Claims

1. A complex comprising:

an oligodeoxynucleotide that comprises humanized K type CpG oligodeoxynucleotide consisting of the nucleotide sequence shown by SEQ ID NO: 1 and poly deoxyadenylate, wherein the poly deoxyadenylate is placed on the 3'-side of the humanized K type CpG oligodeoxynucleotide, and

lentinan.

2. The complex according to claim 1, wherein phosphodiester bonds in the oligodeoxynucleotide are partly or entirely substituted by phosphorothioate bonds.

3. The complex according to claim 2, wherein the phosphodiester bonds in the oligodeoxynucleotide are entirely substituted by phosphorothioate bonds.

4. The complex according to any one of claims 1 to 3, wherein the poly deoxyadenylate has a length of 20 - 60 nucleotides.

5. A complex consisting of:

(i) an oligodeoxynucleotide wherein poly deoxyadenylate having a length of 20 - 60 nucleotides is bound at the 3'-end of an oligodeoxynucleotide consisting of the nucleotide sequence shown by SEQ ID NO: 1, and all of the phosphodiester bonds in the oligodeoxynucleotide are substituted by phosphorothioate bonds; and

(ii) lentinan

6. The complex according to any one of claims 1 to 5, wherein the complex has a triple helix structure.

7. The complex according to any one of claims 1 to 6, wherein the complex has an activity to activate B cells to produce IL-6, and an activity to activate dendritic cells to produce IFN-α.

8. A pharmaceutical composition comprising the complex according to any of claims 1 to 7.

9. The pharmaceutical composition according to claim 8, for use in the prophylaxis or treatment of virus infection, cancer, an allergic disease, or intracellular parasitic protozoan or bacterial infection.

10. The pharmaceutical composition according to claim 9, for use in the prophylaxis or treatment of virus infection.

11. The pharmaceutical composition according to claim 10, wherein the virus infection is RS virus or influenza virus infection.

12. An agent for inducing production of type I and/or type II interferon, comprising the complex according to any one of claims 1 to 7.

13. An immunostimulating agent comprising the complex according to any one of claims 1 to 7.

14. The immunostimulating agent according to claim 13, which is a vaccine adjuvant.

15. An agent for the prophylaxis or treatment of virus infection, cancer, an allergic disease, or intracellular parasitic protozoan or bacterial infection, comprising the complex according to any one of claims 1 to 7.

16. The agent according to claim 15, wherein the virus infection is RS virus or influenza virus infection.

17 A pharmaceutical composition comprising:
(a) the complex according to any one of claims 1 to 7, and (b) an antigen.

18. The composition according to claim 17, for use in the induction of an immune reaction to the antigen.

19. The composition according to claim 18, wherein the antigen is derived from a pathogen.

20. The composition according to claim 19, for use in the prophylaxis or treatment of infection with the pathogen.

21. The composition according to claim 20, wherein the pathogen is a virus.

22. The composition according to claim 21, wherein the virus is an RS virus or influenza virus.

23. Use of the complex according to any of claims 1 to 7, or the pharmaceutical composition according to any one of claims 8 to 11 or 17 to 22 in the manufacture of a medicament for the treatment or prophylaxis of virus infection, cancer, an allergic disease, or intracellular parasitic protozoan or bacterial infection.

24. The use according to claim 23, wherein the disease is virus infection.

25. The use according to claim 24, wherein the virus infection is RS virus or influenza virus infection.