CLAIMS

WHAT IS CLAIMED IS:

1. A composition comprising (i) isolated cell-free nucleic acid molecules and (ii) hypotaurine.

2. The composition of claim 1, wherein the hypotaurine reduces transversion of one or more nucleotides of the cell-free nucleic acid molecule.

3. The composition of claim 2, wherein the transversion comprises a purine to pyrimidine point mutation; optionally, wherein the transversion comprises a guanine to thymine point mutation, or vice versa.

4. The composition of any one of the preceding claims, wherein, when the composition is at about 47 ºC for about 8 hours, the composition experiences reduced transversion of one or more nucleotides of the cell-free nucleic acid molecules by at least 20%, 30%, 40%, 50%, or more as compared to a corresponding control composition that lacks hypotaurine.

5. The composition of any one of the preceding claims, wherein:

the hypotaurine is in the composition at a concentration of between 0.1 millimolar and 100 millimolar, between 0.5 millimolar and 50 millimolar; between 1 millimolar and 10 millimolar; between 10 nanomolar and 10 micromolar; 100 nanomolar and 1 micromolar; or between 100 nanomolar and 300 nanomolar; and

the isolated cell-free nucleic acids or derivative thereof is in the composition at a concentration of between 10 nanomolar and 10 micromolar.

6. The composition of any one of the preceding claims, further comprising one or more nucleic acid probes designed to capture one or more of the cell-free nucleic acid molecules from the isolated cell-free nucleic acid molecules.

7. The composition of any one of the preceding claims, wherein the isolated cell-free nucleic acid molecules comprise an appended adapter sequence.

8. The composition of claim 8, wherein the adapter sequence comprises a molecular barcode and/or a sample barcode.

9. The composition of any one of the preceding claims, wherein the isolated cell-free nucleic acid molecules are from a biological sample from a subject.

10. The composition of claim 10, wherein the subject has, or is suspected of having cancer.

11. A method of reducing nucleotide transversions in one or more nucleic acid molecules, comprising adding a heterologous antioxidant moiety to isolated cell-free nucleic acids or a derivative thereof to generate a composition, wherein the heterologous antioxidant molecule is selected from hypotaurine, uracil-DNA glycosylase (UDG), Formamidopyrimidine [fapy]DNA glycosylase (FPG), and catalase.

12. The method of claim 11, wherein, upon subjecting the composition to at about 47 ºC for about 8 hours, the mixture experiences reduced transversion of the one or more nucleotides of the nucleic molecules by at least 20%, 30%, 40%, 50%, or more as compared to a corresponding control composition that lacks the heterologous antioxidant moiety.

13. The method of claim 11 or claim 12, wherein the transversion comprises a purine to pyrimidine point mutation; optionally, wherein the transversion comprises a guanine to thymine point mutation, or vice versa.

14. The method of any one of claims 11-13, wherein:

an amount of the heterologous antioxidant moiety in the composition is between 0.1 millimolar and 100 millimolar, between 0.5 millimolar and 50 millimolar; between 1 millimolar and 10 millimolar; between 10 nanomolar and 10 micromolar; 100 nanomolar and 1 micromolar; or between 100 nanomolar and 300 nanomolar; and

the isolated cell-free nucleic acids or derivative thereof is in the composition at a concentration of between 10 nanomolar and 10 micromolar.

15. The method of any one of claims 11-14, further comprising capturing one or more of the cell-free nucleic acid molecules derivative thereof having a target sequence via one or more nucleic acid probes in the presence of the heterologous antioxidant moiety.

16. The method of any one of claims 11-15, wherein the isolated cell-free nucleic acid molecules comprise an appended adapter sequence.

17. The composition of claim 16, wherein the adapter sequence comprises a molecular barcode and/or a sample barcode.

18. The method of any one of claims 11-17, further comprising, subsequent to adding the heterologous antioxidant moiety, sequencing at least a portion of the cell-free nucleic acid molecules or derivative thereof.

19. The method of any one of the claims 11-18, wherein the cell-free nucleic acids are isolated from a biological sample from a subject.

20. The method of claim 19, wherein the subject has, or is suspected of having cancer.