~~ of any of claims 1 to 3, wherein the amount of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is effective to reduce the risk of ischemic injury resulting from thrombosis.

5. ~~A method for treating a subject at risk of thrombosis and ischemic injury resulting therefrom comprising administering to the subject an amount~~ Use of cysteamine, a cysteamine derivative, cystamine, a cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing in the manufacture of a medicament for treating a subject at risk of thrombosis and ischemic injury resulting therefrom~~, effective~~ to reduce the risk of ischemic injury resulting from thrombosis.

6. The ~~method~~ use of claim 4 or 5, wherein the subject has cancer, myeloproliferative disorder, multiple myeloma, surgery, trauma, immobilization, oral contraceptive use, administration of thalidomide or its congeners optionally in combination with steroid, heparin-induced thrombocytopenia, pregnancy, inflammatory bowel disease, nephrotic syndrome, paroxysmal nocturnal

hemoglobinuria, hyperviscosity syndrome, or Waldenstrom's macroglobulinemia.

7. ~~A method for treating a subject at risk of thrombosis comprising administering to the subject an amount~~ Use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating a subject at risk of thrombosis ~~in an amount effective~~ to reduce the risk of ischemic injury due to thrombosis.

8. The ~~method~~ use of claim 7, wherein the subject has cancer, myeloproliferative disorder, multiple myeloma, surgery, trauma, immobilization, oral contraceptive use, administration of thalidomide or its congeners optionally in combination with steroid, heparin-induced thrombocytopenia, pregnancy, inflammatory bowel disease, nephrotic syndrome, paroxysmal nocturnal hemoglobinuria, hyperviscosity syndrome, or Waldenstrom's macroglobulinemia.

9. The use ~~method~~ of claims 1 or 7, wherein the ischemic injury is the result of a tissue injury, a disease or a stroke.

10. The use ~~method~~ of claim 9, wherein the injury is a reperfusion injury.

11. The use ~~method~~ of claim 10, wherein the reperfusion injury is a result of surgery or organ transplant.

12. The use ~~method~~ of claim 9, wherein the disease is Sickle Cell Disease.

13. The use ~~method~~ of any one of claims 1 to 12, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is administered within 72 hours after an ischemic event.

14. The use ~~method~~ of any one of claims 1 to 13, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative

or a pharmaceutically acceptable salt thereof is administered continuously after an ischemic event.

15. The use ~~method~~ of any one of claim 1 to 12, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is administered continuously to a subject at risk of an ischemic event.

16. ~~A method of increasing the ratio of low molecular weight (LMW) adiponectin levels to medium (MMW) and/or high molecular weight (HMW) adiponectin levels in a subject in need thereof comprising administering to the subject an amount~~ Use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for increasing the ratio of low molecular weight (LMW) adiponectin levels to medium (MMW) and/or high molecular weight (HMW) adiponectin levels in a subject in need thereof, ~~effective~~ to increase the ratio of low molecular weight adiponectin levels compared to a baseline prior to contacting the subject with the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof, wherein the subject is not suffering from hypercholesterolemia or type II diabetes.

17. ~~A method for treating a subject having irregular or abnormal ratios of high molecular weight (HMW):medium molecular weight (MMW) adiponectin, HMW:low molecular weight (LMW) adiponectin, or MMW:LMW adiponectin, comprising administering to the subject an amount~~ Use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating a subject having irregular or abnormal ratios of high molecular weight (HMW):medium molecular weight (MMW) adiponectin, HMW:low molecular weight (LMW) adiponectin, or MMW:LMW adiponectin, ~~effective~~ to improve adiponectin ratios in the subject compared to a subject that did not receive the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof.

18. The ~~method~~ use of claim 1, 5, 7, 16 or 17, wherein the subject has a risk factor for ischemia selected from the group consisting of high blood pressure, tobacco use, carotid or other artery disease, peripheral artery disease, atrial fibrillation, other heart disease, transient ischemic attacks (TIAs), a blood disorders, high blood cholesterol, physical inactivity, obesity,

excessive alcohol use, illegal drug use, a prior stroke, Sickle Cell Anemia and prior heart attack.

19. The use ~~method~~ of claim 16 or 17, wherein the subject has previously suffered from an ischemic event.

20. The use ~~method~~ of any of the preceding claims, wherein ~~comprising administering~~ cysteamine, a cysteamine derivative or a pharmaceutically acceptable salt thereof is to be administered.

21. The use ~~method~~ of any of the preceding claims, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is to be administered at a concentration in the range of about 0.5-20 mg/kg of body weight of said subject.

22. The use ~~method~~ of any of claims 1-20, wherein the total daily dose of the cysteamine, cysteamine derivative, cystamine, cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is about 0.5-4.0 g/m^2.

23. The use ~~method~~ of any of the preceding claims, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is to be administered orally.

24. The use ~~method~~ of claim 23, wherein the cysteamine, a cysteamine derivative, cystamine or a cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is a delayed or controlled release dosage form.

25. The use ~~method~~ of any of claims 1-22, wherein the cysteamine, a cysteamine derivative, cystamine or a cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is to be administered intraperitoneally.

26. The use ~~method~~ of claim 25, wherein the cysteamine, a cysteamine derivative, cystamine or a cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is to be administered intravenously or intra-arterially.

27. The use ~~method~~ of any one of claims 1 to 26, wherein the ~~administering~~ medicament results in a reduction in ischemia reperfusion injury or inflammation from an ischemic event.

28. The use ~~method~~ of any one of claims 1 to 27, ~~further comprising administering~~wherein the medicament further comprises one or more additional agents useful to treat ischemia.

29. The use ~~method~~ of claim 28, wherein the one or more additional agents is selected from the group consisting of a reperfusion agent, a free-radical scavenger agent, and a spin trap agent, a neuroprotective agent, an anticoagulant, an antiplatelet agent, nimodipine, and naloxone.

30. The use ~~method~~ of any one of claims 1 to 29, ~~further comprising administering~~ wherein the medicament further comprises one or more agents useful to treat a thrombotic disorder, optionally an anticoagulant, heparin, a vitamin K antagonist, 4-hydroxycoumarin derivatives, warfarin, acenocoumarol, dicumarol, ethyl biscoumacetate, phenprocoumon, streptokinase, urokinase, tissue plasminogen activator (tPA), alteplase (recombinant tPA), reteplase, tenecteplase, and argatroban.

31. The use ~~method~~ of any one of claims 23 or 24, wherein the cysteamine, cysteamine derivative, cystamine or cystamine derivative, or a pharmaceutically acceptable salt of any of the foregoing, is to be administered less than four times per day.

32. The use ~~method~~ of any one of claims 31, wherein the cysteamine, cysteamine derivative, cystamine or cystamine is to be administered twice daily.

33. The use ~~method~~ of any of the foregoing claims, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered continuously for a period of days, weeks or months.

34. ~~A method of treating an ischemic event comprising:~~

~~contacting a subject suffering from an ischemic event with an effective amount~~ Use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating an ischemic event in a subject, wherein the subject has improved behavioral outcome compared to a subject that did not receive the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof.

35. The ~~method~~ use of claim 34, wherein the medicament increases the subject's adiponectin levels ~~are increased following contacting with the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof~~.

36. The use ~~method~~ of claim 34 or 35, wherein the total daily dose of the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is about 0.5-4.0 g/m^2.

37. The use ~~method~~ of any of claims 34 to 36, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered intraperitoneally.

38. The use ~~method~~ of any of claims 34 to 37, wherein cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered orally.

39. The use ~~method~~ of any of claims 34 to 38, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is a delayed or controlled release dosage form that provides increased delivery of the

cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof to the small intestine.

40. The use ~~method~~ of claim 39, wherein the delayed or controlled release dosage form comprises an enteric coating that releases the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof when the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof reaches the small intestine or a region of the gastrointestinal tract of a subject in which the pH is greater than about pH 4.5.

41. The use ~~method~~ of claim 42, wherein the enteric coating is a coating selected from the group consisting of polymerized gelatin, shellac, methacrylic acid copolymer type C NF, cellulose butyrate phthalate, cellulose hydrogen phthalate, cellulose proprionate phthalate, polyvinyl acetate phthalate (PVAP), cellulose acetate phthalate (CAP), cellulose acetate trimellitate (CAT), hydroxypropyl methylcellulose phthalate, hydroxypropyl methylcellulose acetate, dioxypropyl methylcellulose succinate, carboxymethyl ethylcellulose (CMEC), hydroxypropyl methylcellulose acetate succinate (HPMCAS) , and acrylic acid polymers and copolymers, typically formed from methyl acrylate, ethyl acrylate, methyl methacrylate and/or ethyl methacrylate with copolymers of acrylic and methacrylic acid esters.

42. The use ~~method~~ of any of the foregoing claims, wherein when the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered orally, the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered with a bioavailable iron formulation.

43. The use ~~method~~ of any of the foregoing claims, wherein the ~~administering~~ medicament results in a reduction in inflammation from the ischemic event.

44. The use ~~method~~ of claim 18, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered chronically.

45. The use ~~method~~ of claim 1, 5, 7, 16 or 17, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered acutely.

46. ~~A method of increasing adiponectin levels in a subject comprising contact the subject with an effective amount~~ Use of a cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for increasing adiponectin levels in a subject~~to increase adiponectin levels~~ compared to a baseline prior to contacting the subject with the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt of any of the foregoing.

47. The ~~method~~ use of claim 46, wherein the total adiponectin levels are increased.

48. The use ~~method~~ of claim 46, wherein the ratio of lower molecular weight adiponectin is increased.

49. The use ~~method~~ of claim 48, wherein the subject is obese and has low LMW adiponectin levels compared to healthy subjects.

50. The use ~~method~~ of claim 48, wherein the subject has diabetes and has low LMW adiponectin levels compared to healthy subjects.

51. The use ~~method~~ of claim 46, wherein the subject suffers from ischemic events.

52. A cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof for use in

treating ischemia, ischemic injury, an acute ischemic event, thrombosis or ischemic injury resulting from thrombosis.

53. The use of claim 53, wherein the ischemia or ischemic injury is the result of a thrombotic disorder.

54. The use of claim 53, wherein the thrombotic disorder is sickle cell disease, deep vein thrombosis, pulmonary embolism, hypercoagulable state, thrombophilia, Factor V Leiden, Antithrombin III deficiency, Protein C deficiency, Protein S deficiency, Prothrombin gene mutation (G20210A), Hyperhomcysteinemia, antiphospholipid antibody syndrome (APS), anticardiolipin antibody (ACLA) thrombosis syndrome, or lupus anticoagulant (LA) syndrome.

55. The use of claim 53, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is cysteamine, a cysteamine derivative, or a pharmaceutically acceptable salt thereof.

56. The use of claim 52, wherein the ischemia is caused by a risk factor selected from the group consisting of high blood pressure, tobacco use, carotid or other artery disease, peripheral artery disease, atrial fibrillation, other heart disease, transient ischemic attacks (TIAs), a blood disorders, high blood cholesterol, physical inactivity, obesity, excessive alcohol use, illegal drug use, a prior stroke, Sickle Cell Anemia and prior heart attack.

57. The use of claim 52, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is formulated for intraperitoneal administration.

58. The use of any of claims 52 to 57, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered intravascularly.

59. The use of any of claims 52 to 57, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is formulated for oral administration.

60. The use of claim 59, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is enterically coated.

61. The use of any of claim 52 to 60, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered continuously.

62. The use of any of claims 52 to 61, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is to be administered prior to, simultaneously with or after an ischemic event/crisis.

63. The use of any of claims 52 to 62, wherein the cysteamine, cysteamine derivative, cystamine, cystamine derivative or a pharmaceutically acceptable salt thereof is used to increase adiponectin levels in the subject.