

WHAT IS CLAIMED IS:

1. A method, comprising
stretching a polynucleotide over a substrate comprising a plurality of equally spaced cleavage regions comprising a plurality of transposases,
cleaving the polynucleotide with two or more of the plurality of transposases to form a plurality of polynucleotide fragments, and
separating, within the plurality of polynucleotide fragments, a population of longer polynucleotide fragments from a population of shorter polynucleotide fragments.
2. The method of claim 1, wherein the polynucleotide is double-stranded and the cleaving comprises forming complementary ends at a cleavage point and adding adapters to the complementary ends.
3. The method of claim 2, wherein the adapters added to the complementary ends are not connected to each other.
4. The method of claim 2 wherein the adapters added to the complementary ends are connected to each other.
5. The method of claim 2, wherein the cleavage regions comprise two types of cleavage regions, and the plurality of equally spaced cleavage regions alternate between the two types of cleavage regions.
6. The method of claim 5, wherein a first type of the two types of cleavage region comprises a first type of adapter and a second type of the two types of cleavage region does not comprise the first type of adapter.
7. The method of claim 6 wherein the second type of cleavage region comprises a second type of adapter and the first type of cleavage region does not comprise the second type of adapter.
8. The method of any one of claims 1 through 7, wherein the substrate comprises trenches alternating with interstices, and the cleavage regions comprise surfaces of the trenches and surfaces of the interstices.
9. The method of any one of claims 1 through 7, wherein the substrate comprises posts alternating with interstices, and the cleavage regions comprise surfaces of the posts and surfaces of the interstices.
10. The method of any one of claims 1 through 7, wherein the substrate comprises wells alternating with interstices, and the cleavage regions comprise surfaces of the wells and surfaces of the interstices.
11. The method of claim 4, wherein the adapters comprise a hairpin loop.

12. The method of any one of claims 1 through 11, wherein the step comprises bi-directional molecular combing.
13. A method, comprising
extending an end of a polynucleotide through a pore of a membrane, wherein the polynucleotide is attached to a bead, the pore is narrower than the bead, and a side of the membrane opposite the bead comprises a nuclease, and
cleaving the polynucleotide with the nuclease.
14. The method of claim 13, wherein the extending comprises electrophoresing.
15. The method of claims 13 or 14, wherein the polynucleotide is double-stranded.
16. The method of any one of claims 13 through 15 wherein the nuclease comprises a transposase.
17. The method of claims 13 or 14, wherein the polynucleotide is single-stranded.
18. The method of any one of claims 13 through 17, wherein the cleaving comprises forming a cleaved end and further comprising adding an adapter to the cleaved end.
19. The method of claim 18, wherein the polynucleotide is double-stranded and the cleaving comprises forming complementary ends and adding adapters to the complementary ends, wherein the adapters are not connected to each other.
20. The method of claim 18, wherein the polynucleotide is double-stranded and the cleaving comprises forming complementary ends and adding adapters to the complementary ends, wherein the adapters are connected to each other.
21. The method of claim 20, wherein the adapters comprise a hairpin loop.
22. The method of any one of claims 13 through 21, further comprising releasing the polynucleotide from the bead.
23. The method of any one of claims 13 through 22, further comprising synthesizing a copy of a strand of the polynucleotide.