CLAIMS

1. An Internal Ribosome Entry Site (IRES) comprising a nucleotide sequence selected from the group consisting of SEQ ID NO: 21, SEQ ID NO: 22 or a combination thereof, preferably a nucleotide sequence as shown in SEQ ID NO: 21.

2. A plasmid vector for making an open reading frame-coding circular mRNA, said plasmid vector comprising elements connected to each other and arranged in a following sequence:

- RNA polymerase promoter,
- 5’ Spacer1,
- 5’ external homology arm,
- 3’ PIE (permuted intron-exon),
- 5’ internal homology arm,
- 5’ Spacer2,
- Internal ribosome entry site (IRES),
- Open reading frame (ORF),
- 3’ Spacer1,
- 3’ internal homology arm,
- 5’ PIE (permuted intron-exon),
- 3’ Spacer2, and
- 3’ external homology arm

wherein the IRES is selected from the group consisting of SEQ ID NO: 21, SEQ ID NO: 22 or a combination thereof.

3. The plasmid vector according to claim 2, wherein the RNA polymerase promoter has a length from 15 to 25 nucleotides, preferably selected from the group consisting of T7 virus RNA polymerase promoter, SP6 virus RNA polymerase promoter, or T3 virus RNA polymerase, more preferably the T7 virus RNA polymerase promoter.

4. The plasmid vector according to claim 2, wherein the 5’ spacer1 has a length from 5 to 15 nucleotides.

5. The plasmid vector according to claim 2, wherein the 5’ external homology arm has a length from 15 to 30 nucleotides, preferably from 15 to 20 nucleotides or 20 to 30 nucleotides, more preferably sequence SEQ ID NO: 4.

6. The plasmid vector according to claim 3, wherein the 3’ PIE (permuted intron-exon) has a length from 100 to 250 nucleotides, preferably obtained from Cyanobacterium anabaena pre-tRNA group I intron gene.

7. The plasmid vector according to claim 2, wherein the 5’ internal homology arm has a length from 15 to 25 nucleotides.

8. The plasmid vector according to claim 2, wherein the 5’ spacer2 has a length from 50 to 100 nucleotides.

9. The plasmid vector according to claim 3, wherein the IRES has a length from 190 to 900 nucleotides, preferably sequence SEQ ID NO: 21.

10. The plasmid vector according to claim 2, wherein the ORF is selected from the group consisting of:

ORF encoding virus spike protein, wherein the ORF encoding virus spike protein is ORF encoding SARS-CoV-2 virus spike protein;

ORF encoding cancer antigen protein, wherein the ORF encoding cancer antigen protein is selected from ORF encoding cancer antigen protein H3K27M, ORF encoding cancer antigen protein PSCA, or ORF encoding cancer antigen protein TROP2;

ORF encoding reprogramming factor protein, wherein the ORF encoding reprogramming factor protein is ORF encoding reprogramming factor protein OSCK;

ORF encoding chimeric antigen receptor protein (CAR protein), wherein the ORF encoding chimeric antigen receptor protein (CAR protein) is ORF encoding CAR protein CD19; or

a combination thereof.

11. The plasmid vector according to claim 2, wherein the 3’ spacer1 has a length from 15 to 25 nucleotides.

12. The plasmid vector according to claim 2, wherein the 3’ internal homology arm has a length from 15 to 25 nucleotides.

13. The plasmid vector according to claim 2, wherein the 5’ PIE (permuted intron-exon) has a length from 100 to 250 nucleotides, preferably obtained from *Cyanobacterium anabaena* pre-tRNA group I intron gene.

14. The plasmid vector according to claim 3, wherein the 3’ spacer2 has a length from 5 to 15 nucleotides.

15. The plasmid vector according to claim 3, wherein the 3’ external homology arm has a length from 15 to 30 nucleotides, preferably from 15 to 25 nucleotides or 25 to 30 nucleotides, more preferably sequence SEQ ID NO: 41.

16. ORF-coding circular mRNA obtained from the plasmid vector according to claim 2.

17. An open reading frame-coding circular mRNA (ORF-coding circular mRNA) obtained from a plasmid vector comprising elements that are connected to each other and arranged in a following sequence:

- 3’ exon
- Internal ribosome entry site (IRES)
- Open reading frame (ORF)
- 5’ exon

wherein the IRES is selected from the group consisting of SEQ ID NO: 21, SEQ ID NO: 22 or a combination thereof.

18. The ORF-coding circular mRNA according to claim 17, wherein the IRES has a length from 190 to 900 nucleotides, preferably sequence SEQ ID NO: 21.

19. The ORF-coding circular mRNA according to claim17, wherein the ORF is selected from the group consisting of:

ORF encoding virus spike protein, wherein the ORF encoding virus spike protein is ORF encoding SARS-CoV-2 virus spike protein;

ORF encoding cancer antigen protein, wherein the ORF encoding cancer antigen protein is selected from ORF encoding cancer antigen protein H3K27M, ORF encoding cancer antigen protein PSCA, or ORF encoding cancer antigen protein TROP2;

ORF encoding reprogramming factor protein, wherein the ORF encoding reprogramming factor protein is ORF encoding reprogramming factor protein OSCK;

ORF encoding chimeric antigen receptor protein (CAR protein), wherein the ORF encoding chimeric antigen receptor protein (CAR protein) is ORF encoding CAR protein CD19; or

a combination thereof.