CLAIMS

What is claimed is:

1. A method for treating or preventing a metabolic disorder, comprising administering an effective amount of an inhibitor of miR-22 to a subject in need thereof.

2. The method of claim 2, wherein the expression and/or activity of miR-22 is reduced in the subject following administration of the inhibitor.

3. The method of claim 1 or 2, wherein the inhibitor of miR-22 is an oligonucleotide-based inhibitor.

4. The method of claim 3, wherein the oligonucleotide-based inhibitor comprises a sequence that is at least about 75%, about 80%, about 85%, about 90%, about 95%, about 96%, about 97%, about 98%, about 99%, or about 100% complementary to a mature sequence of miR-22.

5. The method of claim 3 or 4, wherein the oligonucleotide-based inhibitor comprises deoxynucleotides or ribonucleotides.

6. The method of any one of claims 3-5, wherein the oligonucleotide-based inhibitor is single stranded.

7. The method of any one of claims 3-5, wherein the oligonucleotide-based inhibitor is double stranded.

8. The method of any one of claims 3-7, wherein the oligonucleotide-based inhibitor comprises one or more chemically modified nucleotides.

9. The method of claim 8, wherein the chemically modified nucleotides are locked nucleotides (LNAs).

10. The method of any one of claims 3-9, wherein the oligonucleotide-based inhibitor comprises about 25, about 20, about 15, about 10, about 9, about 8, about 7, about 6, or about 5 or fewer nucleotides.

11. The method of any one of claims 3-10, wherein the oligonucleotide-based inhibitor is conjugated to one or more N-acetylgalactosamine (GalNAc) moieties.

12. The method of any one of claims 3-11, wherein the oligonucleotide-based inhibitor is an antisense oligonucleotide inhibitor.

13. The method of any one of claims 3-11, wherein the oligonucleotide-based inhibitor is a small interfering RNA (siRNA).

14. The method of any one of claims 3-11, wherein the oligonucleotide-based inhibitor is an aptamer.

15. The method of claim 1 or 2, wherein the inhibitor of miR-22 is a peptide-based or protein-based inhibitor.

16. The method of claim 15, wherein the protein-based inhibitor in an antibody or an antigen-binding portion thereof.

17. The method of claim 1 or 2, wherein the inhibitor of miR-22 is a small molecule-based inhibitor.

18. The method of any one of the above claims, wherein the metabolic disorder is obesity.

19. The method of claim 18, wherein the subject is suffering from Prader-Willi Syndrome.

20. The method of claim 18, wherein the subject is suffering from hypercholesterolemia.

21. The method of claim 18, wherein the subject harbors a fat mass and obesity-associated protein (FTO) variant and/or shows an upregulation of FTO expression and/or activity.

22. The method of any one of claims 18-21, wherein the subject is obese and has a body mass index of greater than about 30.

23. The method of any one of claims 18-21, wherein the subject is overweight and has a body mass index of about 25-29.9.

24. The method of any one of claims 18-23, wherein the method induces weight loss.

25. The method of claim 24, wherein the method induces a total weight loss of about 1%, about 5%, about 10%, about 15%, about 20%, or about 25% or more in the subject.

26. The method of any one of claims 18-23, wherein the method prevents weight gain.

27. The method of any one of claims 18-26, wherein the method reduces or prevents the growth of adipose tissue.

28. The method of any one of claims 18-26, wherein the method impairs adipocyte differentiation.

29. The method of any one of the above claims, wherein the metabolic disorder is a fatty liver disease.

30. The method of claim 29, wherein the fatty liver disease is selected from non-alcoholic fatty acid liver disease (NAFLD) or non-alcoholic steatohepatitis (NASH).

31. The method of claim 29 or 30, wherein the method reduces or prevents liver steatosis.

32. The method of any one of claims 29-31, wherein the method reduces or prevents liver fibrosis.

33. The method of any one of claims 1-32, wherein the method reduces the activity and/or expression of fat mass and obesity-associated protein (FTO), ALKB Homologous 5 (ALKBH5), CCAAT/enhancer binding protein alpha (CEBPα), peroxisome proliferator activated receptor gamma (PPARγ), peroxisome proliferator activated receptor alpha (PPARa), ATP citrate lyase (ACLY), PPARγ co-activator-α (PGC1-α), Specific Protein 1 (SP1), Fibroblast Grow Factor 21 (FGF-21), Uncoupled protein 1 (UCP1), DNA Damage Included Transcript 4 (DDIT-4, REDD1), tumor protein p63 (TP63), fibroblast growth factor 1 (FGF1), and/or Methyltransferase like 3 (METTL3).

34. The method of any one of claims 1-33, wherein the method increases the activity and/or expression of phosphatase and tensin homolog (PTEN) and/or tet methylcytosine dioxygenase 2 (TET2).