

CLAIMS

1. A pharmaceutical composition comprising a synthetic isolated saRNA encapsulated in a liposome, wherein the saRNA up-regulates expression of C/EBP α gene or a pharmaceutical composition thereof, wherein the saRNA comprises an antisense strand and a sense strand, wherein the antisense strand comprises a sequence selected from SEQ ID NO: 109 and 93, and the sense strand comprises a sequence selected from SEQ ID NO: 110 and 94, and wherein the liposome comprises 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (POPC), 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (DOPE), cholesteryl-hemisuccinate (CHEMS), and 4-(2-aminoethyl)-morpholino-cholesterol hemisuccinate (MOCHOL).
2. The pharmaceutical composition of claim 1, wherein the molar ratio of POPC:DOPE:CHEMS:MOCHOL is around 6:24:23:47.
3. The pharmaceutical composition of claim 1, wherein the size of the liposome is between about 50 nm to about 150 nm.
4. The pharmaceutical composition of claim 3, wherein the size of the liposome is between 100 nm to about 120 nm.
5. The pharmaceutical composition of claim 1, wherein the antisense strand and/or the sense strand of the saRNA comprises a 3' overhang.
6. The pharmaceutical composition of any one of claims 1 to 5, wherein the saRNA is modified.
7. The pharmaceutical composition of claim 6, wherein the modification is on the sense strand.
8. The pharmaceutical composition of claim 6, wherein the modification is on both the sense strand and the antisense strand.

9. The pharmaceutical composition of claim 1, wherein the saRNA has an antisense strand of SEQ ID NO: 109 and a sense strand of SEQ ID NO: 110.
10. The pharmaceutical composition of claim 1, wherein the saRNA has a concentration of about 2 mg/mL to about 5 mg/mL.
11. The pharmaceutical composition of claim 10, wherein the saRNA has a concentration of about 2.5 mg/mL.
12. The pharmaceutical composition of claim 1, wherein the pharmaceutical composition has a pH between about 7.2 to about 7.8.
13. The pharmaceutical composition of claim 12, wherein the pharmaceutical composition has a pH of about 7.5.
14. The pharmaceutical composition of claim 1, wherein the pharmaceutical composition has a phosphate buffer.
15. The pharmaceutical composition of claim 14, wherein the phosphate buffer comprises disodium hydrogen phosphate, dihydrate and potassium dihydrogen phosphate.
16. The pharmaceutical composition of claim 1, wherein the pharmaceutical composition comprises a cryoprotectant.
17. The pharmaceutical composition of claim 16, wherein the cryoprotectant is sucrose.
18. The pharmaceutical composition of claim 1, wherein the pharmaceutical composition comprises an ionic strength adjuster.
19. The pharmaceutical composition of claim 18, wherein the ionic strength adjuster is potassium chloride.

20. The pharmaceutical composition of claim 1, wherein the pharmaceutical composition is diluted with 0.9% Normal Saline for intravenous use.
21. The pharmaceutical composition of any one of claims 1 to 20 for use in the treatment of hepatocellular carcinoma (HCC).
22. Use of the pharmaceutical composition of any one of claims 1 to 20 in the manufacture of a medicament for the treatment of hepatocellular carcinoma (HCC).
23. The use of claim 22, wherein the HCC is advanced HCC.
24. The use of claim 22, wherein the dose of the pharmaceutical composition is between about 20 to about 160 mg/m².
25. The use of claim 22, wherein the pharmaceutical composition is to be administered once a week for 3 weeks on Day 1, Day 8 and Day 15 by intravenous infusion.
26. The pharmaceutical composition of any one of claims 1 to 20 for use in the treatment of liver fibrosis, liver failure, or nonalcoholic steatohepatitis (NASH).
27. Use of the pharmaceutical composition of any one of claims 1 to 20 in the manufacture of a medicament for the treatment of liver fibrosis, liver failure, or nonalcoholic steatohepatitis (NASH).
28. The pharmaceutical composition of any one of claims 1 to 20 for use in the treatment of type II diabetes or insulin resistance.
29. Use of the pharmaceutical composition of any one of claims 1 to 20 in the manufacture of a medicament for the treatment of type II diabetes or insulin resistance.