(39). The host cell of (36), wherein the first polynucleotide is operably linked to a sequence that is at least 85% identical to SEQ ID NO: 9 and the second polynucleotide is operably linked to a sequence that is at least 85% identical to SEQ ID NO: 9.

(40). The host cell of (36), wherein the first polynucleotide is operably linked to a sequence that is at least 85% identical to SEQ ID NO: 4 and the second polynucleotide is operably linked to a sequence that is at least 85% identical to SEQ ID NO: 17.

(41). The host cell of (36), wherein the first polynucleotide is operably linked to a sequence that is at least 85% identical to SEQ ID NO: 9 and the second polynucleotide is operably linked to a sequence that is at least 85% identical to SEQ ID NO: 17.

(42). An expression vector comprising an expression cassette, wherein the expression cassette comprises a promoter operably linked to a nucleic acid sequence encoding a polypeptide, and a regulatory sequence that is at least 85% identical to a sequence selected from the group consisting of SEQ ID NOs:3-9, wherein the regulatory sequence is operably linked to the promotor.

(43). The expression vector of (42), wherein the expression vector has a sense strand and an anti-sense strand, and the sense strand comprises a sequence (from 5’ to 3’) that is at least 85% identical to a sequence selected from the group consisting of SEQ ID NOs:3-9.

(44). The expression vector of (42), wherein the expression vector has a sense strand and an anti-sense strand, and the anti-sense strand comprises a sequence (from 5’ to 3’) that is at least 85% identical to a sequence selected from the group consisting of SEQ ID NOs:3-9.

In one aspect, the present disclosure refers to a protein expression vector comprising an isolated polynucleotide molecule comprising a nucleotide sequence selected from the group consisting of SEQ ID NOs: 4, 6, 7, 17, 18, 20, 21, 22 and 23.

In one aspect, the present disclosure refers to a recombinant host cell comprising the vector disclosed herein, wherein the host cell is a Chinese hamster ovary (CHO) cell.

In one aspect, the present disclosure refers to a method of preparing a recombinant host cell which stably expresses a protein, comprising a step of inserting into a Chinese hamster ovary (CHO) cell the vector disclosed herein.

In one aspect, the present disclosure refers to a method of preparing a protein, comprising a step of culturing the recombinant host cell disclosed herein under conditions that allow production of the protein.

In one aspect, the present disclosure refers to a kit comprising the recombinant host cell disclosed herein.

In one aspect, the present disclosure refers to the use of the recombinant host cell disclosed herein in the manufacture of a medicament for treating an autoimmune disease, wherein the autoimmune disease is selected from the group consisting of rheumatoid arthritis and ankylosing spondylitis, and wherein the vector comprises a nucleotide sequence encoding Adalimumab.

Effects of disclosure

In a technical solution, the use of the transcriptional regulatory element WXRE listed in the present disclosure can greatly increase the expression amount of a heterologous protein and has great contribution to the production of mammalian proteins.

In some technical solutions, the expression amount of a heterologous protein is increased by about or at least 10%, 20%, 30%, 40%, 50%, 60%, 70%, or 80%. In some technical solutions, the expression amount of a heterologous protein is increased up to 80%.

In another technical solution, the use of the transcriptional regulatory element WXRE listed in the present disclosure can enable a heterologous protein to still maintain its biological

CLAIMS

1. A protein expression vector comprising an isolated polynucleotide molecule comprising a nucleotide sequence selected from the group consisting of SEQ ID NOs: 4, 6, 7, 17, 18, 20, 21, 22 and 23.

2. The vector according to claim 1, wherein the vector is a recombinant expression vector.

3. The vector according to claim 1 or 2, further comprising a nucleotide sequence selected from the group consisting of (i) to (iv):

(i) a sequence of SEQ ID NO: 13;

(ii) a reverse complementary sequence of the sequence of SEQ ID NO: 13;

(iii) a reverse complementary sequence of a sequence capable of hybridizing with the sequence of (i) or (ii) under a high stringency hybridization condition or a very high stringency hybridization condition; and

(iv) a sequence having at least 90% sequence identity, alternatively at least 95% sequence identity, preferably at least 97% sequence identity, more preferably at least 98% sequence identity, most preferably at least 99% sequence identity with the sequence of (i) or (ii).

4. The vector according to any of claims 1-3, further comprising a CMV promoter; preferably, the CMV promoter comprises a nucleotide sequence of SEQ ID NO: 16, or the CMV promoter comprises a sequence having at least 90% sequence identity, alternatively at least 95% sequence identity, preferably at least 97% sequence identity, more preferably at least 98% sequence identity, most preferably at least 99% sequence identity with the sequence of SEQ ID NO: 16.

5. The vector according to claim 4, comprising a combination of (1) a sequence of SEQ ID NO: 4; (2) a sequence of SEQ ID NO: 13 or a sequence having 90% identity thereto; and (3) a sequence of SEQ ID NO: 16 or a sequence having 90% identity thereto.

6. The vector according to any of claims 1-5, further comprising one or more genes encoding one or more proteins.

7. The vector according to claim 6, wherein the protein is selected from a group consisting of an antibody, a fusion protein, an enzyme, a soluble protein, a membrane protein, a structural protein, a ribosome protein, a zymogen, a cell surface receptor protein, a transcriptional regulatory protein, a translational regulatory protein, a chromatin protein, a hormone, a cell cycle regulatory protein, a G protein, a neuroactive peptide, an immunomodulatory protein, a blood component protein, an ion gate protein, a heat shock protein, dihydrofolate reductase, an antibiotic resistance protein, a functional fragment of any one of the proteins, an epitope fragment of any one of the proteins, and any combination thereof.

8. A recombinant host cell comprising the vector according to any of claims 1-7, wherein the host cell is a Chinese hamster ovary (CHO) cell.

9. A method of preparing a recombinant host cell which stably expresses a protein, comprising

a step of inserting into a Chinese hamster ovary (CHO) cell the vector according to any of claims 1-7.

10. A method of preparing a protein, comprising a step of culturing the recombinant host cell according to claim 8 under conditions that allow production of the protein.

11. A kit comprising the recombinant host cell according to claim 8.

12. Use of the recombinant host cell according to claim 8 in the manufacture of a medicament for treating an autoimmune disease, wherein the autoimmune disease is selected from the group consisting of rheumatoid arthritis and ankylosing spondylitis, and wherein the vector comprises a nucleotide sequence encoding Adalimumab.