THAT WHICH IS CLAIMED IS:

1. An engineered protein comprising at least two different polypeptides, wherein one of the at least two different polypeptides is a first CRISPR-Cas effector polypeptide that is a first portion of a first Type V CRISPR-Cas effector protein and the first CRISPR-Cas effector polypeptide is devoid of a nuclease domain; and wherein another of the least two different polypeptides is a heterologous polypeptide that is heterologous to the first Type V CRISPR-Cas effector protein and is not a portion of a Type V CRISPR-Cas effector protein.

~~2. The engineered protein of claim 1, wherein the heterologous polypeptide has a length of about 10 to about 200 amino acids and/or the first CRISPR-Cas effector polypeptide has a length of about 100 to about 400 amino acids, optionally wherein the heterologous polypeptide has a length of about 140 to about 160 amino acids and/or the first CRISPR-Cas effector polypeptide has a length of about 250 to about 350 amino acids.~~

~~3.~~2. The engineered protein of claim 1~~ or 2~~, wherein the heterologous polypeptide comprises a first nuclease domain or a portion thereof that is heterologous to the first CRISPR-Cas effector polypeptide.

~~4.~~3. The engineered protein of ~~any one of claims 1-3~~claim 1, wherein the heterologous polypeptide comprises a target strand nickase domain or a portion thereof~~, optionally wherein the heterologous polypeptide comprises a target strand specific nickase domain, a nontarget strand specific nickase domain, or a target and nontarget strand nickase domain~~.

~~5.~~4. The engineered protein of ~~any one of claims 1-4~~claim 1, further comprising a second CRISPR-Cas effector polypeptide that comprises a second nuclease domain or a portion thereof.~~, optionally wherein the first CRISPR-Cas effector polypeptide and the second CRISPR-Cas effector polypeptide are non-continuous (i.e., are separated from each (optionally by at least 10, 50, 100, or more amino acids) and are not directly attached to each other)~~

6.5. The engineered protein of claim 54, wherein the heterologous polypeptide is heterologous to the second CRISPR-Cas effector polypeptide.

7.6. The engineered protein of claim 45 or 6, wherein the first and second CRISPR-Cas effector polypeptides are each a portion (e.g., a different portion) of the same CRISPR-Cas effector protein.

8. The engineered protein of any one of claims 5-7, wherein the second nuclease domain or a portion thereof is a nontarget and target strand nickase domain or a portion thereof.

9. The engineered protein of any one of claims 5-8, wherein the second nuclease domain is active.

10. The engineered protein of any one of claims 5-8, wherein the second nuclease domain is inactive.

11.7. The engineered protein of any one of claims 1-10claim 1, wherein the heterologous polypeptide comprises a HNH domain, optionally wherein the HNH domain comprises a mutation that modifies the activity of the HNH domain (e.g., a H840A mutation).

12.8. The engineered protein of any one of claims 5-11claim 5, wherein the first and second CRISPR-Cas effector polypeptides are each a portion of a first CRISPR-Cas effector protein and the heterologous polypeptide is between and/or linked to (e.g., directly or indirectly) two amino acids that are two consecutive or nonconsecutive amino acids of the first CRISPR-Cas effector protein.

13.9. The engineered protein of claim 128, wherein the heterologous polypeptide is positioned in the engineered protein in a location that corresponds to an interdomain linker region of the first CRISPR-Cas effector protein.

14.10. The engineered protein of any one of claims 1-13claim 1, wherein the heterologous polypeptide comprises an amino acid sequence having at least 70%, 75%, 80%, 85%,

90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to one or more of **SEQ ID NOs:1 or 169-174**~~, optionally wherein the heterologous polypeptide comprises an amino acid sequence of any one of **SEQ ID NOs:1 or 169-174**~~.

~~15. The engineered protein of any one of claims 5-14, wherein the engineered protein comprises, in the amino terminal to carboxy terminal direction, the first CRISPR-Cas effector polypeptide, the heterologous polypeptide, and the second CRISPR-Cas effector polypeptide, optionally wherein the second CRISPR-Cas effector polypeptide has a length of about 800 to about 1,100 amino acids (e.g., about 900 to about 950 or 1,000 amino acids).~~

~~16.~~11. The engineered protein of ~~any one of claims 1-15~~claim 1, further comprising all or a portion of a wedge domain, a Rec1 domain, a Rec2 domain, a PAM-interacting domain, a RuvC domain, a bridge helix, and/or a Nuc domain of the first Type V CRISPR-Cas effector protein~~, optionally wherein the engineered protein comprises all or a portion of a wedge domain, a Rec1 domain, a Rec2 domain, a PAM-interacting domain, a RuvC domain, a bridge helix, and/or a Nuc domain of a Cas12a or Cas12b~~.

~~17.~~12. The engineered protein of claim ~~16~~11, wherein the engineered protein comprises the Rec1 domain and the Rec2 domain and the heterologous polypeptide is between the Rec1 domain and the Rec2 domain.

~~18. The engineered protein of any one of claims 1-17, wherein the engineered protein is devoid of at least a portion of the first Type V CRISPR-Cas effector protein, optionally wherein the engineered protein is devoid of at least a portion of Cas12a or Cas12b.~~

~~19. The engineered protein of any one of claims 5-18, further comprising a first linker between the first CRISPR-Cas effector polypeptide and the heterologous polypeptide and/or a second linker between the heterologous polypeptide and the second CRISPR-Cas effector polypeptide.~~

~~20. The engineered protein of claim 19, wherein the first linker and/or the second linker comprises 1 to 10 amino acids, optionally wherein the first linker and/or the second linker comprises 1, 2, 3, or 4 amino acids.~~

~~21. The engineered protein of claim 19 or 20, wherein the first linker and/or second linker comprises glycine and/or serine.~~

~~22.~~13. The engineered protein of ~~any one of claims 1-21~~claim 1, wherein the engineered protein comprises an amino acid sequence having about 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to the amino acid sequence of a wild-type CRISPR-Cas effector protein~~, optionally wherein the engineered protein comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:50-66 or 151**~~.

~~23.~~14. The engineered protein of ~~any one of claims 1-22~~claim 1, wherein the engineered protein comprises an amino acid sequence having about 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:2-17, 125-132, or 157-168**~~, optionally wherein the engineered protein comprises an amino acid sequence of any one of **SEQ ID NOs:2-17, 125-132, or 157-168**~~.

~~24. The engineered protein of any one of claims 1-23, wherein the engineered protein is a nuclease, optionally wherein the engineered protein is a target strand nickase, a nontarget strand nickase, or a target and nontarget strand nickase.~~

~~25. The engineered protein of any one of claims 1-24, wherein the engineered protein has increased efficiency in nicking the target strand and/or nontarget strand of a target nucleic acid compared to a CRISPR-Cas effector protein (e.g., a wild-type CRISPR-Cas effector protein and/or a protein having a sequence of one of **SEQ ID NOs:50-66 or 151**).~~

~~26. An engineered protein comprising:~~

a first nuclease domain, wherein the first nuclease domain is a target strand nickase domain or a portion thereof, wherein the first nuclease domain is not a Type V nuclease domain or a portion thereof; and

a first CRISPR-Cas effector polypeptide that is a portion of a Type V CRISPR-Cas effector protein.

27. The engineered protein of claim 26, wherein the first nuclease domain is a target strand specific nickase domain or a target and nontarget strand nickase domain.

28. The engineered protein of claim 27 or 28, further comprising a second nuclease domain, optionally wherein the second nuclease domain is a nontarget and target strand nickase domain or a portion thereof.

29. The engineered protein of claim 28, wherein the second nuclease domain is active.

30. The engineered protein of claim 28, wherein the second nuclease domain is inactive.

31. The engineered protein of any one of claims 26-30, wherein the first nuclease domain comprises a HNH domain, optionally wherein the HNH domain comprises an inactivating mutation (e.g., a H840A mutation).

32. The engineered protein of one of claims 28-31, wherein the first CRISPR-Cas effector polypeptide and second nuclease domain are each a portion of a first CRISPR-Cas effector protein and the first nuclease domain is between and/or linked to (e.g., directly or indirectly) two consecutive or nonconsecutive amino acids of the first CRISPR-Cas effector protein.

33. The engineered protein of claim 33, wherein the first nuclease domain is positioned in the engineered protein in a location that corresponds to an interdomain linker region of the first CRISPR-Cas effector protein.

34. The engineered protein of any one of claims 26-33, wherein the first nuclease domain comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to one or more of **SEQ ID NOs:1**

or 169-174, optionally wherein the first nuclease domain comprises an amino acid sequence of any one of **SEQ ID NOs:1 or 169-174**.

35. The engineered protein of any one of claims 26-34, further comprising, in the amino terminal to carboxy terminal direction, the first CRISPR-Cas effector polypeptide, the first nuclease domain, and the second nuclease domain.

36. The engineered protein of any one of claims 26-35, further comprising all or a portion of a wedge domain, a Rec1 domain, a Rec2 domain, a PAM-interacting domain, a RuvC domain, a bridge helix, and/or a Nuc domain of the Type V CRISPR-Cas effector protein, optionally wherein the engineered protein comprises all or a portion of a wedge domain, a Rec1 domain, a Rec2 domain, a PAM-interacting domain, a RuvC domain, a bridge helix, and/or a Nuc domain of a Cas12a or Cas12b

37. The engineered protein of claim 36, wherein the engineered protein comprises the Rec1 domain and the Rec2 domain and the first nuclease domain is between the Rec1 domain and the Rec2 domain.

38. The engineered protein of any one of claims 26-37, wherein the engineered protein is devoid of at least a portion of the Type V CRISPR-Cas effector protein, optionally wherein the engineered protein is devoid of at least a portion of Cas12a or Cas12b.

39. The engineered protein of any one of claims 28-38, further comprising a first linker between the first CRISPR-Cas effector polypeptide and the first nuclease domain and/or a second linker between the first nuclease domain and the second nuclease domain.

40. The engineered protein of claim 39, wherein the first linker and/or the second linker comprises 1 to 10 amino acids, optionally wherein the first linker and/or the second linker comprises 1, 2, 3, or 4 amino acids.

41. The engineered protein of claim 39 or 40, wherein the first linker and/or second linker comprises glycine and/or serine.

~~42. The engineered protein of any one of claims 26-41, wherein the engineered protein comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to a wild-type CRISPR-Cas effector protein, optionally wherein the engineered protein comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:50-66 or 151**.~~

~~43. The engineered protein of any one of claims 26-42, wherein the engineered protein comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:2-17, 125-132, or 157-168**, optionally wherein the engineered protein comprises an amino acid sequence of any one of **SEQ ID NOs:2-17, 125-132, or 157-168**.~~

~~44. The engineered protein of any one of claims 26-42, wherein the engineered protein is a nuclease, optionally wherein the engineered protein is a target strand nickase, a nontarget strand nickase, or a target and nontarget strand nickase.~~

~~45. The engineered protein of any one of claims 26-44, wherein the engineered protein has increased efficiency in nicking the target strand and/or nontarget strand of a target nucleic acid compared to a CRISPR-Cas effector protein (e.g., a wild-type CRISPR-Cas effector protein and/or a protein having a sequence of one of **SEQ ID NOs:50-66 or 151**).~~

~~46. An engineered protein comprising an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:2-17, 125-132, or 157-168**, optionally wherein the engineered protein has an amino acid sequence of any one of **SEQ ID NOs:2-17, 125-132, or 157-168**.~~

~~47.~~15. An engineered protein comprising:

a first polypeptide that is a first portion of a first Type V CRISPR-Cas effector protein;

a second polypeptide that is a second portion of the first Type V CRISPR-Cas effector protein; and

a heterologous polypeptide that is heterologous to the first Type V CRISPR-Cas effector protein,

wherein the heterologous polypeptide is between the first and second polypeptides and the heterologous polypeptide is positioned in the engineered protein in a location that corresponds to an interdomain linker region of the first Type V CRISPR-Cas effector protein.

~~48.~~16. The engineered protein of claim ~~47~~15, wherein the interdomain linker region comprises one or more amino acids of amino acid residues 283-293 of **SEQ ID NO:50** or of corresponding amino acid residues for a sequence that is optimally aligned to **SEQ ID NO:50** ~~(e.g., amino acid residues that correspond to amino acid residues 283-293 when a sequence (e.g., **SEQ ID NO:52**) is optimally aligned to **SEQ ID NO:50**)~~.

~~49.~~17. The engineered protein of claim ~~47 or 48~~15, wherein first polypeptide comprises all or a portion of a wedge domain and/or a Rec1 domain of the first Type V CRISPR-Cas effector protein; and/or

the second polypeptide comprises all or a portion of a wedge domain, a Rec2 domain, a PAM-interacting domain, a RuvC domain, a bridge helix, and/or a Nuc domain of the first Type V CRISPR-Cas effector protein.

~~50.~~18. The engineered protein of claim ~~49~~17, wherein the engineered protein comprises the Rec1 domain and the Rec2 domain and the heterologous polypeptide is between the Rec1 domain and the Rec2 domain.

~~51. The engineered protein of any one of claims 47-50, wherein the engineered protein is devoid of at least a portion of the first Type V CRISPR-Cas effector protein (e.g., Cas12a or Cas12b).~~

~~52.~~19. The engineered protein of ~~any one of claims 47-51~~claim 15, wherein the heterologous polypeptide comprises a target strand nickase domain or a portion thereof~~, optionally wherein the heterologous polypeptide comprises a target strand specific nickase domain, a nontarget strand specific nickase domain, or a target and nontarget strand nickase domain~~.

~~53.~~20. The engineered protein of ~~any one of claims 47-52~~claim 15, wherein the second polypeptide comprises a nuclease domain or a portion thereof~~, optionally wherein the nuclease domain or portion thereof is a nontarget and target strand nickase domain or a portion thereof (e.g., a RuvC domain or portion thereof)~~.

~~54. The engineered protein of any one of claims 53, wherein the nuclease domain is active.~~

~~55. The engineered protein of any one of claims 53, wherein the nuclease domain is inactive.~~

~~56. The engineered protein of any one of claims 47-55, wherein the heterologous polypeptide comprises a HNH domain, optionally wherein the HNH domain comprises a mutation that modifies the activity of the HNH domain (e.g., a H840A mutation).~~

~~57. The engineered protein of any one of claims 47-56, wherein the heterologous polypeptide comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to one or more of **SEQ ID NOs:1 or 169-174**, optionally wherein the heterologous polypeptide comprises an amino acid sequence of any one of **SEQ ID NOs:1 or 169-174**.~~

~~58. The engineered protein of any one of claims 47-57, further comprising a first linker between the first polypeptide and the heterologous polypeptide and/or a second linker between the heterologous polypeptide and the second polypeptide.~~

~~59. The engineered protein of claim 58, wherein the first linker and/or the second linker comprises 1 to 10 amino acids, optionally wherein the first linker and/or the second linker comprises 1, 2, 3, or 4 amino acids.~~

~~60. The engineered protein of claim 58 or 59, wherein the first linker and/or second linker comprises glycine and/or serine.~~

61. The engineered protein of any one of claims 47-60, wherein the engineered protein comprises an amino acid sequence having about 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to the amino acid sequence of a wild-type CRISPR-Cas effector protein, optionally wherein the engineered protein comprises an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:50-66 or 151**.

62. The engineered protein of any one of claims 47-61, wherein the engineered protein comprises an amino acid sequence having about 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or more sequence identity to any one of **SEQ ID NOs:2-17, 125-132, or 157-168**, optionally wherein the engineered protein comprises an amino acid sequence of any one of **SEQ ID NOs:2-17, 125-132, or 157-168**.

63. The engineered protein of any one of claims 47-62, wherein the engineered protein is a nuclease, optionally wherein the engineered protein is a target strand nickase, a nontarget strand nickase, or a target and nontarget strand nickase.

64. The engineered protein of any one of claims 47-63, wherein the engineered protein has increased efficiency in nicking the target strand and/or nontarget strand of a target nucleic acid compared to a CRISPR-Cas effector protein (e.g., a wild-type CRISPR-Cas effector protein and/or a protein having a sequence of one of **SEQ ID NOs:50-66 or 151**).

65. A composition (e.g., a base editing composition) or system comprising:
the engineered protein of any one of claims 1-64;
a guide nucleic acid (e.g., a guide RNA), and
optionally a deaminase,
optionally wherein the engineered protein, guide nucleic acid, and optionally deaminase form a complex or are comprised in a complex.

66. A complex comprising:
the engineered protein of any one of claims 1-64;
a guide nucleic acid (e.g., a guide RNA); and

optionally a deaminase.

67. A nucleic acid molecule comprising a nucleotide sequence encoding the engineered protein of any one of claims 1-64.

68. An expression cassette or vector comprising the nucleic acid molecule of claim 66 or a nucleotide sequence encoding the engineered protein of any one of claims 1-64.

69. A method of modifying a target nucleic acid, the method comprising:
contacting the target nucleic acid with:
the engineered protein of any one of claims 1-64, and
a guide nucleic acid (e.g., a guide RNA),
optionally wherein the engineered protein and the guide nucleic acid form a complex or are comprised in a complex, thereby modifying the target nucleic acid.

70. The method of claim 68, wherein the method has increased efficiency in modifying the target nucleic acid and/or in nicking the target strand and/or nontarget strand of a target nucleic acid compared to the efficiency of a control method (e.g., a method comprising contacting the target nucleic acid with a wild-type CRISPR-Cas effector protein).

71. A method of increasing the efficiency of modifying a target nucleic acid, the method comprising:
a. contacting the target nucleic acid with:
b. the engineered protein of any one of claims 1-64, and
c. a guide nucleic acid (e.g., a guide RNA),
d. optionally wherein the engineered protein and the guide nucleic acid form a complex or are comprised in a complex, thereby modifying the target nucleic acid, thereby increasing the efficiency of modifying the target nucleic acid compared to a control method (e.g., a method that comprises contacting the target nucleic acid with a wild-type CRISPR-Cas effector protein and that is devoid of the engineered protein).

72. The method of claim 68-70, wherein the target nucleic acid is present in a eukaryotic cell, optionally wherein the target nucleic acid is present in a plant cell.

73. The method of any one of claims 68-71, wherein the engineered protein provides a different editing profile for the target nucleic acid compared to the editing profile of the target nucleic acid for a wild-type CRISPR-Cas effector protein.

74. The method of any one of claims 68-72, wherein the engineered protein provides a different cleavage pattern for the target nucleic acid compared to the cleavage pattern of the target nucleic acid for a wild-type CRISPR-Cas effector protein.