CLAIMS

1. A composition comprising:

(a) glutathione, a glutathione derivative, a glutathione conjugate, or a pharmaceutically-acceptable salt thereof;

(b) an ascorbic acid; and

(c) a bicarbonate,

wherein the molar ratio of (a):(b):(c) is about 0.1-0.5: 0.5-1: 1.

2. The composition of claim 1, wherein the bicarbonate is sodium bicarbonate.

3. The composition of claim 1, wherein the molar ratio of (a):(b):(c) is about 0.4-0.5: 0.5-1: 1.

4. The composition of claim 1, wherein the molar ratio of (a):(b):(c) is about 0.4-0.5: 0.5: 1 or 0.4-0.5: 1: 1.

5. The composition of claim 1, wherein the pH of the composition is about 5.5 to about 10, about 5.5 to about 8, about 6 to about 10, or about 6 to about 8.

6. The composition of claim 1, wherein the reduced glutathione in the composition is more than about 80%, more than about 82%, more than about 84%, more than about 85%, more than about 88%, more than about 90%, more than about 91%, more than about 92%, more than about 93%, more than about 94%, more than about 95%, more than about 96%, or more than about 97% by weight of the total glutathione in the composition after storage of the composition for 4 weeks at about 5° C.

7. The composition of claim 1, wherein the reduced ascorbic acid is more than about 80%, more than about 85%, more than about 86%, more than about 87%, more than about 88%, more than about 89%, or more than about 90% by weight of the total ascorbic acid in the composition after storage of the composition after storage of the composition for 4 weeks at about 5° C.

8. The composition of claim 1, wherein the composition is an aqueous solution.

9. The composition of claim 8, wherein the aqueous solution is constituted from a dry powder.

10. The composition of claim 1, wherein the composition is suitable for administration by inhalation.

11. A method of upregulating mucociliary clearance in a subject suffering from or at risk of impaired mucociliary clearance comprising administering to the subject a composition of claim 1.

12. The method of claim 11, wherein administering said composition decreases mucus viscosity of the subject.

13. The method of claim 11, wherein administering said composition increases ciliary beat frequency of the subject's airway epithelial cells.

14. A method of reducing airway inflammation in a subject suffering from or at risk of airway inflammation comprising administering to the subject a composition of claim 1, wherein administering said composition reduces the subject's fractional exhaled nitric oxide by at least 20%.

15. The method of claim 14, wherein the pulmonary or airway disease or disorder is chronic obstructive pulmonary disease (COPD), pulmonary fibrosis, viral infection, radiation or chemical agent-related airway disease or disorder, acute respiratory distress syndrome (ARDS), ventilator-associated pneumonia, cystic fibrosis, non-cystic fibrosis bronchiectasis, or cystic fibrosis bronchiectasis.

16. The method of claim 14, wherein the subject has received a lung transplant.

17. A method of decreasing mucus viscosity in a subject suffering from or at risk of suffering from increased mucus viscosity comprising administering to the subject a composition of claim 1.

18. A method of enhancing the expression of cystic fibrosis transmembrane receptor (CFTR) in a subject suffering from decreased expression of CFTR comprising administering to the subject a composition of claim 1.

19. The method of claim 18 further comprising administering a CFTR therapy selected from the group consisting of a CFTR amplifer, a CFTR corrector, a CFTR potentiator/modulator, a CFTR RNA modifier, or any combination thereof.

20. The composition of claim 1, wherein the composition after storage at 2-8°C for at least 72 hours comprises any one or more of the following: (a) essentially free of precipitation, (b) comprises less than 4% impurities, (c) maintains a pH of 6.0-7.0, and (d) minimal loss of solubility.

21. The composition of claim 8, wherein the bicarbonate is about 1-30% by weight.

22. The composition of claim 1 which comprises about 0.49 M glutathione, about 0.50 M ascorbic acid, and about 1 M sodium bicarbonate.