

CLAIMS

1. A mutant Tn5 transposase having transposase activity, wherein said mutant Tn5 transposase comprises all of SEQ ID NO:1 or SEQ ID NO:11 except for:
 - (a) mutations at one or more positions corresponding to positions 214 and 338 of SEQ ID NO:1 or SEQ ID NO:11, and optionally
 - (b) mutations at one or more positions corresponding to positions 54, 56, 212, 251, and 372 of SEQ ID NO:1 or SEQ ID NO:11.
2. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises all of SEQ ID NO:1 or SEQ ID NO:11 except for:
 - (a) mutations at one or more positions corresponding to positions 214 and 338 of SEQ ID NO:1 or SEQ ID NO:11,
 - (b) mutations at one or more positions corresponding to positions 212 and 251 of SEQ ID NO:1 or SEQ ID NO:11, and optionally
 - (c) mutations at one or more positions corresponding to positions 54, 56, and 372 of SEQ ID NO:1 or SEQ ID NO:11.
3. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises all of SEQ ID NO:1 or SEQ ID NO:11 except for:
 - (a) mutations at one or more positions corresponding to positions 212, 214, and 338 of SEQ ID NO:1 or SEQ ID NO:11, and optionally
 - (b) mutations at one or more positions corresponding to positions 54, 56, 251, and 372 of SEQ ID NO:1 or SEQ ID NO:11.
4. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises arginine at the position corresponding to position 214 of SEQ ID NO:1 or SEQ ID NO:11.
5. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises valine at the position corresponding to position 338 of SEQ ID NO:1 or SEQ ID NO:11.

6. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises arginine at the position corresponding to position 251 of SEQ ID NO:1 or SEQ ID NO:11.
7. A fusion protein comprising the mutant Tn5 transposase of claim 1 and a polypeptide fusion domain.
8. The fusion protein of claim 7, wherein the polypeptide fusion domain is fused to the N-terminus of the mutant Tn5 transposase.
9. The fusion protein of claim 7, wherein the polypeptide fusion domain is fused to the C-terminus of the mutant Tn5 transposase.
10. The fusion protein of claim 7, wherein the polypeptide fusion domain comprises a tag to increase solubility.
11. The fusion protein of claim 7, wherein the polypeptide fusion domain comprises a domain selected from the group consisting of maltose binding protein (MBP), elongation factor Ts (Tsf), 5-methyl cytosine binding domain, and protein A.
12. A kit for performing an in vitro transposition reaction, wherein the kit comprises a transposome complex, wherein the transposome complex comprises the mutant Tn5 transposase of claim 1 and a polynucleotide, wherein the 3' portion of the polynucleotide comprises a transposon end sequence.
13. The mutant Tn5 transposase of claim 3, wherein the mutant Tn5 transposase comprises a substitution at the position corresponding to position 212 of SEQ ID NO:1 or SEQ ID NO:11.
14. The mutant Tn5 transposase of claim 13, wherein the mutant Tn5 transposase comprises arginine at the position corresponding to position 212 of SEQ ID NO:1 or SEQ ID NO:11.

15. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises all of SEQ ID NO:1 or SEQ ID NO:11 except for:
- (a) mutations at one or more positions corresponding to positions 212, 214, 251, and 338 of SEQ ID NO:1 or SEQ ID NO:11, and
 - (b) mutations at one or more positions corresponding to positions 54, 56, and 372 of SEQ ID NO:1 or SEQ ID NO:11.
16. The mutant Tn5 transposase of claim 15, wherein the mutant Tn5 transposase comprises arginine, arginine, arginine, and valine, respectively, at the positions corresponding to positions 212, 214, 251, and 338 of SEQ ID NO:1 or SEQ ID NO:11.
17. The fusion protein of claim 11, wherein the polypeptide fusion domain comprises elongation factor Ts (Tsf) and wherein the mutant Tn5 transposase comprises arginine, arginine, arginine, and valine, respectively, at the positions corresponding to positions 212, 214, 251, and 338 of SEQ ID NO:1 or SEQ ID NO:11.
18. The fusion protein of claim 7, wherein said fusion protein comprises SEQ ID NO:26.
19. The mutant Tn5 transposase of claim 1, wherein said mutant Tn5 transposase comprises all of SEQ ID NO:1 or SEQ ID NO:11 except for mutations at positions corresponding to positions 54, 56, 212, 214, 251, 338, and 372 of SEQ ID NO:1 or SEQ ID NO:11.
20. The mutant Tn5 transposase of claim 1, wherein the mutant Tn5 transposase comprises SEQ ID NO:26.