CLAIMS

1. An ex vivo or in vitro method for site-specific sequence modification of a target genomic DNA region in cells comprising:

transfecting the cells by electroporation with a composition comprising (a) a DNA oligo; (b) a DNA digesting agent encoded on a RNA; and (c) a targeting RNA, wherein the targeting RNA is capped and/or polyadenylated;

wherein the DNA oligo comprises:

(i) a homologous region comprising DNA sequence homologous to the target genomic DNA region; and

(ii) a sequence modification region; and

wherein the genomic DNA sequence is modified specifically at the target genomic DNA region.

2. The method of claim 1, wherein electroporation is flow electroporation using a flow electroporation device.

3. The method of claim 1 or 2, wherein the DNA digesting agent comprises Cas9.

4. The method of any one of claims 1-3, wherein the DNA digesting agent comprises a site-specific nuclease.

5. The method of any one of claims 1-4, wherein the targeting RNA comprises a guide RNA.

6. The method of any one of claims 1-5, wherein the oligo is single-stranded.

7. The method of any one of claims 1-6, wherein the DNA oligo is 10-50 nucleic acids.

8. The method of any one of claims 1-7, wherein the concentration of the DNA oligo in the composition is from about 35 to about 200 μg/mL.

9. The method of any one of claims 1-8, wherein the composition is non-viral.

10. The method of any one of claims 1-9, wherein the cells comprise mammalian cells and wherein the mammalian cells comprise peripheral blood lymphocytes, B cells, expanded T cells, hematopoietic stem cells, or mesenchymal stem cells.

11. The method of claim 10, wherein the cells comprise primary mammalian cells.

12. The method of any one of claims 1-11, wherein the genomic DNA sequence comprises a chronic granulomatous disease-associated gene.

13. The method of any one of claims 1-12, wherein the genomic DNA sequences comprises the *HBB* gene, and wherein the sequence modification is the correction of the genomic DNA that modifies the sixth codon of the *HBB* gene to a glutamic acid codon.

14. The method of claim 12, wherein the genomic DNA sequence comprises the gp91phox gene.

15. The method of any one of claims 1-14, wherein the cells are cells isolated from a patient.

16. The method of claim 15, wherein the cell viability after electroporation is at least 40%.

17. The method of claim 15 or 16, wherein the cells are isolated from the bone marrow of the subject.

18. The method of any one of claims 15-17, wherein the cells comprise stem cells or hematopoietic stem cells.

19. An electroporated cell produced using the method of any one of claims 1-18.

20. Use of the electroporated cell of claim 19 for the manufacture of a medicament for treating a subject having or suspected of having a disease or condition due to a genetic mutation.