

**Claims:**

1. A nucleoprotein complex suitable for use in modifying a target nucleic acid sequence comprising (A) a targeting nucleic acid and (B) a modular polypeptide component, wherein said targeting nucleic acid comprises:

(i) a targeting nucleic acid element (TE) complementary to a region of the target;  
 (ii) a recognition element which specifically interacts with a nucleic acid recognition module of said modular polypeptide component and

(iii) a connecting sequence which links said targeting element and said recognition element;

and said modular polypeptide component comprises as linked, separate functional modules:

(a) said nucleic acid recognition module which is devoid of enzymic activity;  
 (b) a DNA-binding domain (DBD) for assisting in melting and/or unwinding of a double helix of the target, wherein the DBD recognises a predetermined sequence in the target, module (a) and said DBD not being naturally found in linkage; and

(c) an effector component for use in modifying the target whereby site-specific modification directed by said TE and DBD will occur;

wherein module (b) is joined to module (a) and module (c) respectively.

2. A nucleoprotein complex as claimed in claim 1, wherein module (b) is joined to module (a) by a first linker and module (b) is joined to module (c) by a second linker.

3. A nucleoprotein complex as claimed in claim 1 or claim 2, wherein said targeting nucleic acid is an RNA.

4. A nucleoprotein complex as claimed in any one of claims 1 to 3, wherein said recognition element of the targeting nucleic acid is an RNA scaffold (RS) which binds an RNA scaffold binding domain (RSBD) providing said module (a) of the modular polypeptide component.

5. A nucleoprotein complex as claimed in claim 4, comprising as said component (A) a wholly nucleic acid component (NAC) and (B) a modular polypeptide component, wherein the NAC comprises:

(i) a targeting element (TE) complementary to a region of the target;  
 (ii) an RNA scaffold (RS) which specifically binds to an RNA scaffold binding domain (RSBD) of said modular polypeptide component; and  
 (iii) a connecting sequence which links said TE and the RS;

and said modular polypeptide component comprises as linked, separate functional modules:

- (a) said RSBD;
- (b) said DNA-binding domain linked to (a) which recognises a pre-determined sequence in the target, module (a) and said DBD not being naturally found in linkage;
- (c) an effector component linked to (b) for use in modifying the target, whereby site specific modification directed by said TE and said DBD will occur; and
- (d) optionally, or if required, a first linker and/or a second linker linking said DBD to said effector component and the RSBD respectively.

6. A nucleoprotein complex as claimed in claim 4 or claim 5, wherein said targeting nucleic acid or said NAC provides two or more RNA scaffolds, either the same or different.

7. A nucleoprotein complex as claimed in any one of claims 1 to 6, wherein said DBD:

- (i) is a polypeptide sequence of no more than 70-75 amino acid residues, optionally wherein the DBD is no more than a 30 mer, no more than a 25 mer, no more than a 20mer; and/or

- (ii) said DBD binds a predetermined sequence of 3-6 nucleotides.

8. A nucleoprotein complex as claimed in claim 7, wherein said DBD is a polypeptide sequence of no more than a 15mer.

9. A nucleoprotein complex as claimed in any one of claims 1 to 8, wherein said DBD is capable of binding to more than one predetermined sequence.

10. A nucleoprotein complex as claimed in any one of claims 1 to 9, wherein said modular polypeptide component further comprises a nuclear localization signal (NLS) and /or organelle localization signal, wherein said NLS and /or organelle localization signal is provided at the N- or C-terminus optionally connected to an additional sequence to aid detection.

11. A nucleoprotein complex as claimed in any one of the preceding claims, wherein said effector component is selected from (i) an endonuclease for producing double-stranded breaks or a Fok 1 nuclease domain (ii) a nickase (iii) a transcription activator (iv) a transcriptional repressor (v) an epigenetic modulator enzyme (vii) a recombinase (viii) a transposase (ix) an integrase and (x) a nucleobase modifying enzyme construct.

12. A nucleic acid or combination of nucleic acids for provision of one or more nucleoprotein complexes as claimed in any of the preceding claims in a host cell.
13. A method for modifying one or more target nucleic acid sequences employing one or more nucleoprotein complexes as claimed in any one of claims 1 to 11 or one or more nucleic acids for provision thereof in a host cell with the proviso that the method is not a method of modifying the germ line identity of a human being or method of treatment practised on the human or animal body.
14. Use of a combination of (i) at least one modular polypeptide component for a nucleoprotein complex according to any one of claims 1 to 11, or a polynucleotide encoding the same and (ii) one or more targeting nucleic acids as defined in claim 1 which can link with said polypeptide component(s), or one or more polynucleotides encoding the same, in the manufacture of a medicament for therapeutic treatment.